

AIR POWER

History

SPRING 2005 - Volume 52, Number 1

Ozark Lead is out of the Aircraft <i>W. Howard Plunkett</i>	4
The Question of British Influence on U.S. Tactical Air Power in World War II <i>Paul Johnston</i>	16
Keith Ferris: Life, Flight and Art Eyewitness to Seventy-five Years of Air Force History <i>Keith Ferris</i>	34
Desert Storm and the Triumph of Joint Warfare Planning <i>Don D. Chipman</i>	52
Book Reviews	66
<i>Images of Three: A History of the First British Aeroplane Unit, Volume I, Pre-1918</i> by The Archive Britain Campaign & <i>Early Aviation: the Pioneering Years through to the First World War</i> by The Archive Britain Campaign	Reviewed by Scott A Willey 66
<i>December 8, 1941: MacArthur's Pearl Harbor</i> by William H Bartsch	Reviewed by Jim Gates 66
<i>Fallen Astronauts: Heroes Who Died Reaching for the Moon</i> by Clin Burgess & Kate Doolan	Reviewed by Rick W. Sturdevant 66
<i>It Happened at Bakers Creek, Australia: A History of the Fifth Air Force's Worst Air Crash</i> by Robert S. Cutler	Reviewed by William H Bartsch 67
<i>The Cambridge Aerospace Dictionary</i> by Bill Gunston, ed.	Reviewed by Scott D. Murdock 68
<i>A-10s Over Kosovo: The Victory of Airpower over a Fielded Army as Told by the Airmen Who Fought in Operation Allied Force</i> by Christopher Haave & Phil Haun	Reviewed by Darrel Whitcomb 68
<i>Valley of Decision: The Siege of Khe Sanh</i> by John Prados & Ray W. Stubbe	Reviewed by Henry Zeybel 70
<i>Airpower Advantage: Planning the Gulf War Air Campaign</i> by Diane T. Putney	Reviewed by Curtis H. O'Sullivan 71
<i>Making War, Thinking History: Munich, Vietnam, and Presidential Uses of Force from Korea to Kosovo</i> by Jeffrey Record	Reviewed by John L. Cirafici 71
<i>My B-29 Story: A Top Gunner's World War II Experiences</i> by Roger Sandstedt	Reviewed by Scott A Willey 72
<i>Afterburner: Naval Aviators and the Vietnam War</i> by John D. Sherwood	Reviewed by Kenneth P. Werrell 73
<i>A Question of Loyalty: Gen. Billy Mitchell and the Court-Martial that Grippped the Nation</i> by Douglas Waller &	Reviewed by Joseph R. Davis 73 Reviewed by Curtis H. O'Sullivan 73
<i>Echoes of Eagles: A Son's Search for his Father and the Legacy of America's First Fighter Pilots</i> by Charles Wooley with Bill Crawford	Reviewed by Scott A Willey 74
<i>American Military Aviation: The Indispensable Arm</i> by Charles J. Gross	Reviewed by Jeremy R. Kinney 75
Books Received	76
Coming Up	78
Letters, News, Notices, Reunions	80
History Mystery	84

The Air Force Historical Foundation



Air Force Historical Foundation
1535 Command Drive – Suite A122
Andrews AFB, MD 20762-7002
(301) 981-2139
(301) 981-3574 Fax
E-Mail: afhf@earthlink.net
http://afhistoricalfoundation.com

Officers

President

Lt. Gen. Michael A. Nelson, USAF (Ret)

Vice-President

Gen. John A. Shaud, USAF (Ret)

Secretary-Treasurer

Maj. Gen. John S. Patton, USAF (Ret)

Executive Director

Col. George K. Williams, USAF (Ret)

Advisors

Gen. John P. Jumper, USAF

Lt. Gen. John R. Dallager, USAF

Lt. Gen. Donald A. Lamontagne, USAF

Brig. Gen. Frederick F. Roggero, USAF

CMSAF Gerald R. Murray, USAF

Mr. C. R. "Dick" Anderegg

Board of Trustees

Col. Kenneth J. Alnwick, USAF (Ret)

Mr. F. Clifton Berry, Jr.

Maj. Gen. Ralph S. Clem, USAF (Ret)

Lt. Gen. John B. Conaway, USAF (Ret)

Lt. Gen. Russell C. Davis, USAF (Ret)

Gen. Michael J. Dugan, USAF (Ret)

Gen. Ronald R. Fogleman, USAF (Ret)

Maj. Gen. John P. Henebry, USAF (Ret)

Col. George A. Henry, Jr., USAF (Ret)

Lt. Gen. Bradley C. Hosmer, USAF (Ret)

Brig. Gen. Alfred F. Hurley, USAF (Ret)

Brig. Gen. James A. Jaeger, USAF (Ret)

Mr. John Kreis, USAF (Ret)

Gen. Walter Kross, USAF (Ret)

Maj. Gen. Charles D. Link, USAF (Ret)

Hon. Hans Mark

CMSgt Norman A. Marous, USAF

Gen. Thomas S. Moorman, Jr., USAF (Ret)

CMSgtAF Sam E. Parish, USAF (Ret)

Col. Robert E. Vickers, Jr., USAF (Ret)

Col. George Weinbrenner, USAF (Ret)

Trustees Emeriti

Lt. Col. Maynard Y. Binge, USAF (Ret)

Lt. Gen. Devol Brett, USAF (Ret)

Lt. Gen. William E. Brown, USAF (Ret)

Lt. Gen. Charles G. Cleveland, USAF (Ret)

Gen. Bennie L. Davis, USAF (Ret)

Gen. Howell M. Estes, Jr., USAF (Ret)

Mr. John E. Greenwood

Gen. Robert T. Herres, USAF (Ret)

Dr. I. B. Holley, Jr.

Maj. Gen. Jeanne M. Holm, USAF (Ret)

Gen. David C. Jones, USAF (Ret)

Lt. Col. Donald S. Lopez, USAF (Ret)

Col. Kenneth Moll, USAF (Ret)

Col. Helen E. O'Day, USAF (Ret)

Hon. Verne Orr

Maj. Gen. John S. Patton, USAF (Ret)

Maj. Gen. Ramsay D. Potts, USAF (Ret)

Gen. Bernard A. Schriever, USAF (Ret)

Gen. W. Y. Smith, USAF (Ret)

MSgt. Charles J. Warth, USAF (Ret)

Col. Sherman W. Wilkins, USAF (Ret)

Maj. Gen. Richard A. Yudkin, USAF (Ret)

Contributing Members

The individuals and companies listed are contributing members of the Air Force Historical Foundation. The Foundation Trustees and members are grateful for their support and contributions to preserving, perpetuating, and publishing the history and traditions of American aviation.

Benefactor

Mrs. Ruth A. (Ira C.) Eaker Estate

Patron

Maj. Gen. Ramsay Potts

Quesada Foundation

Sponsors

Maj. Gen. William Lyon

Maj. Gen. John S. Patton

Gen. William Y. Smith

Donors

Mr. John F. Donahue

Emerson Electric

Rockwell International

Gen. Bernard A. Schriever

Supporters

The Aerospace Corporation

Allied-Signal Aerospace Corporation

Arthur Metcalf Foundation

Lt. Gen. John B. Conaway, USAF (Ret)

CSX Corporation

Gen. Howell M. Estes, Jr., USAF (Ret)

Brig. Gen. Brian S. Gunderson

Maj. Gen. John P. Henebry

Gen. & Mrs. Robert T. Herres

Maj. Gen. Harold E. Humfeld

McDonnell Douglas Foundation

Mrs. Irene W. McPherson

Maj. Gen. Kenneth P. Miles

Northrop-Grumman Corporation

Mr. William O'Rourke

Mr. James Parton

Mr. George Pendelton

Pratt & Whitney

United Technologies

Capt. William C. Ward

Maj. Gen. Richard A. Yudkin

Annual Contributing Members

ANSER

ARX, Inc.

ASTECH/MCI Manufacturing, Inc.

Beech Aircraft Corporation

Boeing Defense & Space Group

General Electric Company

Instrument Systems Corp.

Litton Industries

Lockheed Martin Corp.

The Mitre Corporation

Northrop Corporation

Vinell Corporation

AIR POWER *History*

The Journal of the
Air Force Historical Foundation
Spring 2005 Volume 52 Number 1

Publisher

Editor

Jacob Neufeld

Technical Editor

Robert F. Dorr

Book Review Editor

Scott A. Willey

Layout and Typesetting

Richard I. Wolf

Advertising

Mark D. Mandeles

Circulation

Richard I. Wolf

Air Power History (ISSN 1044-016X)

is produced in March, June, September,
and December by the Air Force Historical
Foundation.

Prospective contributors should consult the
GUIDELINES FOR CONTRIBUTORS at
the back of this journal. Unsolicited manu-
scripts will be returned only on specific
request. The Editor cannot accept responsi-
bility for any damage to or loss of the man-
uscript. The Editor reserves the right to
edit manuscripts and letters.

Address Letters to the Editor to:

Air Power History
P.O. Box 10328
Rockville, MD 20849-0328
e-mail: jneufeld@comcast.net

Correspondence regarding missed issues
or changes of address should be addressed
to the **Circulation Office**:

Air Power History
P.O. Box 151150
Alexandria, Virginia 22315
Telephone: (301) 981-2139
Fax: (703) 923-0848
e-mail: airpowerhistory@yahoo.com

Advertising

Mark Mandeles
8910 Autumn Leaf Ct.
Fairfax, VA 22301
(703) 426-5147; fax 426-5149
e-mail: mandelm@erols.com

Copyright © 2005 by the Air Force
Historical Foundation. All rights reserved.
Periodicals postage paid at Lexington, VA
24450 and additional mailing offices.

Postmaster: Please send change of
address to the Circulation Office.

In this issue, we embark on a fabulous journey through air power history. Our guide is Keith Ferris—the “Dean of Air Force Art.” Mr. Ferris illustrates the journey via an essay with superb photographs and paintings that begins with his birth seventy-five years ago to an Army Air Corps family and wends its way through today. His love of family and obsession with planes are clearly evident.

In “Ozark Lead is out of the Aircraft,” Howard Plunkett narrates the harrowing ordeal of Major Bob Barnett, an F-105D “Thud” pilot, who was shot down and subsequently captured in October 1967, during the Vietnam War. Readers will follow the failed rescue attempt, Barnett's subsequent imprisonment, and then his release and return to flying status.

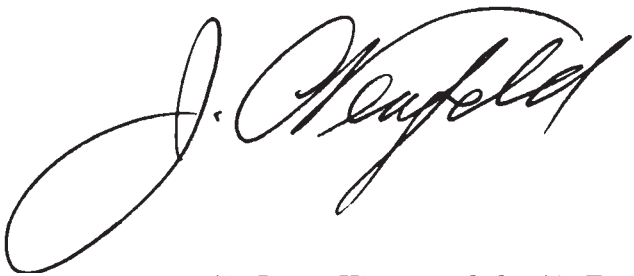
Next, Paul Johnston traces the evolution of tactical air power doctrine in both the Royal Air Force and the U.S. Army Air Forces in North Africa during World War II. Johnston's method is to compare the complexities of thinking in both the British and American air forces in order to discern whether and how one side might have influenced the other. Many readers will come away surprised by the possibilities offered.

Finally, Don Chipman, a professor recently retired from the Air University, analyzes the significant role of the air plan in winning Gulf War I. Dr. Chipman take us behind the scenes to unfold the powerful dynamics of strategic thinking and the influences of personality that framed the debate and generated the victorious plan.

More than a dozen book reviews appear in this issue. Covering a variety of subjects and authors, the reviews are meant to inform and guide readers about the latest research and writing in air power history.

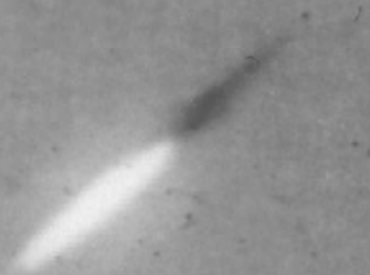
To pique your interest and provoke discussion—we have published several interesting letters. Readers are encouraged to participate in an opinion poll generated by some of these letters. (See page 81.) In addition to the “Letters to the Editor,” announcements, news items, upcoming events, reunions, and the History Mystery round out the departments.

Finally, we thank and gratefully acknowledge the contributions made by our referees, who provide outstanding peer review and sage advice regarding the publishability of manuscripts submitted for consideration. The referees' critiques and suggestions for improvement help to refine all of the works published.

A large, stylized handwritten signature in black ink, reading "J. Neufeld". The signature is fluid and cursive, with a large loop at the beginning and a long, sweeping tail.

Air Power History and the Air Force Historical Foundation disclaim responsibility for statements, either of fact or of opinion, made by contributors. The submission of an article, book review, or other communication with the intention that it be published in this journal shall be construed as prima facie evidence that the contributor willingly transfers the copyright to *Air Power History* and the Air Force Historical Foundation, which will, however, freely grant authors the right to reprint their own works, if published in the authors' own works. In the case of articles, upon acceptance, the author will be sent an agreement and an assignment of copyright.

"Ozark Lead is out



of the Aircraft"



W. Howard Plunkett

(Overleaf) An SA-2 heading toward an F-105D. The photo was taken in January 1968 by a KA-71 strike camera in an F-105F. The pilot in the F-105D was 1Lt Earl J. Henderson who evaded the missile. (USAF photo from Earl Henderson.)

COL. ROBERT W. "BOB" BARNETT ... LAST FLEW AN AIR FORCE JET SEVEN YEARS AND NINE MONTHS EARLIER WHEN HE WAS SHOT DOWN IN HIS F-105D

The takeoff on July 16, 1975, of two T-38 Talons from Randolph Air Force Base (AFB), Texas, was like most other flights by student pilots flying the sleek supersonic trainers. Once airborne, the planes looped and rolled and flew Immelmans and Cuban 8s, standard aerobic maneuvers student pilots must master.¹ They landed back at the base after the one-hour flight. "Freedom 138" was the call sign of one of the planes and, for its student pilot, the flight was anything but routine. It was the "Champagne Flight" of former POW Col. Robert W. "Bob" Barnett who last flew an Air Force jet seven years and nine months earlier when he was shot down in his F-105D over North Vietnam.² This flight, with instructor pilot Lt. Col. Rocco DeFelice of the 560th Flying Training Squadron, was the beginning of Bob's return to flying status after five and a half years of torture and isolation in North Vietnamese prisons and two years of recuperation following his "Freedom Flight" on the C-141 that flew him and his fellow POWs out of North Vietnam on March 14, 1973.³ Of his T-38 flight after years out of the cockpit, Bob Barnett remarked, "I felt that I hadn't missed a beat. We made a formation take off and I was right there."⁴

This article tells the story of how he got there. It describes his being shot down in his F-105 and his three days on the ground before being captured and taken to Hanoi. It is one of many combat stories about F-105 pilots and their valiant efforts during the failed bombing campaign called "Rolling Thunder." Bob's ordeal began with his mission on October 3, 1967.

Tuesday, Oct 3, 1967: SAMs and MiGs

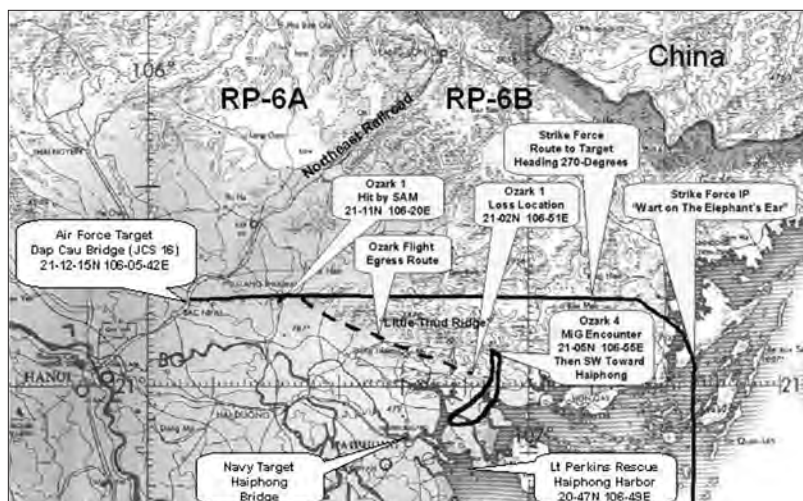
Continuing their almost daily attacks against targets along the Northeast Rail Line in North Vietnam, the 388th Tactical Fighter Wing (TFW) from Korat Royal Thai Air Force Base, launched an afternoon strike of F-105 Thunderchiefs against the Dap Cau railroad and highway bridge 20 nautical miles northeast of Hanoi. The bridge was number 16 on the Top Secret target list compiled by the Joint Chiefs of Staff. Part of the strike force was targeted against the Dap Cau bypass bridge, a pontoon bridge about one mile south of the main bridge.⁵ Both bridges had been bombed many times before but were to be hit again in a persistent effort to block trains and trucks carrying goods from China to Hanoi.⁶

It was the height of the Rolling Thunder bombing campaign that had started in March 1965, and other strike forces were taking advantage of this afternoon's unusually clear weather. Takhli's 355th TFW was sending four flights of F-105s against the Lang Gia railroad yard further north on the Northeast Rail Line, and Navy A-4 Skyhawks from the carrier *Intrepid* were attacking the railroad and highway bridge just north of Haiphong.⁷ The Northeast Rail Line separated the section of North Vietnam assigned to the Air Force, Route Pack 6A, from the Navy's Route Pack 6B. Korat's route to their target crossed Navy territory. The F-105s were to be covered by a MiG-CAP flight of F-4C Phantoms, and supported by the electronic equipment operators in an EB-66B orbiting off the coast to jam the North Vietnamese radars that guided their surface-to-air missiles (SAMs) and aimed their anti-aircraft artillery (AAA) flak guns.⁸

Korat's F-105 strike force consisted of a Wild Weasel flight with radio call sign "Warhawk," followed by four strike flights with call signs "Pistol," "Hatchet," "Ozark," and "Crossbow" that were to attack the target in one-minute intervals.⁹ The two-seat F-105F Wild Weasels, with their specialized electronics and radar-seeking missiles, were to find and kill SAM sites and to call out SAMs heading their way so that strike pilots could spot and avoid them. Each strike flight had four single-seat F-105Ds that carried 750-pound bombs or cluster-bomb units (CBUs) for attacking the bridge or nearby flak sites.

The F-105s from Korat flew from their base in Thailand, then across Laos to the Gulf of Tonkin where they refueled from KC-135 tankers in the "Tan" refueling track, an established tanker orbit area off the southern coast of North Vietnam. They then flew north until they reached their turn point, an island landmark off the northern coast of North Vietnam that the pilots called "The Wart on the Elephant's Ear." From this point they headed west, passing above Haiphong, toward Dap Cau.¹⁰ It was dangerous territory where planes on the morning missions in the same region had met up with ten SAMs. This afternoon's pilots expected the same reception. They were carrying QRC-160-1 electronic countermeasure (ECM) jamming pods and flying at an altitude of 16,000 feet in pod formation—1,500 feet horizontal and 500 feet vertical separation of the four planes in each flight—that masked their individual aircraft from North Vietnam's radar.¹¹

W. Howard Plunkett is a retired Air Force lieutenant colonel. His twenty-year career as an aircraft maintenance officer began with F-105s in 1964. He was a distinguished graduate from Squadron Officers School and earned an MS in logistics management from the Air Force Institute of Technology (AFIT). Since his retirement in 1983, he has worked in the aerospace industry as a reliability engineer, in software support and quality assurance, as a logistics manager and technical writer, and in business development. His previous publications about the F-105 include an article in the Air Force Museum's Friends Journal (Winter 1994/1995) and a book, F-105 Thunderchiefs, published in 2001 by McFarland & Company, detailing the histories of all surviving F-105s in museums and on static display around the world. This article is from his research for a future book on F-105 operations during Operation Rolling Thunder.



This illustration shows the area in North Vietnam of "Ozark" flight's ordeal on October 3, 1967. (Illustration created by author.)

THE STRIKE FLIGHTS ALSO ADJUSTED THEIR POSITIONS ... TO DIVE BOMB THEIR TARGET

SUDDENLY, THE WILD WEASEL FLIGHT DETECTED SAMs LAUNCHED AT THEM

Maj. Robert W. Barnett, from the 469th Tactical Fighter Squadron (TFS), flying F-105D 59-1727, led "Ozark" flight, the third of the four strike flights from Korat. He had arrived at Korat in July 1967, and, nine days before his thirty-ninth birthday, was flying his 43d mission over North Vietnam. Others in his flight were "Ozark 2," Capt. Russell E. Temperley, thirty-two years old, assigned to Korat since late May, who was flying F-105D 60-0435; "Ozark 3," Capt. Roger P. Scheer in F-105D 60-0434; and "Ozark 4," twenty-six-year-old 1st Lt. Earl J. Henderson flying F-105D 60-0461, who had only 150 hours flying F-105s and was on his seventeenth combat mission. He carried an audio tape recorder wired into his interphone and UHF (Ultra-High Frequency) radio that recorded his comments and radio calls during most of the mission.¹²

Before the flight took off, Captain Scheer's plane developed problems and he aborted. His place as "Ozark 3" was taken by the flight's spare, Maj. Wintford L. Bazzell, a forty-three-year-old staff officer from the 388th TFW headquarters with fifty-two missions over North Vietnam. He flew F-105D 62-4359. Years later, Wintford Bazzell recalled, "There were many aborts on this mission. My aircraft was still being worked on when the mission took off." He caught up with his flight after he refueled from the tanker that was making its last orbit in its refueling track over the Gulf of Tonkin.¹³

Bob Barnett had not previously flown with any of the pilots in his flight. "I had just been moved over to the 469th from the 44th TFS so I didn't really know any of these guys."¹⁴

Maj. Morris L. McDaniel from the 13th TFS, with his Electronic Warfare Officer (EWO) Capt. William A. Lillund, led "Warhawk," the Wild Weasel flight. This crew had been at Korat since July 18, 1967, and normally flew single-ship "Ryan's Raider" missions at night in their F-105F.¹⁵ Maj. McDaniel had been one of his student pilots when Maj. Barnett was an F-86D flight instructor at Perrin AFB, Texas, in the late 1950s.¹⁶

As the strike force reached its turn point, the Wild Weasel flight, already over the target, began alerting the strike force to SAMs in the area, call-

ing specific SAM sites by their lead designation and using the day's SAM code word, "Football." "Warhawk, Warhawk Lead, Lead 30 506. Football, out."

The mission commander in "Pistol," the first of the strike flights, announced his progress to the target. "Pistol Force is at the Wart. Pistol Force, I say again, the Wart is at 12 o'clock."¹⁷

"Warhawk" alerted the strike force that the weather over the target was clear. The radar from a second SAM site came up. "Warhawk, Warhawk Lead. Lead 48 508. Football, out."

The strike flights also adjusted their positions using their afterburners (AB) to hold pod formation on their run-in to the bridge and to get into position to dive bomb their target.

Suddenly, the Wild Weasel flight detected SAMs launched at them. "Take it down! Take it down, take it down, Warhawk!"

While the Weasels were dodging the SAMs, an airborne controller alerted the force to MiGs in the area. "Bandits, Bandits. NE 80. Time 14. Ethan Alpha, out."

By 3:10 p.m., Barnett's "Ozark" flight was a mile from their target. The four F-105Ds, each carrying six 750-pound bombs on a rack under their fuselage, along with two 450-gallon fuel tanks and two ECM jamming pods on the wing stations, were lining up to attack the pontoon bypass bridge.¹⁸

Bob Barnett recalled, "I was back leading the flight in the right hand box, and the Weasels were out ahead. Close to the target, I could hear the SAMs being deployed. When they're fired, the SAM operators turn the power up and the red light in the F-105's cockpit comes on. I heard the call, 'SAM, SAM' so I started looking down to see where it was and then looked back to the target. I was just ready to roll in."¹⁹

The radio calls told of more SAM launches. "Crossbow, SAM should go clear. Hold it."

Three SAMs were headed straight into the strike force. "Detonation to the right, Crossbow. It looks like you got somebody hit." Lt. Henderson called out, "Rog. That's Ozark Lead and let's follow him in."²⁰

Henderson had seen a SAM explode behind Barnett's plane. Unknown to the Americans, North Vietnamese SAM operators, probably helped by their Soviet advisors, had recently developed a three-point track-on-jam technique that overcame the effects of the F-105's pod formation in masking individual aircraft.²¹ Earl Henderson described what he saw. "The second SAM passed very close under Bob's aircraft and detonated. With the high closure rate (Mach 1 for us and Mach 2 for the SA-2), the detonation, smoke cloud, and debris were gone in the blink of the eye. Bob immediately started trailing a wisp of smoke. He jettisoned his stores and began a right turn back east. The other three Ozarks jettisoned ordnance and external fuel tanks and went with him."²²

Russ Temperley, "Ozark 2," heard the SAM warning signals in his cockpit but did not see the missiles heading toward them. "I recall seeing my launch light on my detector and hearing the

I WAS JUST ABOUT READY TO HIT THE BURNER AND THIS THING BLOWS UP

OZARK LEAD IS OUT OF THE AIRCRAFT. GOOD CHUTE

buzzing loudly, indicating my aircraft was targeted; but, by then the launch lights had become numerous and we were approaching the target area so my attention needed to be focused on the upcoming drop. Ozark Lead stated he, too, had a launch light indicating his aircraft was targeted also. Concerned about the up-coming SAM, I glanced for it below and beside Ozark Lead but could not see it. Ozark Lead and our flight maintained a steady, unswerving course into the target area.”²³

Bob Barnett recalled, *The Weasel flight had turned outbound about the time the SAM was launched and I guess he was looking up and he must have been looking at the first flight because he said, “No threat it’s going behind the force.” I was just about ready to hit the burner and this thing blows up. The airplane porpoises and I get red lights right away so I started to turn. Russ Temperley, number 2 man, said, “Jettison your ordnance.” So I punched off my bombs and I started to turn and lit the burner because Hanoi was right there. I had a fire light and then, as I finished a 180-degree turn, I felt the controls were getting stiff. I had the slab lock mod so I reached down and locked the slab, set my speed at 360 knots, and I could control it with the flaps.*²⁴ After I rolled out, I tried to talk to everybody. There was so much chatter, so I said, “Let’s go to manual.” I tried to find out what they could see on my airplane, what kind of problems I had. All three of them had caught up with me.”²⁵

Henderson recalled, “I ended up on his right side high as we headed east. His aircraft continued to burn off and on with a very small, blue-gray flame (hydraulic fire) coming out of the tail section.”²⁶

In what would be his last radio call from his burning F-105, Major Barnett reported his condition to his flight. “OK I am in Stab Lock. I’ve lost both my hydraulic systems. I’ve got a fire light and everything. I’m trying to get out to the water.” He recalled, “I was heading back towards the ocean and about that time I lost my radio so I couldn’t talk to anybody any more.”²⁷

Henderson flew alongside of Barnett. “Just a few miles before the water, his aircraft began to gently porpoise and lose speed and altitude. I began an ‘S’ turn to stay with him but he slipped behind me and I had to aggressively move out to his right to stay with him. His drag chute door popped open and slowly his drag chute came out and tore off.”²⁸ The cockpit tape captured his comments to himself. “We’re in burner. We’re following him out. OK, his fire’s out but he’s going to have to get out of it. No, his fire’s not out.” Henderson tried to warn his flight lead of his condition but didn’t receive a reply. “OK, Ozark lead, this is Four. You got just a small fire right in the very tail end.”²⁹

Major Barnett could continue flying his crippled plane for only a short while more. “I kept heading towards the coast and pretty soon the oil pressure light came on. It was still burning. About that time the engine goes ‘crunch’ and I’m about 10 miles from the coast. I shut it down as soon as I heard it start freezing. It started rolling and I started to step on the rudder to keep it straight and I thought,

‘Well ... let’s get out of here.’ So I ejected about 360 knots about 16,000 feet.”³⁰ As Barnett’s parachute opened, it tangled in the inflatable life raft from his survival kit that was packed in his ejection seat.

As I went out, the raft somehow activated. The raft goes up on a lanyard and then the parachute opens and wraps around the lanyard and I look up and the parachute is in a big ball. When I first stabilized, I was looking down. I had the idea I was going to break my legs during the ejection. We had a lot of people break their legs. So the first thing I did was to reach down to feel my legs and they weren’t broken. But I was looking down and I saw the airplane in a fireball right between my feet. That’s when I looked up and saw my parachute in a ball. I still had my helmet on and I got my knife out. I was going to see if I could cut some risers or something to get this thing untangled. I couldn’t see where there was anything I could do, so I put the knife back in. I just sort of watched it. I was spinning around as I was going down. After a little while the parachute started opening up and the risers would go up to the boat then to the parachute. I was going around. It was a beautiful day. I actually was in kind of a slow swing. I’d swing around, I could see Hanoi, then I’d go back around and see the ocean. It was so quiet after that. Then I was getting close to the ground. I tried to get my helmet visor down. I was having trouble with that and I was getting closer to the trees so finally I just put my feet together and went flying through the trees. Felt myself ricocheting off branches and finally my legs hit one branch and the parachute hung up in the trees. And then I fell about 10 feet horizontally right in a bunch of bushes. [It] [k]nocked the wind right out of me. I laid there a little bit until I got my breath back. Then I started feeling around and said, ‘Jeez, I got all my pieces.’ So I felt pretty good then.”³¹

The strike force began forming a rescap (rescue combat air patrol) to identify Major Barnett’s location and to direct a helicopter rescue but they had trouble joining up with each other and locating Barnett on the ground. The radio calls reflected their confusion. A pilot from another flight: “Did somebody go down? Or did somebody get hit?”

“No. Ozark Lead is out of the aircraft. Good chute. On the ground. In the mountains.”

“Is somebody capping him?”

“That’s affirmative.”

Lieutenant Henderson believed he should head for a tanker to refuel and then return for the rescap. However, Pistol Lead told “Ozark” flight to stay over Barnett and “Pistol” flight would refuel and return to take over the rescap. Eventually, Captain Temperley flew high cover while Major Bazzell “stayed low where I could watch the area where Barnett landed.”³²

As the strike force commander was returning from refueling, he asked for Barnett’s location on the ground and Henderson gave the location based on an azimuth and distance from TACAN Channel 20 broadcast by a Navy ship in the Gulf of Tonkin

1Lt Earl J. Henderson,
"Ozark 4," 469 TFS, posing
in front of F-105D 62-4269.
(USAF photo from Earl
Henderson.)



DURING THE TIME IT WAS ON, THE BEEPER BLOCKED RADIO CALLS THAT FUR- THER DELAYED SETTING UP THE RESCAP

about thirty nautical miles off the coast of North Vietnam. The rescap pilots, Captain Temperley, "Ozark 2," Major Bazzell, "Ozark 3," and Lt. Henderson, "Ozark 4," continued trying to locate each other and Barnett but were getting low on fuel and were receiving enemy AAA fire.

While the rescap pilots were trying to sort out their positions and locate their downed flight lead, Barnett on the ground was unfastening his parachute and moving to what he hoped was a better area for rescue.

I pulled the parachute out of the tree and rolled it up into a ball. I hid it under the tree and disconnected it and I started running away from where I was 'cause I didn't want to be in the same area. I was about 10 miles from the coast. I was just north northeast of Haiphong, what we called 'Little Thud'. It was very treed and jungle-y. So I started running away and stopped and got my radio out to talk and I could hear the beeper. I thought, "Jeez, the beeper in the 'chute, I didn't turn it off." So I ran back and I couldn't find the damn parachute. So I said, "Well I'd better not stay around here." So I ran again and then I finally stopped and I got my radio out and I noticed that it was on. Somehow, the beeper on the radio was the one that was activating. I guess somewhere in my confusion I turned the one off in the parachute but this one was going. So I finally turned it off and then the beeper stopped."³³

However, during the time it was on, the beeper blocked radio calls that further delayed setting up the rescap. Henderson tried to raise Barnett on the radio. "Ozark Lead, Ozark Lead, this is Ozark 4 on Guard. How do you read?"

His radio call was overheard by a Navy

destroyer in the Gulf of Tonkin, with call sign "Steel Hawser," which coordinated search and rescue (SAR) operations in RP-6B, the Navy's assigned area of North Vietnam.³⁴

Barnett's beeper was blocking radio calls on Guard channel with its loud, persistent Whoop! Whoop! The flight finally changed radio channels to avoid the interference from Barnett's beeper.

After turning off his beeper, Barnett tried to get into a better position for a helicopter to pick him up. "I moved about a mile or so away from where I'd hit. I ran up the hill and got on the radio. I talked to 'Olds' flight, which was an F-4 flight. I was all ready to get picked up. I had a good spot there. I had open space."³⁵

At this point, Henderson spotted two MiG-21s and his attention was distracted by this new threat. The MiGs were "in a fighting wing formation at about 12,000 feet (12,000 feet below me), moving very fast on a reciprocal heading. By the time I comprehended that they were MiGs, the opportunity to 'swoop' down on them was gone."³⁶

Steel Hawser was still trying to understand where Barnett was on the ground and called for Henderson to flash his IFF (Identification Friend or Foe) so they could spot him on their radar. "Squawk flash, Ozark."

"Ozark, flash."

"OK. Holding your flash at this time, Ozark 4. Is he feet dry?"

"Affirmative. I've got a couple of MiGs on me right now, though. Ah! I need some help up here. OK. Ozark 2, this is Ozark 4. There's two MiG-21s in the area." Temperley had lost sight of Henderson but tried to rejoin to help with the MiGs.³⁷

An orbiting Navy UH-2A rescue helicopter, a type known as "Big Mother," had been listening to

Pilots of the 469 TFS at Korat RTAFB gathered in mid-October 1967 in front of their squadron building. The three pilots in "Ozark" flight from the October 3 mission are Capt Russell E. Temperley, "Ozark 2," standing second from left; 1Lt Earl J. Henderson, "Ozark 4," standing third from left; and Maj Wintford L. Bazzell, "Ozark 3," standing second from right. (USAF photo from Earl Henderson.)



DUE TO THEIR LOW FUEL, THE REST OF OZARK FLIGHT ... DID NOT JOIN HENDERSON IN CHASING THE MiG-21s

the radio calls and volunteered to go in. "Steel Hawser, this is Big Mother. May I have permission to proceed to that area and stay feet wet?" But they were held by Steel Hawser in their position over the Gulf of Tonkin. "OK. Steel Hawser. Maintain present position."³⁸

Henderson was still coping with the MiG-21s. "As I continued my orbit and talking to Steel Hawser, I spotted the MiGs again coming at me from near head on. One of them was shooting his cannon. As they flashed by, I reversed my direction and tried to turn in behind them."³⁹

"Oh, shit. There they go. OK. Steel Hawser. This is Ozark 4. Can you get me some F-4s up here?"

"Roger. We're doing it now Ozark 4, hang on."⁴⁰

*My turn was now to the right, but I did not initially see them. As I looked behind me, I spotted both MiGs at fairly close range (3,000 feet, closing for perhaps a gun shot). I continued a very high-G right hand descending spiral, "dishing out" at about 8,000 feet. The two MiGs broke off the attack without firing weapons (that I know of) and headed for Haiphong in a climb. Either they were out of gas (likely) or thought they had succeeded in shooting me down.*⁴¹

Abandoning his rescap for Major Barnett, and despite being critically low on fuel, Henderson started after the MiGs.

*I rolled in behind them about 2 miles in trail and began to chase them. My speed got up to about 1.2 Mach, but it took a very long time to close any distance. As I looked down and saw 4,000 lbs of fuel, I realized that I would never reach them and have enough gas to get home. Plus we were getting near the eastern edge of Haiphong. I decided to at least throw some 20-mm in their direction. I fired about 600 rounds of 20-mm from about 5,000 feet away, without success and turned back to the east to go to the tanker.*⁴²

His tape recorder captured his MiG pursuit and Capt Temperley's attempt to help. Henderson to himself: "I'm running out of gas before long here." Henderson: "OK. I'm getting in trail with these 21s."

Temperley: "Ah, Rog. I see 'em myself."

Henderson on intercom: "OK, baby! Waa! Hooo! Aah! Son of a bitch. Ah. Come on! Go! Go! Ugh!"⁴³

Due to their low fuel, the rest of Ozark flight began looking for a tanker and did not join Henderson in chasing the MiG-21s. Bazzell, "Ozark 3," recalled, "After about 10 minutes, we could see trucks heading towards the area where Barnett had landed. As we circled the area, numerous SAMs and anti-aircraft fire were directed at us."⁴⁴

While Barnett was waiting to be rescued and the rest of "Ozark" flight was coping with SAMs, AAA, and MiG-21s, North Vietnamese AAA had blasted a Navy A-4B (with call sign "Nevada City 102") that had been attacking the bridge north of Haiphong. Like Major Barnett, the A-4B pilot, Lt. JG Allan D. Perkins, of VSF-3 from the carrier *Intrepid*, headed for the water. Before he cleared the coastline, his plane was hit twice more and Perkins was wounded in the left leg. When his cockpit filled with smoke, he jettisoned his canopy and then ejected at 8,000 feet. He splashed into shallow water in Haiphong harbor.⁴⁵

With a wounded Navy pilot down in the water 60 yards from an anchored cargo ship, Steel Hawser had held up the UH-2A rescue helicopter that had been heading for Barnett and sent it to Haiphong harbor instead.

The helicopter, with call sign "Clementine 1," was from Navy helicopter squadron HC-7, the Sea Devils, on the frigate *USS Coontz* (DLG-9). The helicopter, piloted by Lt. Tim McLecosky and Lt. James Brennan, skimmed the water between the ships anchored in the harbor. The crew spotted

Lieutenant Perkins' flare and pulled into a hover over the pilot. A swimmer from the helicopter jumped into the shallow water. After getting unstuck from the mud, the swimmer connected himself and Lt Perkins to the hoist cable and both were pulled aboard. The helicopter flew out of the harbor with no further trouble.⁴⁶

The three F-105 pilots in "Ozark" flight had to make several more, increasingly frantic, radio calls to "Steel Hawser" and "Red Crown," a radar-equipped Navy cruiser also off the coast of North Vietnam that vectored tankers to their receivers. With five-minutes of fuel remaining, they finally connected with a KC-135 tanker. They refueled and returned to Korat. After he landed, Captain Temperly discovered his plane had numerous holes in its left wing and fuselage caused by SAM bursts or AAA.⁴⁷

After picking up Lieutenant Perkins from Haiphong harbor and flying him to his ship for medical care, the rescue helicopter "Clementine" didn't have enough fuel and daylight to come back for Major Barnett, who was advised to hole up for the night and await rescue the next morning. While it was getting dark, he moved to the top of a hill and found a hiding place. "Just as I was settling in there, I heard a car way off in the distance and some Vietnamese get out and start yelling; but they were pretty far away. That's the first time anybody apparently got in the area where I was. They obviously knew I was there." Barnett sat awake all night. "One time during the night I saw a little animal. I don't know what it was—shiny eyes—I got my knife out and then he walked away. I was just waiting to get daylight so I could do something."⁴⁸

Wednesday Oct 4, 1967: Failed Rescue

After a sleepless night on the ground, Barnett began moving to another location where it would be easier for a helicopter pick-up. Before daylight, he started to move up the hill under a canopy of trees, weaving his way through tangled vines. He stopped near the top of a ridge in tall grass near an open area. He decided, "This is a pretty good place to stop and if they ever came in I could get picked up here."⁴⁹

Just as it was getting light, about 6:30 a.m., he heard voices in the distance. People from the local village were starting to look for him. At the same time, Navy planes appeared overhead also searching for him. An A-4 pilot with call sign "Dakota" called him on the radio but couldn't see him through the jungle.⁵⁰ Barnett replied to the A-4 pilot, "I think I'm going to get captured and I'll see you after the war." He turned off and hid his radio and laid low in the grass as the search party from the village came closer. One searcher passed within three feet of him but walked on by without seeing him. After waiting a while, he decided to work his way over to the edge of the hill to make it easier for a helicopter to get to him.

So I kind of skinnied over there and, as I got there, there were two guys sitting within three or

four feet of me. I was in the grass, in the high reeds, so I stopped and stayed there, kinda hunched back. I waited for a while and they finally left. So I sat there for quite a while trying to figure out what to do. First I realized I had to get out of this area to get picked up. So my plan was to move at least ten miles and I figured that would take me a good day or so, maybe two days, and then I'd try again. I thought probably the search was off because I just told them I was going to get captured."⁵¹

The search had been pulled back but not called off. Now that they knew where he was, the rescap planes, four Navy A-1s with call signs "Electron", were headed his way. However, one A-1 was hit in the canopy by 37-mm AAA and the planes retreated.⁵²

Barnett was still trying to avoid the enemy while positioning himself for a rescue. "It was all quiet and I hadn't heard anybody for a couple of hours. I stayed in the reeds. Finally I decided I'd better start moving. I had my compass and I started moving northeast towards the coast." Encountering only light underbrush, he made good time running along the top of a ridge. Sometime after noon he heard propeller airplanes and called them on his radio. The planes were two A-1s escorting the Navy UH-2A "Clementine" being flown by the same crew who had been diverted from picking up Maj Barnett yesterday.

I moved down the side of the hill. They said there was a helicopter 35 minutes out. I started weighing whether we should try this or not because I knew there were still people around the area but I hadn't heard anybody for a couple, three hours. It was just completely quiet. They said, 'Fire a flare.' I said, 'God, once I do this, I'm gonna expose myself— aah let's go for it.' So I got out my penknife. I fired the first one; it went about two feet and pphhhh! I think another one was no good; then finally I fired one and it went right up through the trees. About that time, an A-1 came right over the top of me. It looked like the flare almost went into his prop wash. I saw it spin up over the back of him. That's how low he was. Then they said, 'Use a smoke flare.' The first one I pulled didn't fire and the second one — pulled it and the smoke didn't go up in the trees, it went off the side."⁵³

At 12:20, the rescue helicopter "Clementine," flown by Navy Lts. Tim Mclecosky and Jim Brennan, found him. But the North Vietnamese were waiting. "I called the helicopter. I said, 'OK, come closer.' I finally said, 'You're right over the top of me.' Then right about that time, all these bullets go flying through the trees. Then I heard him say, 'Mayday, Mayday, Mayday!' I'm down here on the side of a hill, and he dumps it and I thought he was going to crash. So I go running downhill after him. I didn't know what I was going to do but somehow I felt that I was going to chase him all the way to the coast. He went putting off. I had no idea what happened to him."⁵⁴

PRETTY
SOON I SAW
FIVE GUYS
WITH
SPEARS AND
LOINCLOTHS
AND ABOUT
FIVE GUYS
WITH
UNIFORMS

A MAN GOT
OUT OF THE
TRUCK, ...
AND MADE
WHAT WAS
PROBABLY A
"THANK-YOU-
FOR-CAPTUR-
ING-THIS-
YANKEE-AIR-
PIRATE"
SPEECH

The gunfire had punctured the helicopter's fuel tanks but the crew managed to get their machine to the Gulf of Tonkin before it ran out of gas. They ditched the helicopter in the water 10 miles off shore and were picked up by "Big Mother 70," a Navy SH-3 helicopter. At 1:37 p.m., the Navy pulled back their rescue forces and Barnett had to spend a second night in the jungle.⁵⁵

After the helicopter left, Barnett hid in a ravine, lying under a camouflaged mosquito net that he placed over his head. Five minutes later, ten troops in uniform passed by without noticing him. The searchers walked to the bottom of the hill and disappeared from sight. "I felt like I was invisible. So I stayed there for another couple hours."

When he could no longer hear the search party, Barnett began looking for water. He had no food but knew he needed water to survive. He began moving down the hill in search of a stream. He encountered a hut where he heard people talking and so skirted around the area. He came to a ravine and followed it down hill where he found a small pool of water formed by a stream that disappeared into the ground. "So I got my little plastic bag, threw my pills in there, mixed them all up, drank as much water as I could, then filled up my bag. I felt pretty good."

As he continued moving northeast through the jungle toward another ridge, he encountered two trails and began working his way down between them. Two or three times he had to hide from people coming down the trails. Late in the day he reached the junction of the two trails and realized there was a village nearby. He hid until dusk as more people came down the trails toward the village. "I crossed the trail and then ran up the next hill and tried to get up on the next ridge. I kept moving until it got dark and then couldn't see where I was going anymore so I stopped and stayed there for the night. Again, very little sleep. I was living on adrenaline."⁵⁶

That night, the 388th TFW lost its third Ryan's Raider aircraft near the Lang Con railroad bridge in North Vietnam. The crew of F-105F 63-8346, using call sign "Splendid," was last heard from after refueling and starting inbound to the target. Both crewmembers were missing. The pilot and EWO were Maj. Morris Larosco McDaniel, Jr. and Capt. William Allan Lillund, who, as "Warhawk 1," called out yesterday's SAM that had knocked down Major Barnett.⁵⁷

Thursday Oct 5, 1967: Dog Bite

Early the next morning, Barnett continued hiking toward the coast. At daybreak, he ran into another trail that headed in the direction where he wanted to go. He knew the risks of being on a trail but felt that he could stay ahead of people coming up from the village and decided to follow the trail since he could travel faster. "I got on the trail and I was really moving along. All of a sudden I heard a loud voice; someone fired a gun." Maj. Barnett quickly hid again until the noises were gone. "So I

crawled up the trail and went around the bend and got up and actually jogged, ran about a half an hour after this event. I don't know if the guy was close to me but the gun was really loud. I didn't know if he was shooting at me or saw me, or what. I was feeling, 'God. I can't get caught.'"⁵⁸

While Barnett was evading the North Vietnamese searchers, Seventh Air Force Headquarters in Saigon was planning another attempt at rescuing him. They called for a "maximum effort" to start after 4:30 in the afternoon. During the day, pilots in strike aircraft in the area thought they heard Barnett's beeper and voice on the radio that located him five miles west of his position from yesterday. However, by the time rescue aircraft were available, it was too late in the day to risk sending in more planes, so, once again, the rescue was called off.⁵⁹ Rescue planners didn't yet know it but they were already too late for picking up the downed pilot.

Barnett recalled his last minutes of freedom. "I was moving along pretty good and I had moved about five or six miles from where I had been. All at once I heard some noise behind me and I got under a bush. I put my mosquito net on again to cover my face and I was looking where the noise was coming from. Pretty soon I saw five guys with spears and loincloths and about five guys with uniforms. There was one guy in front with a pistol. Then I saw this dog running just ahead of the group. The dog came right into the bushes with me and began sniffing around my head. This guy with a pistol ran up to the dog and sees me and goes, 'Hands up! Hands Up!' So I separated my hands and the dog bit me on the shoulder. He just nipped me." The men pulled the dog away and the group gathered around their prisoner. "They were all happy that they caught me. They didn't hit me or anything like that."

His captors stripped Barnett to his boxer shorts and gave him a pair of blue shorts to wear but, fortunately, let him keep his boots. "A lot of guys I know marched a long way without any boots." They tied his hands together but didn't blindfold him. The man with a gun fired a shot as a signal, nearly hitting one of his own troops, provoking nervous giggles over the near accident, then began leading their captive down the trail. Along the way, the group pointed out a dead python about 20 feet long that they had killed during their search. They reached a road and stopped under some trees. The location caused Barnett some concern since it looked like a grave had been dug but they simply stood around waiting for a truck that arrived a short while later.

A man got out of the truck, ordered that Barnett be blindfolded, and made what was probably a "thank-you-for-capturing-this-Yankee-Air-Pirate" speech to the group that applauded the pep talk. They then put their prisoner in the truck and started off. During the short ride, the man in the truck began the interrogation. "What's your name?" I told him name, rank, serial number, date of birth. Then he said, 'What's your wife's name?' 'I can't tell you that.' 'You must tell me that.' 'I can't tell you

Two months before he was shot down, Maj Robert W. Barnett poses by F-105D 59-1727, the plane he flew as "Ozark 1" on October 3, 1967. (USAF photo from Bob Barnett.)



THEY WERE
ALL
HUNKERED
DOWN AND
LOOKING AT
ME LIKE
SOMEBODY
FROM MARS

that.' 'What kind of airplane?' 'I can't tell you that.' Then he said, 'Well, you don't understand yet. I'll explain to you what the system is here. The only way you're going to live here is to cooperate.' We came into a settlement area and they put me in a little room and took the blindfold off."

The North Vietnamese then brought in an officer who had been in South Vietnam and who, Barnett was told, understood the war. "He started talking to me in Vietnamese. He's going on about whatever he did in South Vietnam. I had no idea what he was talking about. So he finally gets through and the guy says, 'See, that's what the war is all about.'"

After this incomprehensible indoctrination lecture, his captors then took Major Barnett outside and sat him in front of a large crowd ("a couple of hundred of them.") "They were all hunkered down and looking at me like somebody from Mars. But nobody said anything. They just acted like the scene of an accident. They were all whispering and looking. After they had enough of that, they put me back in this room. Then some lady came up and started hollering and beating on the wall like she was mad at me about something."⁶⁰

He was tied with a rope for the night but after his guards fell asleep, Maj Barnett untied himself and considered escaping. However, he no longer had his radio and had gotten rid of his gun and so gave up the idea. He spent the night in the little room in the small village in the mountains that the Americans called "Little Thud Ridge" listening to his captors' snoring.

That evening back in Saigon, not knowing Barnett had already been captured, Seventh Air Force planned another rescue effort to begin in con-

junction with tomorrow's Navy and Air Force strikes at 9 o'clock in the morning. The rescue force was to consist of a command and control C-130, "Crown Four", to coordinate two Air Force Jolly Green rescue helicopters. They also added a Wild Weasel flight to locate Major Barnett prior to the helicopters going in.⁶¹

Friday Oct 6, 1967: Flak Trap

Major Barnett's second day in captivity began early. At four in the morning, the door opened and a man, who turned out to be an interrogator, along with four or five troops, walked in. The interrogator demanded that Barnett write what he had been doing since he had been shot down. "I said, 'No, I can't do that.' That's the first time I got put in the ropes. The troops kicked me. They had taken my flight suit off and it was really cold up there and I was shivering. The more they hit me the more I shivered. He said, 'You must write.' I said, 'Well I can't write. I'm too cold. I need my flight suit.' So they got my flight suit and I put it on. They said, 'Now you must write.' So I started writing. I wrote, 'I hid behind a tree and I did this.' A bunch of bullshit like that. I wrote two or three times, 'I'm writing this under duress.' I figured if I ever got to a court martial...I had taken a pretty good lick there, but not that bad where I couldn't have stayed a little bit longer. But how much of a beating did I want before I eventually did something? I finally figured what I was doing was pretty innocuous. He seemed satisfied with this stuff and I used every big word I could think of—screwed it up."

After daybreak, his captors blindfolded him again and put him in a truck. They drove for a few minutes, stopped, walked a short distance, and then removed his blindfold. Barnett found himself at an anti-aircraft gun site with a group of soldiers. "I said, 'Holy cow, what's this?' Now they're going to use me as a decoy—a flak trap. This was the day when the Air Force sent the whole strike force. The third day."

Before long, A-1s flew into the area continuing the search for "Ozark 1". The North Vietnamese officer handed Barnett his radio. "He said, 'Talk to 'em.' I said, 'What'll I say?' He said, 'Say you're alive.' So I go on and say, 'I'm alive, come save me. I'm alive, come save me. I'm alive, come save me. I'm alive, come save me. I'm alive, come save me.' Then I heard them say, 'Ozark, how do you read?' 'I'm alive, come save me.' 'How do you read?' And I kept saying, 'I'm alive, come save me.' Then I heard someone say, 'Ozark If you read us, sound your beeper for five seconds.' So I got this bright idea, and I gave the radio back to the man and said, 'They want to hear the beeper.' So he puts the beeper on and it goes 'beep, beep, beep, beep, beep' for about two to three minutes, then he gave the radio back to me." Barnett then thought of another way to indicate that he had been captured. He decided to broadcast a false code word that would fool the North Vietnamese but tell the rescue pilots to stay away. "So I said, 'The code word is 'Lam'—

Col Bob Barnett (on left) and instructor pilot Lt Col Rocco DeFelice celebrate Col Barnett's T-38 "Champagne Flight" at Randolph AFB, TX, July 16, 1975. (USAF Photo from 560 FTS.)



**THE STRIKE
FORCE
PILOTS
REALIZED
THEIR CON-
TACT WITH
BARNETT
WAS BOGUS**

**FOR THE
NEXT FIVE
AND A HALF
YEARS,
MAJOR
BARNETT
WAS A
PRISONER IN
NORTH
VIETNAM**

meaning to flee or escape—then I repeated, 'The code word is 'Lam.' I said it as clearly as I could a couple or three times. And the guy said, 'What you say?' I said the code word is 'Lam.' He said, 'What's that?' 'That means 'I'm OK'. That's what we're supposed to say.'"

F-105s from the strike force had been circling the area as the pilots tried to raise Barnett on the radio. "Finally, I heard 'em say, 'We're not going down.' I saw them waltzing around and they seemed to go away. The guy turned around and said, 'Why they go away?' I said, 'Because of you.' He said, 'No. No.' I said, 'Yes. They said to do it for five seconds with the beeper and you did it for about two minutes. They knew it was no good.' He said, 'No. No. It was you.' I said, 'No. It was you.' He finally said, 'It was you. You have a very sad voice.' And I said, 'Yes. I'm very sad.'"⁶²

The strike force pilots realized their contact with Barnett was bogus and they quit trying to set up a rescue. An Air Force study on search and rescue in South East Asia described the results of the attempt to rescue "Ozark 1." "At 0951 hours, on 6 October, almost three days later, Lt. Gen. William W. Momyer, Seventh Air Force Commander, after much consideration, pulled all the forces out. Miraculously only Clementine was lost, and the crew was subsequently picked up. Though every A-1 that took part in the effort received battle damage, all were recovered safely."⁶³

Barnett had succeeded in warning his rescuers away from the morning's flak trap. The North Vietnamese then brought him to another anti-aircraft gun site where they waited for the afternoon

strike force. At two o'clock, as was their routine, the F-105s again appeared overhead. The North Vietnamese turned on the beeper in Barnett's radio but this time the strike force ignored the signals and flew on to their targets. His captors kept him at this flak site until dark. They then again blindfolded him and tied him up. After putting him in another truck, they drove through the night over the rough roads to Hanoi.⁶⁴

Saturday Oct 7, 1967: A Serious Deficiency

"Somewhere in the middle of the night we stopped. They made me get out of the truck, took my flight suit off, and gave me some shorts, or some kind of pajamas. They didn't want me in a flight suit going into town. It was about four in the morning on the 7th when I arrived at the Hanoi Hilton. For the next six days I was in the Knobby Room."⁶⁵

For the next five and a half years, Major Barnett was a prisoner in North Vietnam.

After describing the rescue efforts for "Ozark 1," the Air Force search and rescue study concluded, "This valiant rescue attempt vividly brought to the forefront a serious deficiency in the lack of a night rescue capability."⁶⁶

Epilogue

Three weeks after he reached Hanoi, Bob Barnett was joined in prison by his number two in "Ozark" flight, Capt. Russell Edwin Temperley, who was shot down on October 27th while flying F-105D 61-0126.⁶⁷ Bob and Russ were the 73d and 74th of the 103 F-105 aircrews who became POWs in North Vietnam. The two, who flew together for the first time in Ozark flight on October 3, 1967, were released together from Hanoi on March 14, 1973.⁶⁸

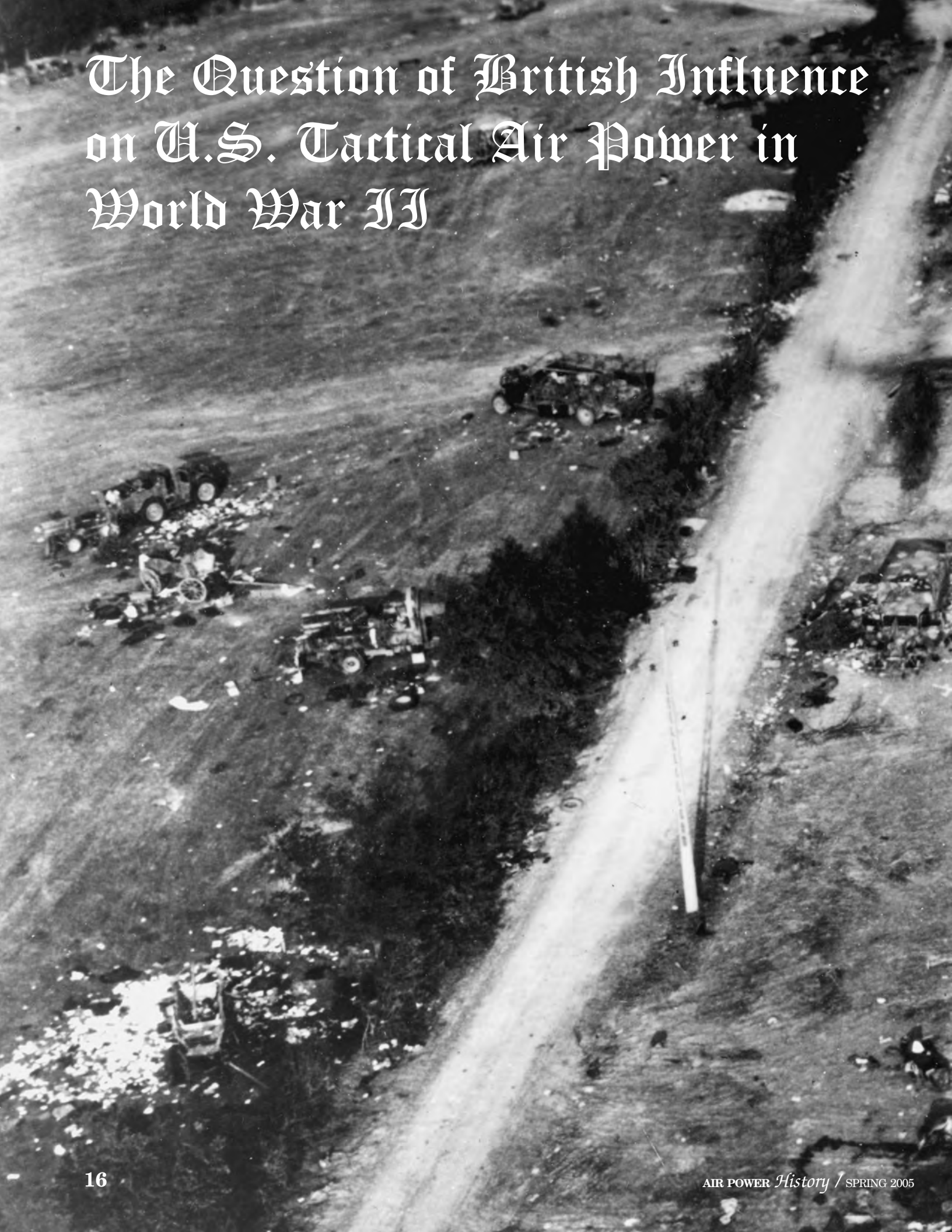
Within two months of the POWs arriving home from North Vietnam, the Air Force began a unique program of re-qualification flight training for returning many of these men to flying status and continuing their Air Force careers. There had not been a similar program for the released POWs from World War II or Korea, but as part of "Operation Homecoming" the task was given to the 560th Flying Training Squadron at Randolph AFB, Texas. Each pilot's first T-38 flight was called his "Champagne" flight with a bubbly reception on the flight line after landing to make up for his missing the traditional end-of-tour celebration upon completing 100 combat missions from his base in Southeast Asia. Between May 21, 1973, and February 24, 1976, 147 former POWs received a Champagne Flight at Randolph AFB that in most cases was the start of a training program that put them back in a cockpit and follow-on Air Force flying assignments.

Russ Temperley flew his Champagne Flight on November 6, 1973. He and Bob Barnett were two of the fifty former F-105 pilots who made these flights. This program was a testament to each man's love of flying and the Air Force's commitment to returning their Vietnam POWs to productive careers. ■

NOTES

1. Robert Barnett, e-mail to author, Apr 13, 2004.
2. *Home With Honor, Operation Homecoming*, commemorative book published by the 560th Flying Training Squadron, Randolph AFB, Texas, July 1976, p. 104.
3. His two years of recuperation included obtaining a Masters Degree in Latin American Studies from the University of Arizona. E-mail, Robert Barnett to author, Mar 22, 2004.
4. *Ibid.*
5. History of the 388 TFW, Apr-Dec 1967, USAF microfilm NO584, frame 1756.
6. F-105s had struck this target at least five times since September 1966.
7. Message, 355 TFW JOPREP JIFFY DOI 5300 OPREP-4/21 in USAF microfilm NO463, frame 1361, and Center for Naval Analysis Loss/Damage Database, Navy loss 331, microfiche sheet 01, frame E09.
8. Report, Red Baron II, USAF Fighter Weapons Center, January 1973, Volume 1, Event 31.
9. 388 TFW Mission Data Card, "Ozark 4", compiled by 1Lt Earl Henderson, Oct 3, 1967.
10. Red Baron II and Earl Henderson, e-mail to author, Mar 17, 2004.
11. Red Baron II and "Rolling Thunder Operations Handbook", 7AFP 55-2, July 15, 1968, p. 28.
12. "Ozark 4" 388 TFW Mission Data Card, and Red Baron II.
13. Letter, Winton L. Bazzell to author, Mar 25, 2004.
14. Paraphrased from the transcript of a recorded interview, author with Col Robert Barnett, USAF (Ret.), Fort Worth, TX, May 23, 2001.
15. 388 TFW history, Apr-Dec 1967, Vol II, 13 TFS History, Apr-Jul, 1967, USAF microfilm NO584, frame 0045. The Ryan's Raiders flew F-105Fs with enhanced radar displays that were intended to provide improved night and all-weather bombing. Gen. John D. Ryan initiated the program, officially known as "Commando Nail," when he became CINCPACAF. See Wayne Thompson, *To Hanoi and Back*, (Wash., D.C.: Air Force History and Museums Program, 2000), pp. 58-61.
16. Barnett interview and e-mail, Bob Barnett to author, Mar 22, 2004.
17. Transcription of "Ozark 4" cockpit audio tape, recorded by 1Lt Earl Henderson, Oct 3, 1967.
18. Red Baron II.
19. Barnett interview.
20. "Ozark 4" cockpit audio tape.
21. Merle L. Pribbenow II, "The -Ology of War: The Technology and Ideology in the Vietnamese Defense of Hanoi, 1967," *The Journal of Military History*, Vol. 67, No. 1, pp. 191 and 193.
22. Earl Henderson, e-mail to author, Feb 7, 2004.
23. Russ Temperley, letter to author, Mar 8, 2004.
24. The F-105 "Slab Lock Mod" was a switch-activated emergency system that would lock the stabilator in neutral position to prevent the plane from pitching down when both flight control hydraulic systems were lost. The system was intended to allow pilots to reach a safer area for bailout.
25. Barnett interview.
26. Earl Henderson, e-mail to author, Feb 7, 2004.
27. "Ozark 4" cockpit audio tape and Barnett interview.
28. Earl Henderson, e-mail to author, Feb 7, 2004. The F-105 carried a drag chute in a compartment in the aft fuselage below the vertical stabilizer that the pilot released after landing to slow the plane down.
29. "Ozark 4" cockpit audio tape.
30. Barnett interview.
31. *Ibid.*
32. Bazzell letter.
33. Barnett interview. The beeper was a radio signal on the Guard channel frequency that was broadcast by a pilot's handheld survival radio as well as by a transmitter in his parachute.
34. "Ozark 4" cockpit audio tape.
35. Barnett interview.
36. Earl Henderson, e-mail to author, Feb 7, 2004.
37. "Ozark 4" cockpit audio tape.
38. *Ibid.*
39. Earl Henderson, e-mail to author, Feb 7, 2004.
40. "Ozark 4" cockpit audio tape.
41. Earl Henderson, e-mail to author, Feb 7, 2004.
42. *Ibid.*
43. "Ozark 4" cockpit audio tape. To improve its success in encounters with MiGs, the USAF, in the early 1970s, instituted an air-to-air training program using T-38s to simulate MiG-21s. The T-38s, and later F-5s, were assigned to "aggressor" squadrons whose pilots flew their small jets using Soviet tactics in mock air combat against other USAF aircraft. Earl Henderson, who first encountered MiG-21s over North Vietnam as "Ozark 4", volunteered to be one of the first T-38 aggressor pilots who initiated this training program. See C. R. Anderegg, *Sierra Hotel, Flying Air Force Fighters in the Decade After Vietnam*, (Wash., D.C.: Air Force History and Museums Program, 2001), pp. 71 - 88.
44. Bazzell letter.
45. Center for Naval Analysis, Loss/Damage Database, Navy loss 331, microfiche sheet 01, frame E09.
46. "Big Mothers Stand Up", *The Hook*, Summer 1998, p. 32.
47. Temperley letter.
48. Barnett interview.
49. *Ibid.*
50. Project CHECO Report No. 55, "USAF Search and Rescue July 1966-November 1967," published Jan. 19, 1968.
51. Barnett interview.
52. CHECO Report No. 55 and *The Hook*.
53. Barnett interview.
54. *Ibid.*
55. CHECO Report No. 55 and *The Hook*.
56. Barnett interview.
57. History of the 388 TFW, Apr-Dec 1967, USAF microfilm NO584, frame 1756, and web site <http://thewall-usa.com>. Neither man's remains was found and they remained MIA until declared dead on April 27, 1978. Their names are engraved on the Vietnam War Memorial, panel 27E, line 49.
58. Barnett interview.
59. CHECO Report No. 55.
60. Barnett interview.
61. CHECO Report No. 55.
62. Barnett interview.
63. CHECO Report No. 55.
64. Barnett interview.
65. Barnett interview. The North Vietnamese used the Knobby Room to torture new POWs. See Stewart I. Rochester and Frederick Kiley, *Honor Bound*, Historical Office, Office of the Secretary of Defense, Washington D.C., 1998, p. 147.
66. CHECO Report No. 55.
67. Center for Naval Analysis, Loss/Damage Database, USAF loss 732, microfiche sheet 01, frame A24. Bob and Russ were cellmates during a few months in a prison camp near the Chinese border that the POWs called "Dogpatch." Bob Barnett, e-mail to author, Jul 4, 2004.
68. *Honor Bound*, pp. 599 and 616, and Bob Barnett, e-mail to author, Jul 4, 2004.

The Question of British Influence on U.S. Tactical Air Power in World War II





Paul Johnston

What was the British influence on U.S. theory and practice for tactical air power in World War II? Much ink has been spilt tracing the influences upon strategic bombing; less attention has focused upon tactical air power. Insofar as this was considered, the original conventional wisdom maintained several tenets. First, that during the interwar years a fixation upon strategic bombardment diverted attention away from tactical air power, and second, that in North Africa the U.S. adopted the British system for tactical air power, more or less *in toto*. Both of those theories have been modified somewhat by more recent scholarship. This newer work argues that while the U.S. Army Air Corps unquestionably emphasized strategic bombardment in the interwar years, they did not ignore tactical air power either. Likewise, the widespread view of a “British save” of U.S. tactical air power in North Africa has been challenged. One might call this the “U.S. nativist” school of thought—the theory that in the interwar period the U.S. independently developed all of the doctrinal ideas instituted in North Africa.

This paper will argue that while the nativist school of thought is quite correct in its specific assertions, overall it is insufficiently nuanced. There was a complex series of developments between 1940 and 1942, the record for which it is difficult to disentangle, but a careful examination of the record shows that while the U.S. had cultivated a doctrinal background for tactical air power in the interwar years, this was rather broad and abstract. When it came time to assemble an actual working mechanism for tactical air power, they were indeed strongly influenced by the British model at the working level.

The Original Conventional Wisdom

As one of the seminal histories of U.S. air power put it in the early 1950s, “the development of the heavy bombers and its doctrine of employment ... had a retarding effect upon attack, pursuit, and all other aviation activities.”¹ This was the view expressed by the U.S. Air Force’s own official historians and by most prominent U.S. air power historians since.² This is often explained on the grounds that it was only strategic bombing that could justify an independent air force.

Similarly, it was long believed that because of this interwar neglect of tactical air power, the inaugural performance of U.S. tactical air forces was poor, and only redeemed when they learned from the battle-hardened British. In North Africa the Americans stumbled into the big leagues when they first met the Afrika Korps, who soundly

defeated them at Kasserine Pass in February 1942. At the time and in many arguments since, this defeat was blamed in large part upon poor employment of the available tactical air power, which had been decentralized. Shortly after Kasserine, there was a reorganization of the Air Forces in the theater, which had the effect of bringing the U.S. tactical air effort under the wing of the veteran British commander of the Western Desert Air Force, Air Marshal Sir Arthur Coningham.³ The classic story is that “Mary” Coningham quickly brought order to the tactical air forces with his tried and tested methods⁴, and based upon that experience the U.S. Army Air Forces (USAAF) published new doctrine in the form of Field Manual (FM) 100-20 *Command and Employment of Air Power*.⁵ FM 100-20 has been called a “declaration of independence” by the fledgling USAAF; it set out the principles of centralized command of all air assets by a single air commander, and the absolute importance of first obtaining air superiority. All of those principles, in the original conventional view, grew from the painful experience in North Africa.

Some More Recent U.S. Scholarly Revision

The first point to be made is that rumors of tactical air power’s death in the interwar Air Corps were greatly exaggerated. Debate and thought was dedicated to the tactical role throughout not only the 1920s, but also the supposedly heavy bomber obsessed 1930s. For example, a considerable portion of the instruction syllabus at the Air Corps Tactical School was in fact devoted to tactical air power, and perhaps most tellingly of all, throughout the period the Air Corps continued to order aircraft types specifically dedicated to the tactical function.⁶ As one air power historian has pointed out, if the writings and theory of the time seem to have emphasized strategic roles over the tactical, this was only because all U.S. airmen took it as a given that tactical air power constituted a major portion of their bread and butter.⁷ In sum, a close examination of the historical record reveals that, contrary to conventional wisdom, the U.S. Army Air Corps did not in fact ignore tactical air power or allow it to languish in the interwar period.

A second major revisionist argument has been to challenge the assumption that the Americans copied their doctrine for tactical air power from the British in North Africa. In the wonderfully titled paper, “A Glider in the Propwash of the RAF?” the distinguished U.S. air power historian David R. Mets argued most forcefully that the Americans did *not* learn their basic doctrine from the British in North Africa.⁸ Mets concludes that the senior

THE DEVELOPMENT OF THE HEAVY BOMBERS AND ITS DOCTRINE OF EMPLOYMENT ... HAD A RETARDING EFFECT UPON ATTACK, PURSUIT, AND ALL OTHER AVIATION ACTIVITIES.

Paul Johnston is a major in the Canadian Air Force. He graduated with an Honors BA in Military and Strategic Studies from Royal Roads Military College and earned an MA in War Studies from the Royal Military College, completing his thesis on the 2d Tactical Air Force in the Normandy campaign. He has served in Germany, the Middle East, and various headquarters billets. His writings have been published in a wide variety of journals including Parameters and the RAF Air Power Review.

American airmen all came to the war with essentially the same doctrinal tenets as those the British were espousing in North Africa. What happened, in Mets' view, was that the prestige the British had won with their victories since El Alamein lent weight to this view of tactical air power. The U.S. airmen drew upon this British reputation in order to convince their Army masters of the basic tactical air principles they already believed for their own reasons.⁹

Is the nativist school of thought correct? Doubtless in their specific assertions they are, for the U.S. had not completely ignored tactical air power in the interwar years and had inculcated the basic doctrinal tenets for tactical air power prior to their arrival in North Africa. However, it is important to distinguish between two related but separate issues: an air force's broad philosophy for air power on the one hand, and an actual system for implementing that philosophy on the other. Most of the historical debate has been focused upon the former, while ignoring the latter. The American nativist school's argument boils down to the assertion that the broad philosophy contained within FM 100-20 did not have to be learned from RAF tutors. This is doubtless true, but it relates more to broad philosophy than concrete system. As the air power historian Vincent Orange observed, even after FM 100-20 was published, "communications links and procedures for setting priorities in answering calls for air support had still to be worked out."¹⁰ The record suggests that at this more concrete level, the American practice of tactical air power was indeed strongly influenced by the British model.

What Was the British System and Where Did It Come From?

If we are to determine the British influence on U.S. tactical air power, the first thing to nail down clearly is the history of the British development of their system for air support. As we shall see, it was long and convoluted, but there are no records suggesting a U.S. influence on the British.

What would come to be called "tactical" air power was in fact the primary focus of British air experience in the Great War.¹¹ However, after that early start cooperation with the Army quickly deteriorated. Right from the RAF's birth in 1919, there were inter-service rivalries with the two older services that were far more pronounced and bitter than anything that had been seen before between the Army and Royal Navy.¹² A major factor at the root of this was the fervent belief of the RAF's founders that they had found a "better way" to win wars, and that, indeed, they had rendered the two older services obsolescent, if not obsolete. In the future, air power's new apostles argued that wars would be won not by massed armies or fleets, but by massed bombers, striking directly at the heart of any enemy's homeland. It has been widely noted that this sort of strategic bombing, as an instrument of state policy independent of the other two

services, was the *raison d'être* for the RAF at its birth.¹³ In consequence, until the mid 1930s, the RAF gave scant attention to air support of armies in the field.¹⁴ Even when the British government began seriously to rearm in the second half of the 1930s, the Air Ministry steadfastly opposed War Office requests for dedicated air support.¹⁵ Army-RAF cooperation had scarcely improved by 1939. Convinced of the strategic importance of independent bombing, the Air Ministry continued to resist any "diversion" of resources from heavy bombers.

The fall of France did not greatly change the RAF's mind, but the Army could not be completely ignored and shortly after Dunkirk, "Army Cooperation Command" was formed. However, it came last in the RAF's priorities, and as late as the spring of 1941 the Chief of the Air Staff, was still officially arguing to Cabinet that: "The Army has no primary offensive role... We aim to win the war in the air, not on land."¹⁶

Fortunately, work to improve interservice cooperation and air support to ground forces had been proceeding at the lower levels, at least on technical matters. In neglected Army Cooperation Command, in the far backwater of Northern Ireland, a small group of officers had been brought together under the leadership of Group Captain Wann and Brigadier Woodall. Veterans of the recent debacle in France, both were determined to do better.¹⁷ They produced what came to be called the "Wann-Woodall" report, which outlined a system of control for air support that formed the basis of the eventual tactical air doctrine.¹⁸ The essentials of the Wann-Woodall system was the establishment of a joint Army-RAF headquarters which would control a composite force of aircraft, and the creation of a radio network outside of the normal Army chain-of-command specifically dedicated to air support. In their original report, submitted in December 1940, they envisioned this forward control of aircraft being effected through an organization they termed a "Close Support Bomber Control," which would be co-located with the army at corps level.¹⁹

The first implementation of these new ideas came in the Western Desert, far from the doctrinal squabbling at Whitehall. In early 1941, after the sobering experience of the Tobruk battles, the British leadership in the theater initiated a series of joint conferences between the army and RAF to review the problem of air support from first principles.²⁰ This resulted in a system similar to the Wann-Woodall proposals, which the local RAF and Army forces then reorganized themselves to actually test and implement. On September 30, 1941, this culminated in a directive on "Direct Support" which was published jointly by the RAF and British Army in the Middle East.²¹ This spelled out a system whereby the sort of forward communications detachments envisioned in the Wann-Woodall report were controlled by what was now labelled an "Air Support Control" or ASC, once again at corps level.²² These communications detachments were commonly known as "tentacles," since this was what they so resembled on the radio network orga-

ANNEXURE 'A' TO APPENDIX 7

COMMUNICATIONS FOR AIR SUPPORT CONTROL

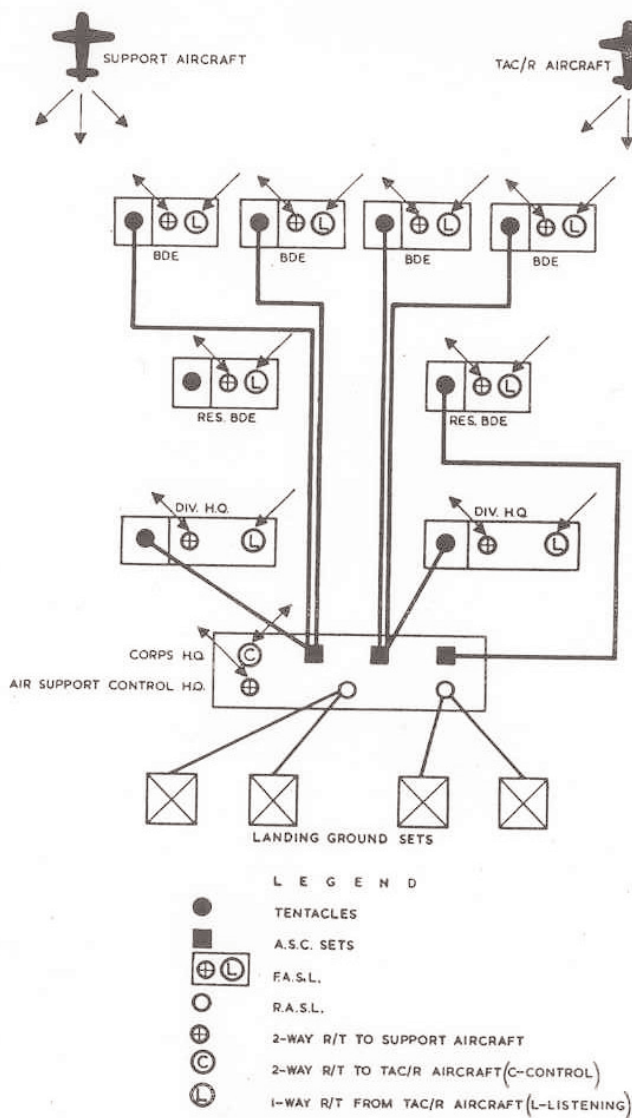


Diagram 1: The Development of the British System: Air Support Control, September, 1941 North Africa (Diagram reproduced in *Air Support*, p 219). Note how the ASC, as envisioned in 1941, worked at corps level. As seen in the main text, the eventual practice was to form a Joint Battle Room with a composite group at army level.

nization charts.²³ The cause-and-effect relationship between the Wann-Woodall report and developments in the North Africa is unclear, and given the records extant will probably remain so. One of the participants in the UK based development process has argued that the system was designed in the British Isles, based upon the Wann-Woodall report, and then lifted *in toto* to North Africa for application.²⁴ Most historians have concluded that while there must certainly have been influence from the Wann-Woodall developments in Britain, there was also independent parallel development in North Africa.²⁵ Regardless of the truth in this matter, the key point for our purposes is that there is no suggestion in the record of any influence from American theory.

By 1942, the system's final form was virtually complete, with the RAF elements operating in North Africa being organized into the Desert Air

Force or "DAF". In 1943, further elaboration of this system continued, not only in the North African and Tunisian campaigns, but in Sicily and Italy as well. In Italy, a system known as "ROVER DAVID" was developed. This was a means for arranging even faster and more responsive direct air support at the front than the ASCs could provide. A senior controller was sent forward with a signals truck equipped with VHF radios that could communicate with aircraft, and was allocated immediate control of some number of aircraft. The initial controller for this was one Group Captain David Heysham, hence the term "ROVER DAVID"²⁶ In November 1943 the ROVER DAVID system was used during operations along the River Sangro to control the first ever CABRANK.²⁷ This was a system in which a package of fighter-bombers circled overhead, available to swoop down upon a target as soon as the forward controller called for support.²⁸ To maintain a CABRANK, aircraft were sent to replace those that expended their ordnance or ran low on fuel, in a continuous relay. All aircraft were given an alternate target, which they would attack if not directed onto a target while in CABRANK.²⁹ The somewhat whimsical name CABRANK arose because of their resemblance to the ranks of cabs waiting outside London clubs and hotels.³⁰

The British System in its Mature Form

All of this experience by Montgomery's Eighth Army and the DAF was much studied, and in early 1944 it was distilled into the two publications *Army-Air Operations: Pamphlet No. 1—General Principles and Organization*, and *Army-Air Operations: Pamphlet No. 2—Direct Support*.³¹ These represented the authoritative doctrine for the British system in its mature form.³²

This doctrine was based upon what was known as the principle of "joint command." Under this principle, ground forces and air forces both retained separate chains of command, each with their own commanders. Both were expected, however, to cooperate in the furtherance of a single joint plan.³³

As regards the actual practice of air power, British doctrine distinguished between "indirect" and "direct" support. Indirect support was defined as "attacks on objectives which do not have immediate effect on the land battle, but nevertheless contribute to the broad plan."³⁴ Typically, this involved attacking enemy lines of communication and the like by heavy or medium bombers, but fighter-bombers could be used against such targets as well. Direct support, on the other hand, was defined as "attacks upon enemy forces actually engaged in the land battle."³⁵ Typical targets included such things as defensive positions or other enemy forces at the front, and hostile batteries of artillery or concentrations of armor somewhat behind the front. "Direct Support" is thus somewhat broader than the modern term "close air support," which did not appear in the official British terminology of 1944.³⁶ Direct support was further categorized on the basis

	Direct Support	Indirect Support
Pre-Arranged	<ul style="list-style-type: none"> - attack of targets in the immediate area, usually by fighter bombers - requests passed up normal command channels - routinely pre-arranged for the next day at the evening air conference 	<ul style="list-style-type: none"> - attack of deeper targets, often by medium bombers, but also by fighter-bombers - requests passed up normal command channels - routinely pre-arranged for the next day at the evening air conference
Impromptu	<ul style="list-style-type: none"> - attack of targets right at the front, usually by fighter bombers - requests made by radio direct from forward controllers to Composite Group level - response time of several hours to a few minutes (with a CABRANK) 	<ul style="list-style-type: none"> - strictly speaking, all indirect support was pre-arranged, but there were a few occasions on record of it being organized for later the same day

Table 1: Summary of British Doctrinal Types of Air Support

of urgency, distinction being made between “impromptu” and “pre-arranged” requests for air support.³⁷ Pre-arranged attacks were planned through the staff process, sometimes weeks ahead of time, but routinely for the next day. Impromptu requests were originated in the heat of battle by leading army elements and sent via the special air request radio network created specifically to handle such requests.

So much for the abstract doctrine. What was the actual working system created to implement all of this? Traditional RAF organization was geared neither to close integration with the Army, nor to moving headquarters and airfields along behind an advancing front. A new organization, known as a “tactical air force” was therefore created for this purpose, and the 2^d Tactical Air Force (TAF), that fought in north-west Europe was the British epitome of this system. It consisted of a mobile headquarters that could follow the army group’s headquarters in the field, various groups, and a considerable service support tail consisting of everything from a field hospital to “Servicing Commandos” for repairing aircraft.³⁸ One group—No. 2—was a light bomber formation, dedicated to indirect support. Another of the groups—No. 85—consisted of Mosquito night fighters. The heart of 2d TAF, however, were the two “composite groups,” each with seven or eight wings of three to four squadrons of fighter-bombers. The actual flying squadrons of the composite groups were located at airfields as close to the front as possible. Indeed, each composite group had integral engineering units specifically for the purpose of building airfields just behind the advancing armies.

There was also a special radio network to handle the air support requests in a timely fashion. For this Air Support Signals Units or “ASSUs” were created, one for each field army-composite group pairing.³⁹ The backbone of the ASSUs were the “tentacles” that went forward to the leading formations. They were small detachments, normally mounted in a 1,500-weight truck, but sometimes in an armored vehicle. Equipped with army pattern radios and a small crew of three or four soldiers with a junior officer,⁴⁰ they passed the air support requests from the leading ground forces’ headquarters directly back to the joint Army-Composite Group headquarters.⁴¹ Standard tentacles did not,

however, have any radios that could communicate with aircraft. They were normally assigned to a division or brigade headquarters, never below brigade level, except occasionally in the case of reconnaissance regiments.

In accordance with the principle of joint command, each army headquarters was paired with a composite group headquarters, and these would collocate. Thus situated, the army-composite group headquarters formed a “joint battle room.”⁴² It was in the joint battle room that joint army-air force consultation was routinely performed to prioritize fighter-bomber missions and issue direction. This, at army rather than corps level, was the final form of what had originally been the CSBC or ASC.

Each of the Composite Groups also had an organization known as a Group Control Center (GCC). This was the air organization that actually directed and controlled the flying aircraft. The GCC would scramble planes, and vector them to their targets, just as the static Sector Headquarters had done so famously during the Battle of Britain. The GCCs were also the organizations within 2d TAF responsible for monitoring their airspace and ensuring the maintenance of air superiority within that area.⁴³

Additionally, aside from the basic tentacles, there were specialized tentacles, including VCPs (Visual Control Posts), FCPs (Forward Control Posts) and contact cars, depending upon their exact configuration and equipment. These had grown out of the ROVER DAVID system in Italy, and were essentially standard tentacles to which additional radios and personnel were added, so that they were able to communicate with overhead aircraft and call down airstrikes directly. (See glossary, pg. 30.)

Within the Army, a new sort of specialist officer was created for this system—the Air Liaison Officer (ALO). This was an officer from one of the combat arms of the Army, trained in the principles and procedures of air support.⁴⁴ ALOs were used in FCPs, VCPs and contact cars, and back at the airfields to brief the pilots on the ground situation before they took off.

So, we have seen the British doctrine and the elaborate organization for tactical air power. How was it actually done? Joint RAF-Army staffs dedicated to planning and coordinating air support existed at two levels: the paired headquarters of 21st Army Group-2d TAF, and at each paired army-composite group headquarters. At the level of headquarters, 2d TAF and 21st Army Group, the process was generally dedicated to overall direction. The heart of the organization for tactical air support lay at the army-composite group level. Direct air support was generally delegated down to this level, and it was there that impromptu requests were dealt with.

Pre-arranged air support

The center of the process for planning pre-arranged air support was the daily air conference at army-group headquarters.⁴⁵ These were large

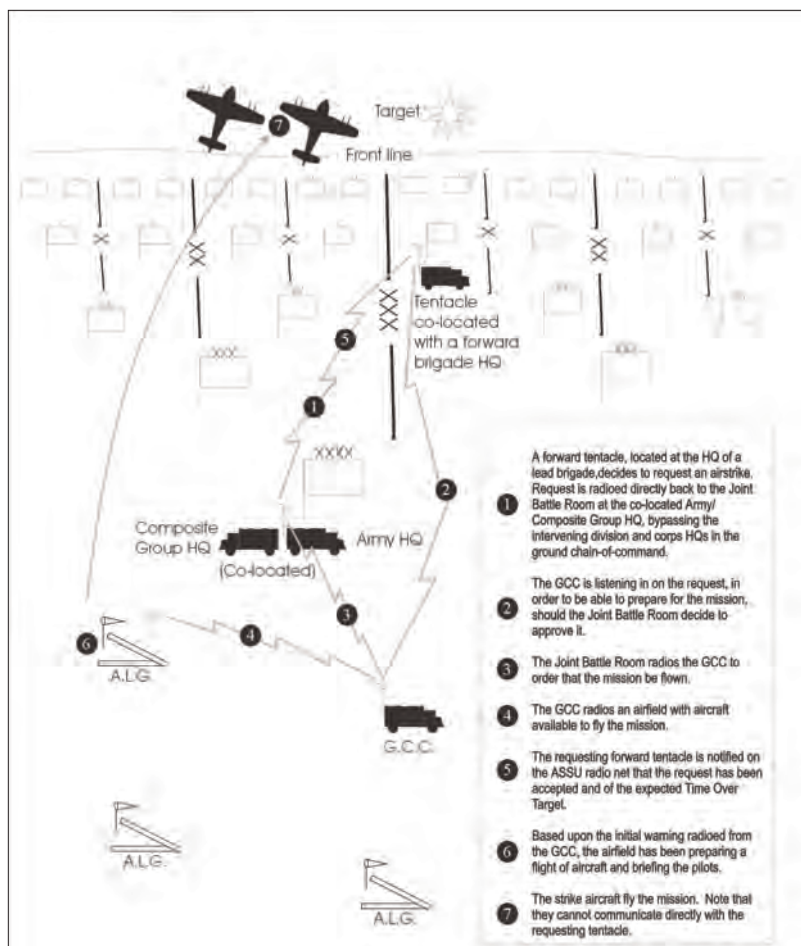


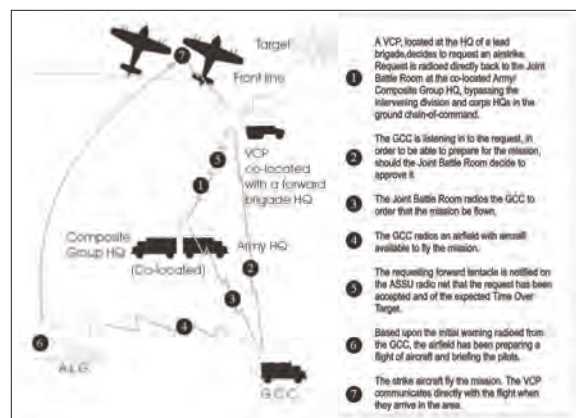
Diagram 2 (above):
The British System:
Impromptu Air Strikes with
a Standard Tentacle. The
diagram portrays the sim-
plified lay-out of a field
army on the ground, with
its associated composite
group in support. The
headquarters of the com-
posite group and the army
are co-located, and the
army has two corps up,
while the composite
group's Air Landing
Grounds (ALGs), each typi-
cally housing a wing, are in
the army's rear area.

Diagram 3 (above right):
The British System:
Impromptu Air Strikes with
an FCP or VCP. When an
actual forward controller
(an RAF pilot who could
communicate with over-
head aircraft by VHF radio),
as opposed to a standard
tentacle, was present,
the system could work much
more flexibly and respon-
sively.

affairs, chaired by the army headquarters Chief of Staff. They were held in the late evening, after which orders for the flying wings would be issued by the group headquarters, usually by teleprinter.⁴⁶ Additionally, specific conferences would be called as necessary to produce "Air Programs" for major operations.⁴⁷

Impromptu Request Procedure

Immediate close support in the heat of battle was provided by the impromptu system. The tentacles, often forward with the lead brigades, passed requests for air support through the ASSU radio network, directly back to group-army headquarters, without passing through the intermediate divisional and corps levels of command. The army-composite group staffs would then either authorize or deny the request.⁴⁸ The GCC, meanwhile, would also be listening in on the same net, concurrently directing the preparation of aircraft, in order to be ready should the request be approved. Thus, immediately upon authorization, aircraft could be dispatched. The forward tentacle which had initiated the request would be notified through the ASSU net that aircraft were on their way, and their estimated time of arrival.⁴⁹ If a VCP was forward in the target area, it could establish radio communications with the strike aircraft and talk them onto target. If there was no VCP or FCP present, the Army had to simply wait for the expected air strike.



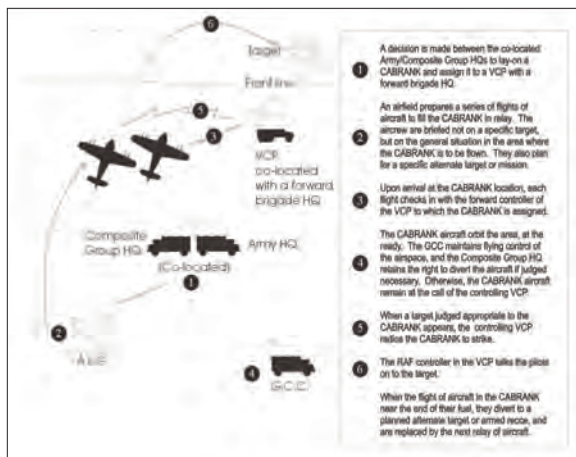
If an FCP (or VCP) was forward in the target area, it could shorten the authorization process and improve the communications between the ground formations and the aircraft overhead. FCPs could fulfill many of the roles of both the army-composite group headquarters and the GCC. Generally, the FCP would co-locate with the headquarters of the lead or priority corps within the army, and there "listen in" on the calls for impromptu air support from the forward tentacles with that corps' lead elements.⁵⁰ If the FCP commander, in close consultation with the corps commander, heard a request which he considered sufficiently important, he would "step in" and assume control of that request.⁵¹ The FCP, which was also in communications with the GCC and all flying aircraft in the area, could direct any aircraft assigned to it to that mission. RAF pilots with the FCP would establish communications with the strike aircraft and brief their pilots on the mission over the radio.

Thus, pre-arranged attacks were staffed through the normal chain-of-command, and impromptu requests were made on the spot by front-line commanders, through the forward tentacles. However, pre-arranged and impromptu were not entirely distinct. The principal bridge between the two was the CABRANK system, which amounted to a pre-arranged placing of aircraft at a specific time and place in order to be immediately available for impromptu support.

The response time for pre-arranged air support thus varied from plans drawn up days or even weeks ahead of time, to routine requests for air support the next day. The timeliness of response to impromptu requests varied as well. Generally, impromptu requests took about one to two or three hours from request to the appearance of aircraft over target, depending upon circumstances.⁵² At the other extreme, if there was a CABRANK available, aircraft could be diverted onto the target even more quickly, sometimes within minutes.

But the most common form of ground attack was not called in by any form of forward control. The most common mission type for fighter-bombers was actually "armed reconnaissance", or "armed recce" as it was commonly known. This was a mission type in which fighter-bombers patrolled a given route or area behind German lines. They would range widely, collecting valuable intelligence and attack-

Diagram 4: The British System: CABRANK. The epitome of the British air support system was CABRANK, which allowed extremely rapid response. It could only be done when a VCP or FCP was present, and a sufficient quantity of aircraft were available.



ing any targets of opportunity, with bombs, rockets or guns.⁵³ This was the mission type that led to so many shot-up German columns on the Norman roads, and it came to be perhaps the most important mission type of the campaign. The RAF firmly believed that the deeper and more free-ranging armed recon missions were a far more effective and worthwhile utilization of tactical air power than close support missions at the front, and devoted the majority of their sorties to this mission type.⁵⁴

The Evolution of the U.S. System

So, if that was the British system, how does the U.S. system compare? As we shall see, the history of the development of the U.S. system for tactical air power is more difficult to piece together, but several things are clear. First, as we saw above, it is clear that the U.S. did not ignore tactical air power or allow it to languish in the interwar period—unlike the RAF who really did ignore tactical roles. Secondly, while there is no particular evidence indicating U.S. influence on either of the key points from which the British system derived (the Wann-Woodall report and the conferences in North Africa), there is clear documentary evidence of British influence on the US.

As with the British, tactical air power had strong roots in U.S. practice, going back to the First World War. In that conflict, the U.S. air arm was employed mostly in tactical roles.⁵⁵ This experience was captured after the war by officers such as William “Billy” Mitchell, Edgar Gorrell, and William Sherman, all of whom by 1920 had produced various works that codified the wartime experience.⁵⁶ Reflecting the Great War experience, they all placed the Air Service firmly in tactical support of the ground forces. In 1922 the War Department published TR (Training Regulation) 440-15, *Fundamental Principles for the Employment of the Air Service*, which explicitly directed that ground commanders retained command over support aviation.⁵⁷

After that spurt of development in the early 1920s came the long, slow interwar years. While there was comparatively little development in this period, as noted above new types were introduced, and in 1935 TR 440-15 was updated somewhat. But in 1939, the outbreak of the war in Europe truly

focused minds. The U.S. Army was frankly dazzled by the close cooperation between the panzers’ and the “stuka” dive-bombers, seen so dramatically in Movietone News clips. The Air Corps quickly contacted the U.S. Navy for help with a crash dive-bomber program, and took other steps to re-energize the tactical air power program.⁵⁸ On April 15, 1940, a new manual was published, FM 1-5 *Employment of the Aviation of the Army*, which was short and prescribed few specifics.⁵⁹ However, the Air Corps was in close contact with the British, to follow the developments there growing from the Wann-Woodall Report. The North African strand of British development also reached the Americans; a copy of the British “Directive on Close Support Bombing” of December 6, 1940, was “strongly” endorsed by U.S. Army Air Corps commander Gen. Henry H. “Hap” Arnold.⁶⁰ In April 1941, General Arnold visited the UK to see for himself how the new British system for close air support worked.⁶¹ He had been preceded in 1940 by then Brig. Gen. Carl A. “Tooey” Spaatz, who had spent an extended stay in Britain, primarily to observe fighter air defense operations, but he was also probably exposed to the Wann-Woodall report and ongoing development of tactical air power as well.⁶²

By this time, U.S. tactical air power doctrine had entered a period of intense development, as was U.S. rearmament generally. The year 1941 was dominated by a series of large scale maneuvers designed to test new ideas, both of mobile warfare on the ground, and tactical air warfare from above, very obviously strongly influenced by events in Europe and North Africa. In fact, it would appear that at Arnold’s behest the basis for the organization tested in these manoeuvres was the British “Directive on Close Support Bombing” of December 6, 1940.⁶³ The manoeuvres began in February with exercises by the IV Corps under Maj. Gen. Benedict with the 3d Bombardment Group (Light) in support, commanded by [then] Maj. Gen. Lewis Brereton. This resulted in the “Benedict-Brereton” Report, and on 29 August this was translated into Training Circular (TC) No. 52, which formed the basis for further manoeuvres at Fort Knox, Louisiana and finally South Carolina, in which trials were extended up to the army level of command. All of this culminated in the publication of Field Manual 31-35 *Aviation in Support of Ground Forces* (FM 31-35), in April 1942.⁶⁴

These trials, based in large part upon British practical experience, meant that by the time the U.S. entered the war after Pearl Harbor, the lessons of the British ASC system for tactical air power had been fully digested. Tellingly, the term “ASC” does not appear at all in FM 1-5 (April 1940), and while it is unclear from the records extant exactly when it was imported into U.S. use, it is clear that it first appears in the historical record in British use in North Africa and was then imported to the U.S.⁶⁵ FM 31-35 (April 1942), officially enshrined ASCs in U.S. doctrine (using that very term).

Thus, it is true that the U.S. entered North Africa with doctrine for tactical air power that was

MITCHELL,
GORRELL,
AND
SHERMAN ...
ALL PLACED
THE AIR
SERVICE
FIRMLY IN
TACTICAL
SUPPORT OF
THE GROUND
FORCES

WHAT THE WRITTEN U.S. DOCTRINE DID FOCUS ON WAS THE CONTENTIOUS ISSUE OF COMMAND ARRANGEMENTS

not greatly altered by experience there or by the subsequent publication of FM 100-20. However, the doctrine in FM 31-35 was clearly influenced by the British model, going back to the ideas of the Wann-Woodall report, the 1940 "Directive on Close Support Bombing" that Arnold endorsed, and the ASC concept, which had been imported from the RAF Middle East practice.

FM 31-35 outlined the system with which the U.S. entered the fighting. This was later augmented by the much more famous FM 100-20, which was published in 1943 and reflected (or claimed to reflect) the experience in North Africa.⁶⁶ However, both were rather abstract and neither spelled out a great deal of specifics. FM 31-35 is 65 pages, but this includes an index, appendices, and a great deal of secondary material on communications procedures and auxiliary missions such as photo reconnaissance. Less than a dozen pages are devoted to general principles and the primary issue of ground attack, including what guidance it provides on targeting and mission types.⁶⁷ FM 100-20 is even shorter—the entire publication is only 14 pages from cover to cover and it addresses (however briefly) everything from strategic bombers to the administrative and logistic support provided by Air Service Commands. Perhaps in consequence of this brevity, U.S. doctrine (or at least, U.S. *officially published* doctrine) lacked a clear systemization of tactical air power into categories such as direct and indirect support, or pre-arranged and impromptu, as found in British doctrine.⁶⁸ What the written U.S. doctrine did focus on was the contentious issue of command arrangements, and some prescriptions for prioritization of operations.

FM 31-35 had rather little to say about targeting, or what role tactical air power might play in the campaign, other than to note that targets should generally not be within the range of the ground forces' own weapons, and that "the most important target ... will usually be ... the most serious threat to the ... supported ground force."⁶⁹ Final authority for target selection was expressly given to the supported ground force commander.⁷⁰ FM 100-20, on the other hand, introduced a clear hierarchy of priorities for tactical air power. The top priority was to be gaining and maintaining air superiority; secondly deep interdiction meant to isolate the battle area; and finally as the last priority, close air support.⁷¹

As regards organization, FM 31-35 specified that at the top end of the organization, all available air power in a theater should be centralized within one "air force," but that tactical air power would normally be grouped into what it termed "air support commands," which would be "habitually attached to or support[ing] an army in the theater."⁷² Within these Air Support Commands, were to be ASCs. FM 31-35 placed them at corps level, or occasionally down to armored divisions.⁷³ At the bottom end of the chain, air support parties (or "ASPs") were to be found at corps and divisional level with infantry formations, or down to regimental level in armored (and cavalry) formations.⁷⁴ These ASPs were de-

fined as "highly mobile groups composed of one or more air support officers and necessary personnel and equipment to transmit air support requests ... and to operate communications with aircraft in flight."⁷⁵ Air Support Commands were thus analogous to Composite Groups in size, structure and role. ASPs were analogous to the British forward tentacles, albeit with the significant technical difference that they were able to communicate directly with overhead aircraft.

Development did not stop there of course. Indeed, in Italy the USAAF further copied British practice when they instituted the ROVER JOE system, which as the name makes clear was explicitly based upon the RAF system of ROVER DAVID.⁷⁶ More significantly, the command and control system spelled out in FM 31-35 was modified for the eventual OVERLORD campaign in North-West Europe. The ASC function was elevated to the army headquarters level.

The U.S. System in its Mature Form

The eventual American system was not as explicitly articulated in doctrine as the British. What was formally articulated appeared in the two key publications FM 31-35 and FM 100-20 we have already seen. However, neither prescribed a great deal of specifics, and in fact some of the specifics in FM 31-35 were superseded in eventual practice. For the OVERLORD campaign, what FM 31-35 had termed "Air Support Commands" were known as Tactical Air Commands, universally known as "TACs."⁷⁷ More substantively, FM 31-35 prescribed that ASCs⁷⁸ should exist as an intermediate level of command for air support requests between the ASPs at the front and the Air Support Command (or TAC as they were eventually known) at army level. As mentioned, FM 31-35 described ASCs as placed at corps level, and that they would be able to action requests from the forward ASPs without further reference to the Air Support Command-TAC at army level. In subsequent practice, the ASC function was merged with the TACs at army, although the doctrine for them contained within FM 31-35 was never formally rescinded. The Standard Operating Procedures for the TACs in northwest Europe prescribed a system in which immediate call requests from the ASPs at the front went straight to the TAC-Army headquarters. In fact, not bothering with formal doctrine represents a feature of U.S. practice; by 1944 they worked straight from SOPs.

For the actual OVERLORD campaign, the USAAF formed a tactical air force to support the land campaign—the Ninth Air Force, commanded initially by Lieutenant General Brereton, subsequently by Maj. Gen. Hoyt S. Vandenberg. It consisted of about a hundred squadrons of combat aircraft, its primary components being a Bomber Command of mediums and several TACs of fighter-bombers, plus the associated servicing organizations required to support such a force. The TACs consisted of twenty to thirty squadrons of fighter-

ASIDE FROM REQUEST MISSIONS, BY 1944, THE USAAF WAS PRACTICING ARMED RECCE, JUST AS WAS THE RAF

bombers, and were “paired” with ground formations at the army level. The Ninth Air Force itself was paired with 12th Army Group, and IX TAC was paired with 1st Army. XIX TAC was paired with 3d Army. Pairing in this fashion did not extend lower down the chain of command.⁷⁹

Gen. Omar Bradley’s 12th Army Group headquarters and Brereton’s Ninth Air Force headquarters were co-located. The various army and TAC headquarters were, as a matter of principle, co-located and between them they formed what was initially termed an Air Support Control Center, and subsequently a Combined Operations Center. This was analogous to the Joint Battle Room in the British system, and this was the level at which requests for air support arrived, were jointly considered by the ground and air staffs, prioritized, and orders issued.

Each TAC also had an organization dedicated to flying control of its aircraft, the Tactical Control Center (TCC). It received an air picture from mobile radar units deployed just behind the front lines, and maintained radio control of all aircraft in its area. TCCs were manned with USAAF personnel, and were not co-located with the joint army-TAC headquarters.

Below army level, the Americans employed the ASPs conceptually described in FM 31-35.⁸⁰ ASPs were permanently attached to every Army formation headquarters, right down to divisional level, but they were manned from Ninth Air Force personnel. Most significantly, the actual ASP officer, or “ASPO,” was a tour-completed fighter-pilot. All ASPs were equipped with VHF radios for communication with aircraft, but they varied in size and configuration. (See glossary, pg. 30.)

The actual flying squadrons of the TAC were based in forward strips as close behind the front as practicable. Also at the airfields were “Ground Liaison Officers” or GLOs. These were liaison officers from the ground forces who were responsible for monitoring front-line developments through army ground forces channels. Before the pilots took off for missions, the GLOs would brief them on the ground situation.⁸¹

Just as the British distinguished between pre-arranged and impromptu missions, so did the Americans, although—as noted above—this was not actually articulated in their formal doctrine. Perhaps as a result of this, there is a sometimes confusing welter of terms in the contemporary documentation. Pre-arranged missions are variously referred to as “planned,” “pre-planned” or “request” and impromptu missions as “immediate request,” “emergency call” or simply “call” missions. The IX TAC Standard Operating Procedures for ASPs, as of August 3, 1944, actually differentiated between three categories of air support.⁸²

A Planned Mission is a mission which will be flown on a day or days subsequent to the day of request.

A Request Mission is a mission which will be flown during the current day’s operations but which is not

an Immediate Request Mission.

An Immediate Request Mission is a mission which will be flown as expeditiously as possible.

Planned missions were normally requested up the ground chain of command until they reached the Army-TAC level, and were then considered at a daily air conference held every evening. These meetings were large affairs, conducted jointly by the army headquarters operations staff with the TAC headquarters, at the end of which flying orders for the next day were drawn up and disseminated to the flying squadrons by teletype.⁸³

Requests for immediate support, generally known as “call” missions, were passed directly from the ASPs to the Combined Operations Center.⁸⁴ There, a decision was made in consultation with the Army G-3 (Air), TAC A-3 and their staffs as to whether the target merited allocation from available resources, and whether it fit within the Army’s concept of operations. If accepted, the TCC would be ordered to scramble aircraft. Alternatively, aircraft already airborne in the area could be redirected. In either case, the TCC was responsible for the flying control of all aircraft in the TAC’s area.⁸⁵ Upon arrival over the target area, the strike aircraft would “check in” with the requesting ASP, and receive final guidance.⁸⁶ This was of course a significant advantage for U.S. ASPs over standard British tentacles, as the latter could not communicate directly with the overhead aircraft. As regards the response times, this obviously varied with circumstances. Brig. Gen. Elwood “Pete” Queseda, the commander of IX TAC, estimated that his aircraft could fulfill an immediate request mission in 60 to 80 minutes.⁸⁷ Other accounts suggest that the response time was often somewhat more.⁸⁸ Overall, it would seem fair to say that in ideal circumstances an air strike could be delivered in about an hour, but that often, of course, circumstances were less than ideal and it took a couple of hours or so to get bombs on target.

Aside from request missions, by 1944, the USAAF was practicing armed recce, just as was the RAF. This represented something of a wartime innovation in that interwar U.S. theory had stressed that all attack missions should be planned, since it would be inefficient and wasteful to send out missions on speculation.⁸⁹ In the event however, a considerable portion of Ninth Air Force’s sorties were devoted to this mission type.⁹⁰

The other major innovation of the campaign was what came to be termed “Armored Column Cover” or sometimes simply “Column Cover.” This was a system whereby an ASP was mounted in an actual Sherman tank and travelled with the leading armored columns. Fighter-bombers were then kept in orbit overhead, in direct communication with this tank mounted ASP, and thus available for immediate attack of close targets or to conduct armed recce forward from the column’s position. The procedure was for the flight lead to check-in by radio with the ASP controlling them, usually one of

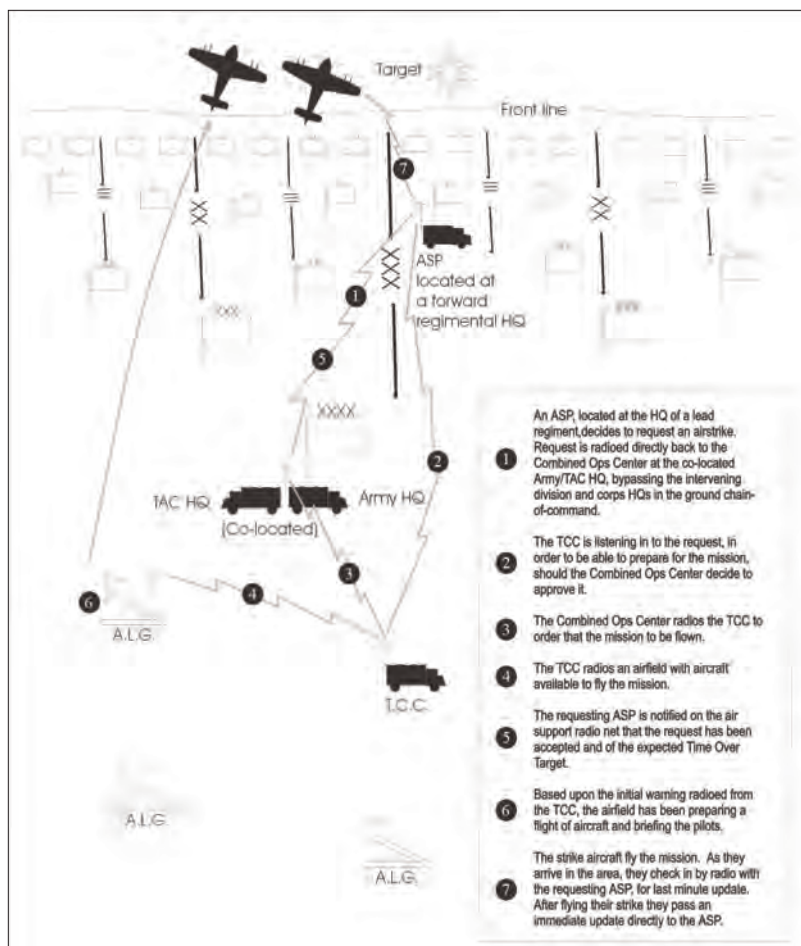


Diagram 5 (above): The U.S. System: Immediate Call Missions. The diagram portrays the simplified lay-out of a field army on the ground, with its associated TAC in support. The headquarters of the TAC and the army are co-located, and the army has two corps up, while the TAC's ALGs, each typically housing a group, are in the army's rear area. Compare with Diagram 2.

Diagram 6 (above right): The U.S. System: Armoured Column Cover. The epitome of the U.S. system, armoured column cover allowed not only extremely rapid response, but offensive reconnaissance in direct support of the advancing troops. It was normally controlled from a tank mounted ASP with the advancing CC.

the special tank mounted ASPs at the tactical headquarters of a CC. The flight would then reconnoitre up to 35 miles ahead of the column, staying in radio contact with the ASP, thereby providing immediate air reconnaissance information to the CC, and attacking any German forces the CC commander wished. Typically, a flight could stay on station for about an hour before fuel considerations would require them to break-off. If no call mission was requested of them during that time, they would then proceed on an armed recce mission to find a target on which to expend their weapon load.⁹¹

Comparison

So where does all of this leave us? Are the two systems as similar as one would expect if one had been influenced by the other? Let us look first at the differences. Essentially, these were to be found in two areas: the more abstract doctrine and the greater technical resources inherent in the U.S. system.

The principal doctrinal differences between the U.S. and British lay first of all in the more fully articulated nature of the British doctrine, and secondly in the more rigidly doctrinaire prescription for targeting priorities laid out in FM 100-20. The comparative paucity of formally promulgated U.S. doctrine has already been commented upon.



Really, they had no published equivalent to the two British pamphlets *Army-Air Operations*. The U.S. terms for pre-arranged and impromptu air support do not even appear in FM 31-35 or FM 100-20. But the more significant doctrinal difference between the U.S. and Britain lay in FM 100-20's rather rigid insistence upon arranging targeting in a strict hierarchy: air superiority first, deep interdiction second, and close air support only third.⁹² In fact, so rigid was this prescription that the term "phases" came to be used to describe them.⁹³ In the event, this prescription was not really followed by Ninth Air Force—they pursued multiple efforts more or less simultaneously.⁹⁴ Indeed, it has been suggested that FM 100-20 was really more a product of the bureaucratic wars in Washington than the shooting wars in Europe and the Pacific.⁹⁵

One of the greatest differences between the two systems lay in the nature of the forward control elements. In the British system, the forward controllers were part of the ASSUs, which amounted to a centralized pool of forward controllers held at army level. Tentacles, VCPs and FCPs were then farmed out to formation headquarters along the front for short durations, as required. U.S. ASPs, on the other hand, were permanent parts of every corps and divisional headquarters. Most strikingly of all, standard British tentacles had no means of communicating with aircraft overhead, whereas each and every U.S. ASP was capable of this. In essence, every U.S. corps headquarters had what amounted to an FCP, and every divisional, CC and some regimental headquarters had what amounted to a VCP. Another difference was that in the British system the ASSUs and forward tentacles were manned with Army personnel (with the exception of any actual controllers in FCPs and VCPs), whereas in the U.S. system all of the ASP crews came from Ninth Air Force personnel.

There was one other striking difference between the two systems, and that was the American innovation of the system of armoured column cover. A great deal of folklore surrounds the development

RAF	USAAF
2nd TAF paired with 21st Army Group	9th Air Force paired with 12th Army Group
- paired with an Army Group	- paired with an Army Group
- commanded by an Air Marshal (Lieutenant General equivalent)	- commanded by a Lieutenant General
- approx 85 sqns of combat aircraft	- approx 100 sqns of combat aircraft
Composite Groups	Tactical Air Commands (TACs)
- paired with Armies	- paired with armies
- commanded by an Air Vice Marshal	- commanded by a Brigadier General
- 25-30 squadrons of fighter-bombers	- 20-30 squadrons of fighter-bombers
Combined Operations Center	Joint Battle Room
- formed between Composite Group and Army headquarters' staffs	- formed between TAC and Army headquarters' staffs
- served as the focal point for accepting/rejecting air support requests	- served as the focal point for accepting/rejecting air support requests
Group Control Centre	Tactical Control Center
- control element to coordinate defence of airspace and control aircraft in flight	- control element to coordinate defence of airspace and control aircraft in flight
Forward tentacles, including FCPs and VCPs, with corps, division or brigade headquarters, occasionally down to the level of battalion headquarters	ASPs with corps, division, CC/Infantry Regiment headquarters, occasionally down to the level of battalion headquarters
Daily Planning Conference	Evening Air Conference
Pre-arranged missions	Pre-planned missions
Impromptu missions	Call missions
Armed Recce	Armed Recce
CABRANK	Armored Column Cover
Response Times:	Response Times:
- routine requests typically for next day	- routine requests typically for next day
- impromptu requests approx one to two hours	- call requests approx one to two hours
- with CABRANK, as little as a few minutes	- with Armored Column Cover, as little as a few minutes

Table 2: Side-by-Side Comparison of British and U.S. Systems

of armored column cover; it is almost always attributed to the personal invention of either IX TAC commander General Queseda, or even to Bradley himself.⁹⁶ These claims are often accompanied with folksy stories of how the initial tank to be converted into an ASP kept getting turned back from IX TAC because everyone believe it had to be an error that an air formation was requesting a *tank*.⁹⁷ Certainly, the decision to mount an SCR 522 radio in a Sherman tank was a field expedient developed for Operation COBRA. However, the innovation of putting an ASP into a Sherman tank—while clearly an excellent idea—was not logically necessary for the system of armored column cover. A standard ASP in a truck or jeep could perform the same function, i.e. the close control of a dedicated flight of fighter-bombers. In fact, this is exactly what was done with the earlier “veeps,” as jeeps with VHF radios were known.⁹⁸ Furthermore, there is a clear relation between armored column cover as practiced with such success from shortly after COBRA and the RAF’s pre-existing CABRANK system, of which all of the senior U.S. commanders—both Queseda and Bradley in particular—were fully aware. Even the mounting of an ASP in a Sherman was not without precedent. The British mounted their VCPs in armored vehicles, usually half-tracks but sometimes tanks, and the first British use of a VCP was on July 18, a full week before COBRA.⁹⁹

Many of the more breathless accounts of

armored column cover describe the tank mounted ASPs as being in “the lead tank in each armored column.”¹⁰⁰ This is both inaccurate and misleading. In fact, the standard practice for tank mounted ASPs was for them to be attached to a Combat Command (CC), where they were normally located with that CC’s headquarters; when they went “forward with the lead columns” it was to a tank battalion’s headquarters.¹⁰¹ That is quite far forward enough for it to have been logical and prudent to mount the ASP in a Sherman, but it is not quite the very point of the advance—it is in fact three or four echelons of command back from the point tank.¹⁰²

To be fair, armored column cover was more than a simple copy of the CABRANK system—it was a legitimate improvement upon RAF practice. Armored column cover was not only more frequently employed by the USAAF than CABRANK was by the RAF (which probably reflects the greater material resources available to the Americans), but it was also far more flexible. Armored column cover aircraft ranged ahead much more freely and aggressively than CABRANKs, who tended to orbit behind their forward controller.

Notwithstanding these differences, by the summer of 1944 the Anglo-American forces had a remarkably uniform organization and practice for tactical air power. Second TAF of the RAF and Ninth Air Force of the USAAF were much more similar to each other than the ground forces of the U.S. Army were compared with the British Army, or even than the Eighth Air Force was with Bomber Command. The British and American doctrine may have been expressed somewhat differently, but in practice they operated essentially the same way. Overall, the similarities are strikingly exact, as a side by side comparison shows (see box). These similarities are too exact to be coincidence—either one was influenced by the other, or both were developed together.

Conclusions

The American development of a working tactical air power system went through a complex development process, with various influences across the Atlantic at different times. It is not now entirely possible to untangle the full cause and effect in this process. As air power historian David Mets has argued, much air power theory in that era was “corporate knowledge,” common among the leading airmen of both Britain, the U.S., and other nations, but not necessarily written down in a way that allows modern scholars to dole out academic credit.¹⁰³ Nevertheless, a careful examination of the record—in particular the chronology of key developments—makes it clear that while the U.S. had cultivated a doctrinal background for tactical air power in the interwar years, this was rather broad and abstract. The actual working mechanism for tactical air power in the USAAF was developed in the rush to mobilize during 1941 and 1942. Cause and effect during that concentrated period are difficult to pin down from the records extant.

Date	US	Remarks
WW I	US Air Service goes to war with AEF	Their primary experience is in what would later be termed "tactical air power."
23 Dec 1918	"Provisional Manual for Operations of Air Service Units" by "Billy" Mitchell	These manuals were essentially a codification of wartime practice, which was that tactical air power was subordinate to ground formation commanders.
June 1920	"Notes on the Characteristics, Limitations, and Employment of the Air Service" by Gorrell, (published as an <i>Air Service Information Circular</i>)	
1920	"Notes on Recent Operations" by Sherman, (published as an <i>Air Service Information Circular</i>)	
1922	"Fundamental Doctrine of the Air Service" drafted by school (which was then located at Langley).	This document, never actually officially endorsed, suggested centralization of air assets rather than distributing them under the command of various ground formations along the front. This, rather than the school's proposed "fundamental doctrine" (above), was formally adopted as official doctrine. It represented an orthodox interpretation based upon wartime practice.
1922	Training Regulation 440-15 <i>Fundamental Principles of Employment of the Air Service</i> (TR 440-15)	
15 October 1935	Revised TR 440-15 <i>Employment of the Air Forces of the Army</i>	
15 April 1940	Field Manual 1-5 <i>Employment of the Aviation of the Army</i> (FM 1-5)	Compromise document that had little long term effect.
6 December 1940	British directive on Close Support Bombing – subsequently endorsed by General Arnold and used as basis for trials in 1941 manoeuvres.	Describes system for air support, including the "Air Support Control" (ASC)
February-June 1941	Large scale manoeuvres to trial, amongst other things, such new theories as armored warfare and tactical air power.	- 3d Bombardment Group (Light) (Commanded by Brereton) - IV Corps (Commanded by Benedict)
July 1941	Brereton/Benedict reports on results of these trials.	
29 August 1941	Training Circular No. 52 (TC 52)	Based upon Brereton/Benedict Report
August 1941	Fort Knox manoeuvres	
September 1941	Louisiana manoeuvres	Further refinement of principles.
November 1941	South Carolina manoeuvres	
9 April 1942	Field Manual 31-35 <i>Aviation in Support of Ground Forces</i> (FM 31-35)	Based upon Brereton/Benedict report and the 1941 manoeuvres. Officially enshrined the ASC idea.
June 1942	First contingent of USAAF arrives in Western Desert	Commanded by Bereton, this force is initially mixed in with the RAF.
8 November 1942	TORCH – combined US/British invasion of N.W. Africa begins - XII Air Support Command and RAF 242 Group provide air contingent.	The TORCH air forces are decentralized (due mainly to geographic dispersion), but otherwise generally follow the dictates FM 31-35.
14-24 January 1943	Casablanca Conference.	Decision made to reorganize the British and American air forces in N. Africa.
18-22 February 1943	US defeat at Kasserine pass.	This defeat was often blamed upon an "incorrect" decentralization of air power, probably unfairly.
18 February 1943	N. African air forces reorganized into NATAF (North African Tactical Air Force)	The RAF's Desert Air Force (DAF) added to NATAF on 23 February, Coningham appointed commander. He centralizes and prioritizes targeting to emphasize air superiority.

However, we do know where the British system came from, and the fact of the matter is that there is no evidence of U.S. influence upon the early work by the British in the Western Desert, much less upon the Wann-Woodall report. It is recorded, on the other hand, that the U.S. sent observers to Britain—very senior ones—in that same time period, specifically to learn how tactical air power was developing. This can clearly be seen in the documented flow of information from Britain to U.S. circles, in particular copies of the Wann-Woodall report, the British "Directive on Close Support Bombing" of December 6, 1940 and Arnold's letter to Marshall recommending endorsement of the British practice. Admittedly this is all circumstantial, but it is very suggestive, and it is all one way—Britain to the U.S. Also circumstantial, but equally compelling, is the linguistic evidence. The very term "ASC" originated with the British (apparently in North Africa) and was carried from there back to the US, where it formed the basis for much of the air power trials in the 1941 maneuvers, and subsequently the doctrine in FM 31-35. Even more telling was the later U.S. adoption of the British expression "armed recon", rather than "armed recon."¹⁰⁴

Another key point is the way in which American practice in OVERLORD represented some extemporization from the formal doctrine promulgated in FM 31-35. The British, it should be noted, had explicit formal doctrine for the final form that Anglo-American tactical air power took in North West Europe. Significantly, the USAAF did not, but rather relied on SOPs. And the effect of those SOPs was to modify the official doctrinal prescriptions of FM 31-35 to bring U.S. practice into congruence with the official British doctrine (not the other way around).

A final point that perhaps bears mentioning is that this process of borrowing working practice from the British is exactly what those senior U.S. airmen who were there describe as having happened.¹⁰⁵ Even if the nativist school can convincingly argue that much of the original story of post-Kasserine reform was originally spread for interservice rivalry reasons, that cannot completely discount such frank admissions from respected senior airmen.

It perhaps bears repetition at this juncture that what we are really talking about here is the *concrete system* for executing tactical air power—not the broader *abstract principles*. The U.S. nativist school of thought is quite correct to point out that senior U.S. airmen were fully conversant with those broader and more abstract principles—almost certainly more so than the RAF had been at the start of the war. However, a concrete system to effect those broader and more abstract principles had to be developed. In this regard, there must have been some concurrent development going on. Nevertheless, the flow of influence was clearly from Britain to the U.S.

May 1943	Unnumbered booklet <i>The Air Force in Theaters of Operations: Organization and Functions</i> Includes the pamphlet "The Air Support Command"	Not widely distributed. - introduced 3 "phases": I – neutralization enemy air force II – isolation of battlefield III – close support of ground forces
10 July 1943	HUSKY – invasion of Sicily begins.	
21 July 1943	Field Manual 100-20 <i>Command and Employment of Air Power</i> (FM 100-20)	Short book mainly concerned to emphasize that all air forces in a theatre should be under a single air commander who is not subordinate to ground commanders, and that the first priority for this air commander should be gaining and maintaining air superiority.
3 September 1943	Invasion of Italian mainland	
late 1943 / early 1944	ROVER JOE system developed by US tactical air forces in Italian campaign.	Based upon RAF system of ROVER DAVID. The "rover" system clearly presages both CABRANK and Armored Column Cover.
early 1944	SOPs developed within 9 th Air Force for OVERLORD campaign	Diverge somewhat from the official doctrine of FM 31 -35, but do correspond with official British doctrine.
July 1944	Armored Column Cover with tank mounted ASPs introduced.	A system such as this was never envisioned in pre-war theory, but the US Army was immensely satisfied with it.

Table 3 (begins left and continues above) : Chronology of Developments in U.S. Tactical Air Power Theory and Practice

This leads to an interesting irony. In the inter-war years, the RAF almost completely ignored the

tactical role for air power, whereas the Americans did not. As some recent U.S. historians have demonstrated, the U.S. Army Air Corps did take its tactical responsibilities seriously and devote some considerable attention to battlefield applications of air power, something the RAF manifestly did not do. Nevertheless, when war came, it was the British (who had not contemplated the matter in the interwar years) who developed an effective system for applying air power in tactical roles. The Americans (who actually had thought about the issue in the interwar years) wound up heavily influenced by the British system at the practical level. If that strikes some American historians as an uncharitable interpretation of events, it can be put another way. When war broke out, the Americans already had a full doctrinal background for tactical air power theory, whereas the British were forced to play catch-up in a crash course from the Germans. Nevertheless, catch-up they did, and when they went on to develop a working machinery for applying tactical air power against an enemy army in the field, the Americans followed their developments with interest and wisely chose to learn from them, rather than "reinvent the wheel." Given the monumental challenge faced by the comparatively small Army Air Corps of 1941—mobilizing a massive force of citizen soldier-airmen in a short period of time—that was doubtless a wise decision. ■

An Army ground controller at his post.



Forward Control: Predecessors of the modern Forward Air Controller (FAC—a term that had not yet been coined in 1944) were the various sorts of forward controllers used by the British and Americans in late World War II.

The British:

By end of the North-West Europe campaign the British had a variety of forward control types. All belonged to the ASSU itself, constituting a central pool of forward control parties that were then temporarily attached to leading Army headquarters.

Standard Tentacles: These were small detachments, normally mounted in a fifteen hundred weight signals truck, but sometimes in an armored vehicle such as a White Scout car. Equipped with two “Canadian Number 9” type wireless sets, they had an effective radio contact range of about 40 kilometres. Three or four soldiers and a junior officer provided the crew. One of the tentacle's radio sets was to receive the latest air reconnaissance reports, and the other was to tie into the ASSU network and pass back air support requests. Standard tentacles did not have any radios that could communicate with aircraft. Nor could they communicate with the airfields or GCC. Tentacles were not attached below brigade level, except occasionally in the case of reconnaissance regiments.

FCP: Each Army/Composite Group had one Forward Control Post or FCP. The intent was to form a special team which could focus airpower even more quickly and closely on a critical sector of the front than the normal control procedure could provide. There was only one FCP within each Group/Army, and it was deployed to the corps headquarters deemed to be the priority for air support. FCPs were much larger than all other types of forward tentacles, generally consisting of approximately 10 personnel all ranks, mounted in at least two primary vehicles, either heavy trucks or M14 half tracked vehicles, plus usually a trailer and a jeep. The FCPs were equipped with both army type radios for the ASSU net, and VHF radios to speak with aircraft. Included within the FCP's staff were both RAF pilots and an Army officers in fairly senior rank. The RAF representative was a wing commander or group captain (lieutenant colonel or colonel) and experienced fighter-bomber pilot; the army representative was generally a major. Together, the pilot and Army officer were to advise the local ground commander (i.e. generally the corps commander) on the optimal employment of air support. Unlike the ordinary tentacles, with their VHF radio an FCP could talk directly with overhead aircraft, for a range of about 30 to 40 kilometres, allowing it to control aircraft overhead and talk them directly onto targets. Usually, the FCP could also communicate directly with the GCC and even the airfields, allowing it to call directly for aircraft.

VCP: Visual Control Posts or VCPs were an innovation introduced part way through the Normandy campaign, the first one being employed in Operation GOODWOOD on 18 July. Essentially a normal tentacle augmented by a fighter-bomber pilot and army officer with a VHF radio for communication with overhead aircraft, as the name implies they were meant for directing air strikes onto targets under the VCP's direct observation. The intent was for the RAF pilot to “talk” the strike pilots onto the target “using the language one pilot would use to another.” There were three VCPs in each Army/Composite Group, but they were not entirely successful, apparently because in practice they were seldom able to adopt positions that gave good observation of targets. In consequence, VCPs

came to be employed as de facto miniature FCPs, normally sited with the headquarters of leading divisions or brigades. VCPs consisted of a tank or White Scout car rigged with the required radio sets, and a total of five personnel all ranks.

Contact Car: A later innovation was the contact car. They were very similar to a VCP, being essentially a normal tentacle augmented with a VHF radio for communication with overhead aircraft. Coming with the VHF radio was an RAF wireless operator and an RAF pilot. However, unlike the VCPs and FCPs, in the case of contact cars this pilot was normally a reconnaissance pilot (as opposed to a fighter-bomber pilot). Reconnaissance pilots were used because the primary role of contact cars was not to direct air strikes, but rather to facilitate liaison between reconnaissance aircraft and leading Army elements; they also served to keep the RAF accurately informed about the location of the forward most friendly troops.

The Americans:

Corps ASPs: Integral to every US corps headquarters was a large ASP equipped with a lieutenant colonel ASPO, a dozen enlisted men to serve as radio operators, map plotters, clerks and driver/mechanics. In practice the lieutenant colonel's position was sometimes filled by a major. There was also meant to be a captain assistant to the ASPO, but this was never filled in any of the TACs during the campaign. Corps level ASPs were assigned a generous amount of communications equipment, including an SCR 399 type radio and a teletype. Transport included a two and a half ton truck for the radios, a “Veep” (jeep with VHF radio) and several ordinary jeeps and tents.

Divisional ASPs: The ASPs at divisional level were smaller, consisting one officer (meant to be a major, in practice sometimes a captain) and five to eight enlisted men. The officer was an ASPO, i.e. former fighter-bomber pilot, and his five troops were radiomen, technicians, and driver/mechanics.

Infantry divisions' ASPs consisted of an SCR 522 VHF radio mounted in a jeep and an SCR 522 VHF radio and SCR 399 mounted in the back of a two and half ton truck. Below the level of the divisional headquarters, infantry divisions had no other ASPs, with the exception of some arrangements made for the beach assault on D-Day itself. For that special day, ASPs were assigned to each of the Regimental Combat Teams in the assault. Throughout the rest of the campaign, in infantry divisions the ASPs normally operated at the divisional headquarters location, although the jeep mounted radio was sometimes sent forward for specific missions.

Armored divisions' ASPs varied widely in establishment, from a low of only the same two radio sets as an infantry division, to a high of 14 radio sets. In some cases this was achieved in part by detaching pilots and technicians on a temporary rotating basis from IX TAC, which created a de facto two additional ASPs for the division in question. These additional ASPs normally worked with each “Combat Command” (CC), sometimes even with the lead tank battalions. During the campaign itself, it was decided to mount some of these ASPs in armored vehicles, so as to be better able to accompany advancing armored columns. This was first done for Operation COBRA, and it subsequently became standard practice to maintain ASPs mounted in either half tracks, armored cars or actual Sherman tanks, fitted with standard VHF 522 radio sets, to work with armored division CCs.

1. T. Greer, *The Development of Doctrine in the Army Air Arm, 1917-1941* (Air Force Historical Study No. 89, 1953) p. 67.
2. Wesley Frank Craven and James Lea Cate (editors) *The Army Air Forces in World War II Vol. 1 Plans and Early Operations, January 1939 to August 1942* (Washington D.C.: Office of Air Force History, 1948 reprinted in 1983) pp. 36-37 and 69-71; Lee Kennett "The U.S. Army Air Forces and Tactical Air War in the Second World War" pp. 458-466 in *The Conduct of the Air War in the Second World War* edited by Horst Boog (Oxford: Berg Publishers, 1992) p. 460; and Richard Hallion, *Strike from the Sky: The History of Battlefield Air Attack, 1911-1945* (Washington D.C.: Smithsonian Institution Press, 1989) pp. 172-74.
3. More recent scholarship makes it clear that the reorganization of the tactical air forces was not due to Kasserine, and that in fact the reorganization had been decided upon before that battle. The point here is that classically the reorganization was ascribed to the defeat at Kasserine.
4. Coningham's nickname was "Mary," a corruption of "Maori", an allusion to his New Zealand roots. See Vincent Orange, *Coningham: A Biography of Air Marshal Sir Arthur Coningham* (London: Methuen, 1990), reprinted by the [US] Center for Air Force History, 1992.
5. Field Manual 100-20 *Command and Employment of Airpower*, originally published 21 July 1943 by U.S. Government Printing Office, Washington D.C. A photo-reproduction of the entire original publication, cover to cover, is available in *Air power and Ground Armies: Essays on the Evolution of Anglo-American Air Doctrine 1940-1943* edited by Daniel R. Mortensen (Maxwell AFB Ala.: Air University Press, 1998), pp. 167-82.
6. Most notably the A-8-A-12, A-17 and then the A-20. The success of the attack aviation types of that era in their design role is another issue.
7. Garner Johnson, "Forgotten Progress: The Development of Close Air Support Doctrine Before World War II" *Air Power History* (Spring 1999, pp. 45-65) pp. 52-53.
8. David R. Mets "A Glider in the Propwash of the RAF?" in *Airpower and Ground Armies: Essays on the Evolution of Anglo-American Air Doctrine 1940-1943* edited by Daniel R. Mortensen (Maxwell AFB, Ala.: Air University Press, 1998, pp. 45-91).
9. *Ibid*, p. 75.
10. Vincent Orange, "Getting Together", pp. 1-44 in Mortensen, *Airpower and Ground Armies*, p. 38.
11. See for instance John Slessor's account in *Air power and Armies* (London: Oxford University Press, 1936).
12. H. Montgomery Hyde, *British Air Policy Between the Wars 1918-1939* (London: Heinemann, 1976), p. 490. See also Powers, *Strategy Without Slide-Rule*, p. 158.
13. Brian Bond, *British Military Policy Between the Two World Wars* (Oxford: Oxford University Press, 1980) p. 22; Max Hastings, *Bomber Command* (London: Michael Joseph, 1979) p. 40; Higham, *The Military Intellectuals in Britain*, pp. 175, 196; R.J. Overy, *The Air War, 1939-1945* (New York: Stein and Day, 1981) pp. 12-13; Malcom Smith *British Air Strategy Between the Wars* (Oxford, 1984) pp. 50, 55-56, 74, 304.
14. *Ibid* p. 167.
15. Montgomery Hyde, *British Air Policy Between the Wars*, p. 323.
16. COS(41)83(0) "The Air Program" 21 May 1941, PRO CAB 80-58, quoted in W.A. Jacobs "Air Support for the British Army, 1939-1943" *Military Affairs* (Volume XLVI, No. 4, December 1982, pp. 174-82) p. 175.
17. An official account of this is given in the originally classified report by the Air History Branch, *Air Support, The Second World War 1939-1945: Royal Air Force* (Air Ministry: Air Publication 3235, 1955) (hereafter cited as AHB, *Air Support*). See also Shelford Bidwell and Dominick Graham, *Fire-Power: British Army Weapons and Theories of War 1904-1945* (London: George Allen and Unwin, 1982), pp. 264-65.; and Richard Townsend Bickers *Air War Normandy* (London: Leo Cooper, 1994) pp. 150-67.
18. A copy of the Wann-Woodall Report is reprinted in full in the War Office narrative "Army Air Support", (PRO WO 277-34 Appendix C, 1945). See also "Close Support by Bomber and Fighter Aircraft" (PRO AIR 39-140, 1940-41); and Ian Gooderson, *Air Power at the Battlefront: Allied Close Air Support in Europe 1943-1945* (London: Frank Cass, 1998), pp. 24-25.
19. AHB, *Air Support*, pp. 26-28.
20. Lord Tedder, *With Prejudice* (London: Cassell, 1966), pp. 124, 127-28, 138-43; and Sir Maurice Dean, *The Royal Air Force and Two World Wars* (London: Cassell, 1971), p.212.
21. The directive is reproduced in full as an appendix to AHB *Air Support*, pp. 209-20. Archival copies of the original can be found in PRO AIR 41-25.
22. At this point, the ASC, like the originally envisioned Close Support Bomber Control, was located at the corps headquarters level. AHB, *Air Support*, p. 28. Eventually, this control function would come to rest at the army headquarters level.
23. Bidwell and Graham *Fire-Power*, p. 265.
24. Charles E. Carrington, *Soldier at Bomber Command* (London: Leo Cooper, 1987), p. xiii.
25. For instance, the, eminent British historian John Terraine, in his forward to Carrington's *Soldier at Bomber Command*, notes his disagreement with Carrington on this point, p. ix. Terraine's own *The Right of the Line: The Royal Air Force in the European War, 1939-1945* (London: Hodder and Stoughton, 1985), pp. 351-52 gives his own interpretation of the matter.
26. Richard Townsend Bickers, *Air War Normandy* p. 150-153; Peter C. Smith *Close Air Support: An Illustrated History 1914 to the Present* (New York: Orion Books, 1990) pp. 97-98.
27. Gooderson, *Air Power at the Battlefront*, p. 87.
28. AHB, *Air Support*, p. 149.
29. British War Office, *Air Support and Air Reconnaissance, Aspects of Combined Operations in North West Europe, June 1944-May 1945*, an immediate post war report prepared by the British Army, found in PRO AIR 37-881, (hereafter cited as WO, *Air Support and Air Recce*), Appendix H to Chapter 3, paragraph 5.
30. It has to be said that the British were much better at coining terminology than the acronym-loving Americans.
31. British War Office, *Army-Air Operations: Pamphlet No. 1-General Principles and Organization*, (26-GS Publications-1127), 1944 and *Army-Air Operations: Pamphlet No. 2-Direct Support* (26-GS Publications-1181), 1944.
32. Most of the actual writing and editorial work on the two publications was done not by the RAF but by an Army officer, Lt. Col. Charles E. Carrington. He worked with both Army Cooperation Command and then as the Army Liaison Officer to Bomber Command, and became one of the behind the scenes facilitators of tactical air power. His memoirs, *Soldier at Bomber Command*, offer an illuminating look behind the scenes of the development of air support doctrine in Britain. He was also an interesting figure in his own right, an Oxford graduate and a Cambridge don, probably best known as the author of the two Great War works *Soldier From the Wars Returning*, *A Subaltern's War* and a fine biography of Kipling.
33. Hq No. 84 Group, memo "Organization of Staffs and Operations Rooms at R.A.F. Composite Group and Army Headquarters" no date, probably late 1944, copy in PRO AIR 2-7870.
34. The wording is that of Air Vice Marshal W.F. Dickson, "Address to Headquarters 1st Canadian Army"

June 7, 1943, National Archives of Canada, Record Group 24, Volume 10671, file 215C1.093.

35. WO, *Army-Air Operations: (1) General Principles and Organization*, p. 8.

36. "Direct Support" included not just close support, but also that air power applied behind the enemy's lines but still within the general battle area. This makes the 1944 British conception of "direct support" equivalent in modern terms to a combination of Close Air Support (CAS) and Air Interdiction (AI) targets to a depth of approximately the enemy army-group rear areas (what until recently NATO doctrine called "Battlefield Air Interdiction" or "BAI").

37. WO, *Army-Air Operations: (2) Direct Support*, p. 12.

38. For an account of some of these unsung efforts, see J. Davies and J.P. Kellet, *A History of the RAF Servicing Commandos* (Shrewsbury: Airlife Publishing, 1989). Christopher Shores, *Second Tactical Air Force* (Reading: Osprey Publications, 1970) also gives a brief overview of the myriad ground support that it took to put 2d TAF in the air.

39. 1st Canadian Army Headquarters, memo "Organization and Employment of 1 Canadian ASSU" 8 March 1944, National Archives of Canada, Record Group 24, Volume 10671, file 215C1.093(D2).

40. WO, *Air Support and Air Recce*, Chapter 4, p. 4, paragraph 5.

41. *Ibid*; also WO, *Army-Air Operations (1) General Principles and Organization*, p. 22.

42. Or, alternatively, they could coordinate their separate staffs by constant telephone, meetings and mutual visits—both methods were tried. The memo "Organization of Staffs and Operations Rooms at R.A.F. Composite Group and Army Headquarters" (PRO AIR 2-7870) thoughtfully compares these two methods, and comes to the sensible conclusion that separate operations rooms are best when the Air Force must fight its own campaign for air superiority, but that a single joint operations room is best in conditions of friendly air superiority.

43. WO, *Army-Air Operations (2) Direct Support*, p. 1.

44. To avoid possible confusion, it should perhaps be noted that in modern U.S. terminology an "ALO" is an Air Force officer detached to the Army, whereas an Army officer working with the Air Force is a Ground Liaison Officer or "GLO." In Second World War British parlance, ALOs were Army officers working with air support. They were generally junior officers from the combat arms who had been given a short course in air support doctrine and procedures.

45. Although meant to be held daily, in practice it usually met only approximately every other day. WO, *Air Support and Air Recce*, Chapter 3, paragraph 12.

46. *Ibid*, Chapter 3, paragraphs 12-14.

47. *Ibid*, Chapter 3, paragraph 14. This Army report somewhat sardonically notes that "RAF representatives with the necessary powers of decision were not always forthcoming."

48. *Ibid*, Chapter 3, paragraph 16.

49. WO, *Army-Air Operations (2) Direct Support*, p. 2.

50. WO, *Air Support and Air Recce*, Appendix H to Chapter 3, paragraph 3.

51. *Ibid*.

52. Memo, "Report on Visit to 84 Group on the 28th July, 1944", (PRO AIR 2-7870), quotes one hour. Of this, about 15 minutes were taken by flying time. Headquarters, British 51st (Highland) Division, memo "British and American Methods of Air Support", 7 March 1945, (PRO WO 205-546), which reflected actual experience, suggests it was often two or three hours.

53. WO, *Air Support and Air Recce*, Chapter 3 p. 10. See also Gooderson *Air power at the Battlefront*, pp. 199-201 for an examination of the tactic of armed recce.

54. For instance, an RAF "Operational Research" study

undertaken in July 1944, "confirms the overall effectiveness of widespread armed recce in confusing and delaying the enemy's supplies, at the same time inflicting serious losses when targets have actually been located and attacked." ("RP and F-B effectiveness 22 Jun-7 Jul" noted in 8 July entry of 84 Group *Operations Record Book*.) In fact, armed recce has been singled out, at the time and ever since, as 2d TAF's single most effective form of air attack. Ian Gooderson devotes a chapter of his book to a detailed analysis of armed recce's effectiveness, coming to the conclusion that armed recce was of far greater value to the Allied war effort than close support (Gooderson, *Air power at the Battlefront*, Chapter 8). See also Richard P. Hallion "Battlefield Air Support A Retrospective Assessment" *Air power Journal* Spring 1990 p. 11; or his book *Strike from the Sky* (Washington: Smithsonian Institution Press, 1989) and John Terraine, *The Right of the Line: The Royal Air Force in the European War, 1939-1945* (London: Hodder and Stoughton, 1985), pp. 658-662. As regards mission apportionment, the records extant in the archives do not facilitate a definitive answer, but the author estimates that about 40 percent of 2d TAF's fighter-bomber sorties were consumed by defensive fighter missions, 35 percent by armed recce, 15 percent by pre-arranged missions, and 10 percent by impromptu close support. Discounting the defensive fighter sorties in order to focus purely on the effort allocated to the various types of ground attack missions, the figures become roughly 60 percent armed recce, 25 percent pre-arranged, and 15 percent impromptu. (Conclusions from the authors unpublished MA thesis *2d TAF and the Normandy Campaign: Controversy and Under-Developed Doctrine*, Royal Military College of Canada: Kingston, Ontario, 1999).

55. John F. Shiner, *Foulois and the U.S. Army Air Corps 1931-1935* (Washington, D.C.: Office of Air Force History, 1983) p. 11.

56. Maurer Maurer (ed.) *The U.S. Air Service in World War I, Vol II: Early Concepts of Military Aviation* (Washington, D.C.: Office of Air Force History, 1978) p. 267. William Sherman published his thinking in a book *Air Warfare* (New York: The Ronald Press Co., 1926), recently reprinted (Maxwell AFB Ala.: Air University Press, 2002).

57. *Ibid*, p. 51.

58. Gary Robert Lester, *Mosquitoes to Wolves: The Evolution of the Airborne Forward Air Controller* (Maxwell AFB Ala.: Air University Press, 1997) p. 8.

59. Field Manual 1-5 *Employment of the Aviation of the Army*, (US Army Air Corps, 15 April 1940). For descriptions of it see W.A. Jacobs, "Tactical Air Doctrine and AAF Close Air Support in the European Theater, 1944-1945" pp. 35-49 *Aerospace Historian* (Vol. 21 No. 1, Spring 1980), p. 38; Greer, *The Development of Doctrine in the Army Air Arm*, pp. 112-15; and in particular Daniel Mortensen *A Pattern for Joint Operations: World War II Close Air Support, North Africa* (Washington D.C.: Office of Air Force History, 1987) pp. 6-7.

60. Lester, *Mosquitoes to Wolves*, p. 8-9.

61. U.S. Army Hq, "Notation on Brief of Meeting", April 17, 1941, Reel 32, item 1344, George C. Marshall papers, George C. Marshall Research Library, Lexington, Virginia.

62. For an account of this, see Carl A. Spaatz, "Leaves from My Battle of Britain Diary," *Air Power Historian* (Spring, 1957, pp. 66-75).

63. See note 60 above.

64. Field Manual 31-35 *Aviation in Support of Ground Forces*, originally published 9 April 1942 by U.S. Government Printing Office, Washington D.C., Archival copy available in file K170.13-31-35, Bolling Air Force Base.

65. See notes 20-22 above.

66. FM 100-20 did not supersede, FM 31-35 as is some-

times mistakenly thought. The preamble to FM 100-20 states that it replaces FM 1-5 (FM 100-20, p. 1). FM 31-35 is later explicitly cited as an amplifying reference that remained valid (FM 100-20, p. 3).

67. The chapter break down of FM 31-35 is as follows:
Chapter 1, General, 2 pages;
Chapter 2, Combat Aviation (meaning all forms of ground attack by tactical air power), 5 pages (and this includes a section on intelligence);
Chapter 3, Observation Aviation and Photography, 13 pages;
Chapter 4, Air Transport, 10 pages; and
Chapter 5, Signal Communication, 21 pages.
68. See note 37 above, and Table 1 in the text.
69. FM 31-35, pp. 10-11.
70. *Ibid*, p. 11, final sentence of paragraph 31.
71. FM 100-20, pp. 10-11.
72. FM 31-35, p. 1.
73. FM 31-35, pp. 12-13.. This of course reflected the original British practice, still current at the time of FM 31-35's writing, of placing CSBCs-ASCs at corps level. As explained in note 22 above, this function eventually came to rest at army level.
74. *Ibid*, pp. 48-49. Note that U.S. "regimental" level corresponds roughly to the British "brigade" level.
75. *Ibid*, p. 2.
76. Headquarters, Mediterranean Allied Air Forces, "Close Support of the Fifth Army" Tab D, (available from Maxwell AFB: Air University, 1945); Terraine, *The Right of the Line*, pp. 595-96.
77. This name change was apparently driven by USAAF concern that the word "support" in the name appeared to make it too subservient to the ground forces. See Jacobs, "Tactical Air Doctrine and AAF Close Air Support in the European Theater, 1944-1945", note 31.
78. Air Support Controls should not be confused with Air Support Commands. ASC stood for Air Support Control.
79. W.A. Jacobs "The Battle for France, 1944" in *Case Studies in the Development of Close Air Support* edited by B.F. Cooling, (Washington D.C.: Office of Air Force History, 1990 pp. 237-293), p. 238.
80. Later the term "Tactical Control Parties" or "TCPs" was also used.
81. Each fighter-bomber group had two such GLOs, Colonel E.L. Johnson, "Information Regarding Air-Ground Joint Operations" Headquarters First U.S. Army, G-3 Air Section, memo dated 16 July 1944 (copy on file at the archives USAF Aerospace Studies Institute declassified EO 11652), p. 36.
82. Hq, IX Tactical Air Command, "Standard Operating Procedure for Air Support Parties", memo number 20-2, 3 August 1944, (copy on file at the archives USAF Aerospace Studies Institute, declassified EO 11652). Note that these were simply SOPs, not formal doctrine.
83. Lt Col W.S. McCrea, Headquarters European Theater of Operations, U.S. Army, Immediate Report No. 1 (Combat Observations), "Close Air Support Within 12th Army Group" original file no. 370.2 (G-3), 20 Nov 44, p. 3.
84. Jacobs "The Battle for France", p. 260.
85. *Ibid*; see also Johnson, "Information Regarding Air-Ground Joint Operations", diagram on p. 43.
86. Jacobs, "The Battle for France", p. 260.
87. David N. Spires, *Patton's Air Force: Forging a Legendary Air-Ground Team* (Washington, D.C.: Smithsonian Institution Press, 2002) p. 59.
88. Headquarters, British 51st (Highland) Division, memo "British and American Methods of Air Support" 7 March 1945, (PRO WO 205-546).
89. Jacobs, "Tactical Air Doctrine and AAF Close Air Support in the European Theater, 1944-1945" p. 43.
90. Gooderson, *Air Power at the Battlefront*, p. 200.
91. Armored Column Cover description from Johnson,

"Information Regarding Air-Ground Joint Operations", p. 1-11 and Kenn Rust, *The Ninth Air Force in World War II* (Fallbrook, California: Aero Publishers Inc, 1970), p. 105.

92. FM 100-20, p. 10-11.

93. In fact, FM 100-20 does not use the term "phases", but rather "priorities." The term "phases" appears to have entered the USAAF lexicon via the otherwise generally forgotten publication *The Air Force in Theaters of Operations: Organization and Functions*, which was an unnumbered series of booklets. One, titled "The Air Support Command" was published in May 1943, and it included an explanation of the three-tiered priority using the term "phases." See Daniel R. Mortensen "The Legend of Laurence Kuter: Agent for Air power Doctrine" in *Airpower and Ground Armies*, (pp 93-145), pp. 118-119. By the end of the war the term was clearly widespread, the very title of the Ninth Air Force official after-action report on close air support, AAF Evaluation Board Report "The Effectiveness of Third Phase Tactical Air Operations" (Dayton, Ohio: Wright Field, 1946)–"third phase" meaning the third priority which was close support.

94. See the AAF Evaluation Board Report "The Effectiveness of Third Phase Tactical Air Operations in the European Theater."

95. See for instance Mortensen, "The Legend of Laurence Kuter" p. 138.

96. General Bradley claims personal credit for the idea in an unconvincing anecdote in his autobiography: Omar Bradley *A Soldier's Story* (New York: Henry Holt and Company, 1951) p. 337. For a more recent account of the story, see Spires, *Patton's Air Force*, p. 67, which even uses the very word "folklore".

97. W.F. Craven and J.L. Cate *The Army Air Forces in World War II Volume III Europe: Argument to V-E Day, January 1944 to May 1945* (Washington: USAF Historical Division, 1948) pp. 238-39.

98. At least one report noted that, in some divisions, the ¼ ton vehicle (i.e. a jeep) was "still preferred for all ASPO's [sic] operating with armored units." Headquarters AAF Evaluation Board, "Report of Tactical Committee: Study of doctrine, organization, tactics and techniques of AAF" London, England, September 26, 1944, p. 3.

99. British Air History Branch narrative, *The Liberation of North West Europe Vol IV The Breakout and the Advance to the Lower Rhine, 12 June to 30 September 1944*, (copy in PRO AIR 41-67), p. 47. Of course, this does not mean that the British invented it first or that the U.S. must have copied it from them. But it does illustrate that the idea of mounting forward controllers in a tank was not as original as some of the storytelling would have one believe.

100. Spires, *Patton's Air Force*, p. 67.

101. McCrea, "Close Air Support within 12th Army Group", p. 3.

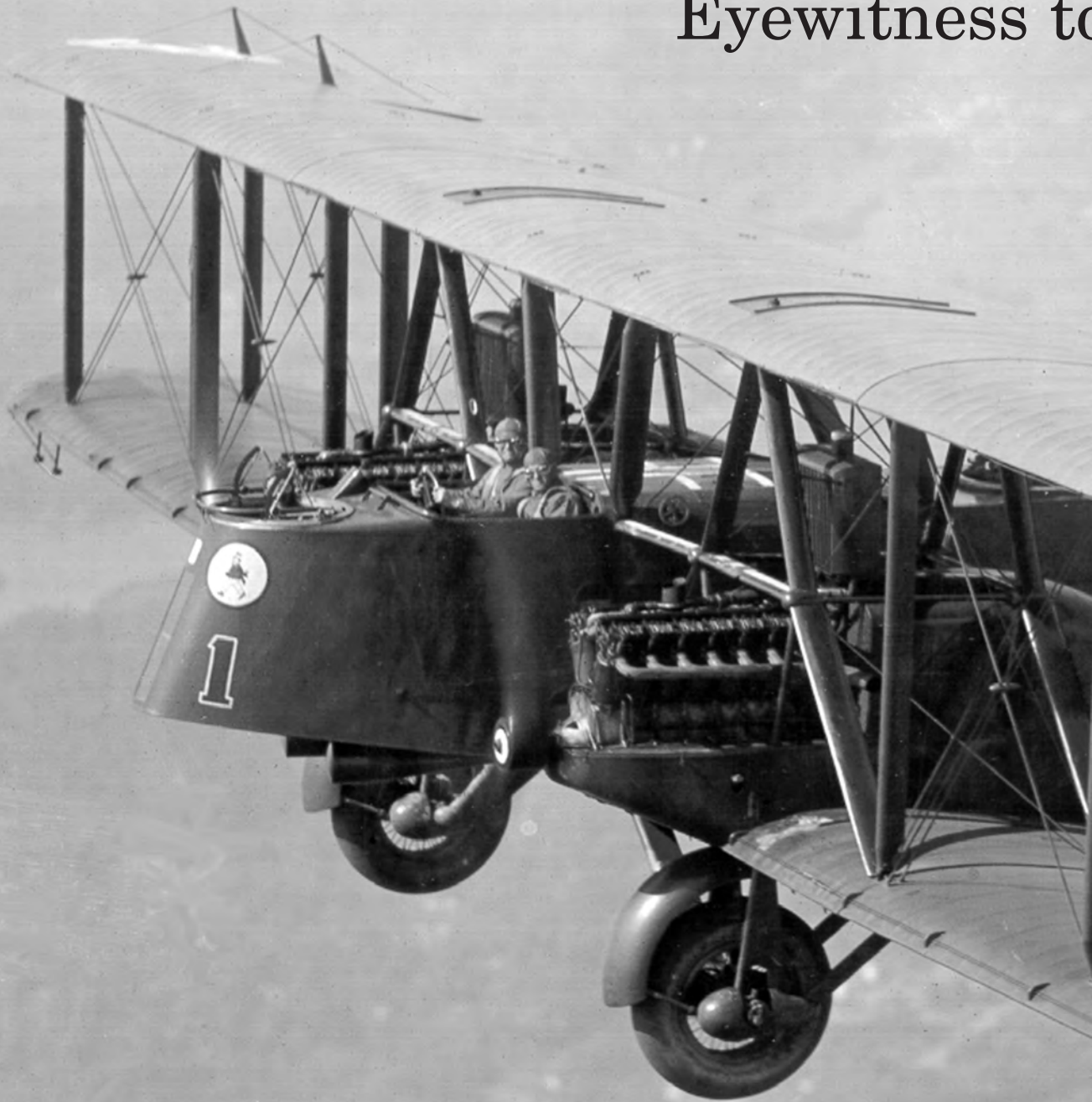
102. Those levels of command being: platoon (three or four tanks); company (three or four platoons); battalion (three or four companies plus support elements); and CC (three or four battalions plus artillery and service support).

103. Mets "A Glider in the Propwash of the RAF?", p. 52.

104. "Recce" (pronounced "rek-ee") being the British abbreviation for reconnaissance, as opposed to the American "recon". "Recce" (vice recon) is exactly the term that appears in the contemporary USAAF documents, for instance the AAF Evaluation Board Report "The Effectiveness of Third Phase Tactical Air Operations in the European Theater, 4 May 1944 to 8 May 1945".

105. For instance William W. Momyer, *Air Power in Three Wars* (Washington D.C.: Government Printing Office, 1978), or more contemporaneously, Brig. Gen. Laurence Kuter, "Air-Ground Cooperation in North Africa" *Air Force Magazine*, (July 1943), p. 5.

Eyewitness to

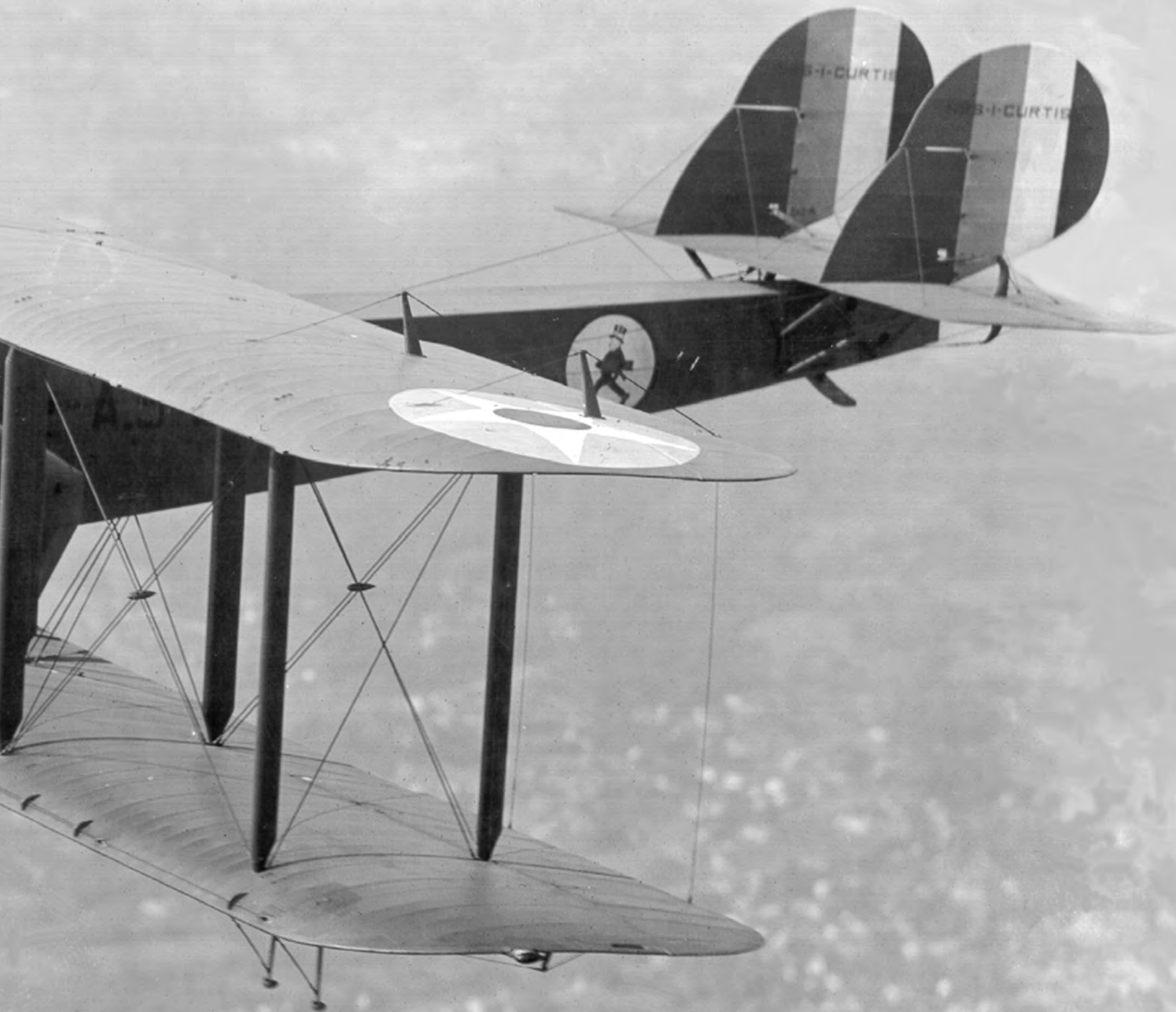


Keith Ferris is well-known as the dean of aviation artists. His article is adapted from a slide presentation prepared for the Air Force Leadership Conference. Entitled A Century of Air Power Leadership: Past Present and Future, Mr. Ferris delivered the presentation on October 30, 2003, at the George Bush School of Government and Public Service, Texas A&M University, College Station, Texas.

Keith Ferris

Life, Flight and Art

Seventy-five Years of Air Force History



©2003 Keith Ferris

As an Air Corps, Army Air Force and U. S. Air Force brat, born in Honolulu in the then Territory of Hawaii in May of 1929, I was to grow up through the 1930s and 1940s as eyewitness to the tremendous growth of air power and, you will see, because of my subsequent career, I have been able to closely observe Air Force history for seventy-five years.



My dad flew in the Air Force from September 1925 to September 1955. Think about this!

Imagine a flying career spanning aircraft from the World War I Curtiss Jenny and De Havilland DH-4, right up to the second generation of Air Force jets! My Dad's was the generation that built and led the force that won World War II and fought to create today's separate United States Air Force.

It has been a remarkable privilege to live at the center of all of this.

Let's look at some of the tremendous changes we've seen in my own lifetime.

My dad was a young lieutenant assigned to Luke Field which, prior to 1934, was located on the western side of Ford Island, opposite Battleship Row in the middle of Pearl Harbor.



Luke was Dad's first assignment following his September 1926 graduation from the Air Corps Advanced Flying School at Kelly Field, Texas.

Our quarters bordered the landing ground to the north of the hangars, so that aircraft were flown from grass only yards from our front steps.

Due to budget considerations, graduating flying cadets were given the option of being commissioned as second lieutenants in the Army Reserve and leaving the service, or staying in as rated flying cadets and continuing flying operations on private's pay plus flying pay at 50 percent of base pay.

My dad chose the rated flying cadet route and became the lowest ranking pilot at Luke until earning his Regular Army commission as a 2d lieutenant, effective January 23, 1927.



At Luke we had the large American-built single-engined 400-horse Liberty powered de Havilland DH-4M observation and close support aircraft.



Dad flew both the DHs and the single-engine Loening OA-1 amphibian (seen above). The Loening was flown in the air-sea rescue role throughout the Hawaiian Islands. Dad had many interesting adventures in this one.

We also had the twin-engine NBS-1 bomber (as seen on the opening spread of this article). It was the Curtiss-built version of the Martin MB-2 made famous only a few years earlier by Billy Mitchell, when he demonstrated the vulnerability of naval ships to air power off of Hampton Roads.



Not only were most of our airplanes of World War I vintage, but so were our vehicles, complete with their hard rubber tires as seen here in our motor pool.

With the low budgets of those days we were to see some of these vehicles well into the thirties.

**YOU COULD
LAND
AIRPLANES
JUST ABOUT
ANYWHERE
IN THOSE
DAYS**



You could land airplanes about anywhere in those days. They hauled all sorts of things in those airplanes....



Some horseshoes for a little recreation. You can see that they camped right out there amongst their airplanes.



...even set up headquarters in the field. Could the orderly be already asleep on the cot to the right?



My dad, Lt. C. I. Ferris, seen at his tent, shaving in the field with his parachute by his side.



The mess tent. Notice the boot pants, socks and all the strange combinations of clothing in the chow line.



The DH-4Ms served alongside their crews in the field.



The Officer's Club

These World War I-era DHs were remanufactured by Boeing with metal fuselage structures while still using the 400-hp Liberty engine. The last of the DHs were not retired until 1932.

When I was six months old, we moved from Honolulu to Kelly Field, Texas, to a wonderful life for six years on this grass flying field typical of the 1920s and early 1930's.



Those are Curtiss P-1s of the Pursuit Section of the Air Corps Advanced Flying School, while in the distance are Douglas O-2Hs of the Observation Section, Curtiss A-3s of the Attack Section and, at the far end, Keystone B-3s and B-5As of the Bombardment Section. Today's Lackland AFB sits atop that ridge in the background.



My dad was an instructor in the 43d School Squadron which made up the Pursuit Section of the school. All Air Corps flight training culminated in cadet introduction to combat type aircraft of one model or another at Kelly.

When we first arrived in 1929, the Pursuit Section flew the wonderful Curtiss P-1 Hawk. This was true until they were replaced by Boeing P-12Bs beginning in 1932. That flight line was a very enticing (and tightly supervised) playground for us dependent kids.



Our quarters were in the line seen to the right just opposite the pursuit section hangars with this Curtiss P-1B.

We lived in a bright, dusty, noisy world of aircraft engines, airplane dope and gasoline.



In April 1932, we began to receive the Boeing P-12, which was to gradually replace the P-1 in pursuit training. Behind the flight line, the base was only one block deep. Between the hangars you can see the cadet barracks beyond the newly arrived P-12B.



The P-12B was a wonderful aircraft, loved by all who flew her. It became one of my all time favorite aircraft and remains so today. This P-12B, seen in May 1932, flown by Curley Lawson, one of my dad's fellow instructors. The 43d Squadron insignia has yet to be completed. The bold stripe behind the cockpit appeared on P-12s flown by instructor pilots.

Living right across the street from the flight line, I was able to meet visiting aircraft as they parked in front of the "Visiting Ship" hangar, just west of the last pursuit section hangar across the street from our quarters. I would quiz the crews, learning type of aircraft and where it was based.

ONE DAY MY
DAD CAME
HOME FROM
THE FLIGHT
LINE ACROSS
THE STREET,
BLEEDING
FROM HIS
LEFT HAND
AND FACE



The young Ferris at age four, pictured with a visiting Douglas Y1B-7 belonging to the 31st BS of the 7th BG., en route to its base at March Field, Riverside, California, from the 1933 exercises held at Fort Knox, Kentucky.



Dad leads formation of instructors and students in 1933.



He debriefs the formation flight with his students.



"Farmer's Nightmare" is my 1990 painting of my dad in his P-12 #2 with two students in a farmer's field in 1932. It depicts a day remembered from my childhood at Kelly.



On this day my dad came home for lunch from the flight line across the street. He was bleeding from his left hand and face. An understanding of the Pursuit Section curriculum will be helpful here.

New students had arrived at Kelly from primary flight training at Brooks Field, having flown two seat PT-1 trainers, powered by the 180-horsepower Wright-built Hispano.

If assigned to the pursuit section, students were faced with transitioning to the single-seat Boeing P-12 fighter, powered by a 450-horsepower Pratt & Whitney Wasp engine.

The first week of the training syllabus was spent learning to take off and land this much more powerful aircraft solo on the wing of an instructor in a second P-12.

The second week of the syllabus included formation flying and strange field landing practice. This would involve three-ship flights of one instructor and two students in P-12s, fanning out in all directions from Kelly.

On this particular day, my dad, the instructor had spotted a likely area for safe emergency landing, wagged his wings and gave his students the cut signal. The students chopped the power, selected a suitable farmer's field, and landed into the wind, followed closely behind by the instructor.

Having taxied back to the approach end of the field, and out of the student's way in a corner of the fenced field, my dad began to notice daylight through the fabric at the side of the cockpit and that his hand was bleeding. Over the noise of those individually exhaust-stacked Wasp engines, he had failed to hear the sound of the angry farmer firing at him with his shot gun!

The students, being unaware of this, took their time in take-off preparations as the farmer continued to shoot at dad's trapped P-12. Dad followed the students as they climbed out of range of the farmer while above, he saw instructor George Price give the cut signal for three more P-12s to land in this farmer's field. These routine practice landings were soon halted as more and more farmers were reimbursed for damage to crops.

Air Force folks know that families are part of squadrons. Our families were part of the 43d School Squadron.

We had the same vested interest in the success and safety of the squadron then as Air Force families do today.



This is my kindergarten class. You will note the 43d School Squadron patch on our little airplane. I am the student behind the tail with the boots and sweater. The little blonde girls are my two sisters, identical twins, joining us from the nursery school

**THE LIST OF
FACULTY
AND STUDENTS IN
THE 1935-
1936 CLASS
OF THE AIR
CORPS TACTICAL
SCHOOL
READS LIKE
A WHO'S
WHO OF AIR
FORCE HISTORY**



About thirty years later I created this painting for the Air Force art collection. The Air Force thinks this is titled "Pursuit Section Instructors, Kelly Field, 1932." (Those are actually the 43d Pursuit Squadron Kindergarten Fathers!)

After six years on that flight line at Kelly, we left for Maxwell and the 1935-36 class of the Air Corps Tactical School.

The list of students and instructors was made up of a virtual Who's Who in Air Force history. I know that in our childhood we were yet to understand the importance of Maxwell, the Air Corps Tactical School, and those around us who would make that history.

The list of instructors includes names such as future Flying Tiger leader Maj. Claire Chennault, Maj. Emil Kiel and Byron "Hungry" Gates, Capt. Odas Moon and Gordon Saville, Lts. Laurence Kuter, and Haywood "Possum" Hansell.

Among the seventy students were Maj. Ira Eaker, William Kepner, Edgar Sorenson, Capt. K. B. Wolfe, Harry Halverson, Nathan Twining, Homer Ferguson, Dale Gaffney, K.B. Wolfe, Benjamin Chidlaw and Ralph Snavely. Lts. Elwood "Pete" Quesada and my father Carlisle I. Ferris were also ACTS students.

The Ferris children grew up in the middle of the controversy over future Air Corps doctrine. Advocates of strategic bombardment were arrayed against those supporting the traditional pursuit, attack and observation missions. We kids listened to this historic discussion almost every night as parents and friends reviewed the day's subject matter.

In June 1936, the ACTS class moved almost en masse from Montgomery to the United States Army Command & General Staff School (C&GSS) located at Fort Leavenworth, Kansas.

The Eakers, Georges, Sorensons, Kepners, Fergusons, Halversons, Kiels and Quesadas were with us. We also had Col. Lewis Brereton and family, Maj. Joe Cannon and Maj. Dale Gaffney. Our next door neighbors in the "Beehive," the student family apartment building, were future Air Force Chief of Staff, and Chairman of the Joint Chiefs, Capt. Nathan Twining and his wife, Maud.

My dad and Pete Quesada were now captains. These two shared back-to-back regular army serial numbers 0-16730 and 0-16731. Announcement of their subsequent assignments appeared next to

one another in the Army-Navy Journal until the advent of the United States Air Force.

Field exercises at C&GSS included reconnaissance on horseback. To the Air Corps contingent, accustomed to aerial observation, this seemed archaic.

Airmen did not take well to horseback riding, nor the time and discomfort this involved.

The obsolescence of cavalry reconnaissance was all the more evident as the airmen maintained their flight proficiency, using aircraft flown off of the grass airfield just beyond the Cavalry horse barns.

The Air Corps officers, in the class of 1937, revolted against wearing the required Cavalry-era boots and boot pants uniform, ordering straight legged trousers of proper material from local tailors to replace lower part of the uniform.

On graduation from C&GSS in June 1937, the Ferris's moved on to March Field, California, where dad was assigned as operations officer and deputy commander of the 30th Bombardment Squadron, 19th Bomb Group and later, post adjutant.



The 19th Bomb Group was equipped with the Douglas B-18 which was a player in the politics of the ongoing strategic bombing controversy.

The twin-engine B-18 was less expensive than its four-engine B-17 competitor and, with its shorter range, was considered less threatening to the Navy in the argument over Army-Navy roles and missions.

We did have the Norden bombsight, which was evident to us kids by the conspicuous inclusion of armed guards when it was being moved to and from the aircraft.

My first flight ever was on my tenth birthday at March Field in the newer B-18A.

Memory tells me that at this time the entire Army Air Corps consisted of little more than 1,600 officers and 16,000 enlisted men.

The war came and Air Corps officers of the 1920s and 1930s moved on to build and lead the massive aerial force which was to overwhelm our World War II enemies.

Many of these experienced leaders were to be engaged in building the huge flying and technical training effort which provided the trained manpower for that force.

In 1942, my dad built and commanded the BT-13 equipped basic flying school at Coffeyville, Kansas, before moving on in 1943 to Fort Worth, Texas, where he commanded Tarrant Field, later known as Carswell AFB. Tarrant was a B-24 transition school with seventy B-24s assigned.



IN THOSE DAYS IT WAS THE COMMANDER'S WIFE AND THE CHAPLAIN WHO BROKE THE NEWS TO THE SURVIVORS OF THE DECEASED

The commander's family, my mom, myself, two sisters and our younger brother, were the only dependents on the base, so those B-24s, personnel and daily operations became the center of our lives for that year.

During our year at Fort Worth, I believe we lost eleven B-24s in training accidents. We were personally very much affected by these accidents, especially the three or four that occurred right on the base. I remember my dad's shoes being perpetually stained by oil and aviation fuel.

Most accidents involved the loss of two student officers, an instructor and a flight engineer, many of them had spouses or family living in the local area.



In those days it was the commander's wife and the Chaplain who broke the news to the local survivors.

This took a terrible toll on my mother, the commander's wife, Virginia Brecht Ferris whose hair began to turn to gray at thirty-eight years of age.

I doubt that the general public realizes or appreciates the integral and very important part played by military wives in support of military units and in the defense of our country.

Many interesting and distinguished visitors passed through Fort Worth in those days. Navy Admiral "Bull" Halsey, of World War II fame, made a refueling stop at Tarrant Field on his way from the Pacific to Washington. The admiral and a

marine general arrived on short notice and were greeted by my dad, seen on the right in the photo above right. The admiral announced that he was very interested in B-24 combat crew training that many of the pilots who had conducted the recent

attack on the oil refineries at Ploesti, Rumania, had received right here at Fort Worth.



Admiral Halsey was most impressed as dad was able to introduce Ploesti veteran instructor pilots who provided first hand information on B-24 combat operations.



The three Ploesti veteran instructors did a superb job of demonstrating B-24 low level tactics, while at Fort Worth.

Afterwards, the admiral responded to his visit with a very complimentary handwritten thank you note. About a month later, dad received orders to the Army-Navy Staff College, followed by assignment to the Pacific where he served on Admiral Nimitz's staff as an air force planning officer in Honolulu and then forward as Admiral Nimitz's headquarters moved to Guam for the remainder of the war.

A lot of people ask why, growing up in the middle of all of this, did I not pursue a career in the United States Air Force. I had never considered anything else.

I entered Texas A&M in 1946 with the goal of earning an Air Force commission on graduation, after which I hoped to go to pilot training.

Assigned first to B Troop Cavalry, I moved over to the first of the Air Force ROTC units as it was established at the beginning of the second semester at the beginning of 1947.

Between my freshman and sophomore years in 1947, my home was Randolph Field, in San Antonio, where my dad was assigned as Deputy

**I HAD BEEN
DRAWING
AIRPLANES
SINCE I WAS
FIVE YEARS
OLD**

Chief of Staff for Personnel for Flying Division, Air Training Command. This was a very tough time to be in the personnel business. It proved difficult to keep required slots filled at a time when personnel could depart the service almost at will.



Randolph's Taj Mahal seen in all its glory in 1947.

For a summer job, I became a civil service apprentice artist with the Air Force Training Publications unit, at Randolph.

I had been drawing airplanes since I was five years old at Kelly. I had found it was easier to draw those visiting airplanes than to verbally report their details to my dad, who had been in the air during their visits.

This summer job was to prove a valuable opportunity for me. I was able to begin learning graphic arts, creating line drawings and diagrams for publication, even silk screening the basic flying manual cover by hand.



My drawing board was located in the art department upstairs in one of those two story World War II barracks right on the flight line at the south end of Randolph's East Stage

When the United States Air Force became a separate service in 1947, an open house was planned for Friday, August 1st to celebrate "Air Force Day."

As A-26s, B-25s, P-51s, P-47s, and B-29s began to arrive, we didn't pay much attention, since we were so used to these. But as I was sitting there at my drawing table, suddenly the barracks shook with a "whump-whump," followed by a sound we had not heard before. I ran out on the little balcony and arcing up into the sky were two magnificent gray fighters carrying fuel tanks mounted at their wingtips. After landing, they taxied those airplanes in and parked them right out in front of our barracks.



I nearly jumped out of my skin! Those brand new mouse gray Lockheed P-80s were absolutely beautiful. By comparison with the piston-engined fighters we were used to, these appeared to fly, climb and maneuver without effort.

Asking myself if I really wanted to wait three more years to fly airplanes, I immediately visited the School of Aviation Medicine and a flight surgeon who had served with the Ferris's for years. I wanted to know if I would physically qualify for flight training as an aviation cadet.

The flight surgeon reminded me that I had an extreme allergy to egg protein and tetanus antitoxin and that this would prevent me from receiving many of the shots required by the military. He informed me that that I would never be able to serve in the Air Force! I had suddenly been "drafted" into life as a civilian!

I finished that summer with the publications unit, returning to A&M for another semester of aeronautical engineering while continuing to dream of flight. Using brush, lampblack and water I found I could live my dreams through art.



Continuing to dream of flying jets, I returned to Randolph's Training Publications unit to remain close to the Air Force. I subsequently moved on for some art schooling.

I was later to serve for five years with a St. Louis art studio, which competed for Air Force Publications contracts. When it was found that I was the only person in the studio who understood and could speak the Air Force "language," I was put in charge of the studio's Air Force contracts and acted as studio liaison with the Air Force. I was the art director selecting artists, and relaying instructions and details to the artists. I was also the technical advisor responsible for the accuracy and artistic integrity of all art created by the studio for the Air Force.



Typical work was this Instrument Flying Manual.

PEGGY AND I DECIDED THAT IF WE WERE TO USE MY AVIATION BACKGROUND TO THE FULLEST, WE WERE GOING TO HAVE TO LEAVE HER LIFELONG HOME TOWN, ST. LOUIS

I was “home” again, working with and for the Air Force.

In addition to my Air Force contract duties, I was production manager of the studio, handling such solid accounts as Brown Shoe Company, Anheuser Busch, Monsanto Chemical, and Ralston Purina.

Of course I still wanted to fly. So, soon after our 1953 marriage, my wife Peggy and I were both taking flying lessons at a club flying “tail draggers”; a Piper J-3 Cub, a Luscombe 8E Silvair, and a Cessna 140.



The painting depicts my first solo in the J-3. I had amassed the grand total of 11.5 hours with two solo flights, when the Air Force decided to close its central publications unit in St. Louis to let the various commands create their own training publications. The studio's Air Force contracts were gone and without them my ties to the service had vanished once again.

Even though I was still gainfully employed as the studio production manager, Peggy and I decided that, if I were going to be able to use my aviation background and knowledge to its fullest, we were going to have to leave St. Louis.

A study of the aerospace industry indicated that its manufacturing facilities were located mostly on the west coast, some were in the east, and we knew that there was one right there in St. Louis.

However, I had no intention of becoming an internal corporate artist working with a single company's products.

I preferred to work for them all on a freelance basis.

We noted the number of aerospace industry headquarters concentrated in and around Rockefeller Center in New York, and also noted the fact that their advertising agencies were located close by on Madison Avenue.

The decision to drop everything and start over in a new city was a difficult and frightening one, especially for Peggy whose only home had been in St. Louis. But it was obvious that the move was necessary for our success.

So we sold our little house, put our furniture in storage and, with a one-year-old baby, no job and only one acquaintance in the New York area to call upon for advice, we started our drive east to find our future.

We had to locate a place to live, retrieve our furniture, and begin to put bread on the table. I began calling on advertising agencies with aerospace accounts, and soon received freelance assignments from Curtiss Wright, Sperry, and Aircraft Radio Corporation.



This *Aviation Week* montage is typical of Ferris line drawings of the period. These were special issue space sales ads and sales pieces used by the magazines space salesmen.



These are typical Ferris two-color advertising illustrations of the period. They were created using both blue and black for Sperry Phoenix advertising.



This is a Paris Air Show space sales ad for *Aviation Week* which was an early client and remains so to this day.

Although almost all assignments were aviation oriented, every so often I found myself required to depict things far from aviation to help art directors working next to my aerospace account art directors.

About this time I received a phone call from someone at the Society of Illustrators in New York informing me that I had been nominated to become a member of this famous art organization. The Society of Illustrators is the premier, professional organization for illustrators, now over 100 years old.

Members have included such great artists as Charles Dana Gibson, of "Gibson Girl" fame, James Montgomery Flagg, creator of the World War I Uncle Sam "I Want You!" poster, and Norman Rockwell, who was still living and a member when I joined this august group in May 1960.

I was unaware at the time, but coinciding with my becoming an SI member, the May 1960 issue of *National Geographic* magazine featured an article by General Curtis LeMay, then Vice Chief of Staff of the Air Force, entitled: "Artists Roam the World of the U. S. Air Force." The article featured the artistic results of a program that began over fifty years ago, under which the Air Force has teamed with the Society of Illustrators in New York. Professional illustrators were invited to travel and fly with the Air Force in order to document the service's mission world-wide, through art.

The most famous names in American illustration were to be found traveling with the Air Force to all parts of the world, donating time and paintings to the Air Force Art Collection, which today has grown to over, 8,500 works of art. This collection contains spectacular art depicting all aspects and periods of Air Force life as viewed by professional artists.

Over the years, the program has expanded to include members of the Societies of Illustrators of Los Angeles and San Francisco, and later the Midwest,

Southwest, and Northwest Air Force Artist groups. Artists selected by the chairmen of the Air Force Art societies, travel as guests of the Secretary of the Air Force. They are paid only per diem and travel expenses. The artist's income usually stops when the artist leaves the drawing board. The artist then donates the time for travel and the creation of the art, as well as the original art itself to the Air Force, along with specific reproduction rights for government purposes only.

One could easily wonder why an artist would do this? I had no idea this program existed when, out of the blue, in May 1961, I received a phone call from the renowned aerospace artist Bob McCall, then Air Force Art chairman of the Society of Illustrators. He asked if I would participate in a 7.5 hour B-52 training mission from Westover Air Force Base, Massachusetts.

You can imagine my reaction and immediate response!

I flew that mission, followed by a four-hour KC-135 ride refueling B-52s and was absolutely thrilled! Most important, of course, was that I was "home" once more!

I had been around orders all my life. As I studied those orders, I recognized that orders like these were going to allow me to fly after all!



In May 1963, I was invited to visit Randolph AFB to cover the T-38 Instructor Pilot School as an artist. The Instructor Pilot, Capt. John Lynch, greeted me by handing me the T-38 Dash-1 Flight Handbook. My reaction was: "Wait a minute, you're flying this airplane!" "No," he replied, "How many hours have you got?"



When I admitted to eleven and a half hours of tail dragger light plane time, He said, "You're fully qualified!"

So we discussed the upcoming mission in earnest, he checked me out in the airplane and I found myself fly-

I RECEIVED A PHONE CALL FROM SOMEONE AT THE SOCIETY OF ILLUSTRATORS ... I HAD BEEN NOMINATED TO BECOME A MEMBER OF THIS FAMOUS ART ORGANIZATION

ing the first ride in the T-38 Instructor Pilot School syllabus! John made the formation take off so I could take pictures during the first portion of the flight.



Note how early in the T-38's career this was. The aircraft on Randolph's East Stage beyond are all still T-33s.

I was to fly the airplane for the rest of the flight.

Activities included talking me through the shutting down of one engine in flight, cycling the gear, and restarting the engine. I practiced supersonic climb and investigated control in slow speed and high-G flight. John was a terrific instructor for I was able perform all he asked. I positioned our T-38 for the break and, on my first ride, made three touch-and-go landings and the full stop landing.

As I taxied that T-38 back to our parking spot, I could not help but remember those old barracks at the south end of the flightline, the arrival of those beautiful mouse gray P-80s for that 1947 Air Force Day.

As we unzipped our G-suits, I asked John for a copy of the IP School syllabus, for I was scheduled to have a look at Undergraduate Pilot Training operations the following week at Webb AFB in Midland, Texas.

Preparing for my Webb T-38 flight, I asked the T-38 instructor pilot, Capt. Jerry Welch, to keep his G-suit on because I would like to fly the number two Randolph IP School syllabus ride, the aerobatic ride! This was greeted with a huge grin. We found a G-suit and I did well on the aerobatic flight. I have not been the same since!

I also had an opportunity to fly the T-37 at Webb. I was particularly impressed with its spin characteristics! I decided that it was important to capture in a painting that most important moment in the life of the student.



The T-37 is featured in "Solo Student over the Numbers".



T-38 training was impressive and Webb T-38s are featured in my Air Force Art painting "Texas Talons Turning Final."



In November 1963, I found myself airborne in an F-100F on another Air Force Art assignment. I was in the back seat of Thunderbird 8 with Lt. Col. Bill Alden, the Thunderbird commander. Having met the Thunderbirds at Craig AFB, Selma, Alabama, I was returning at the end of a show tour with the team to their home base at Nellis AFB.

I spent a week documenting the Thunderbirds after the cross-country flight, flying a training mission in the slot after having helped replace the J57 engine and afterburner on the F-100F over our arrival weekend.

Flying with slot pilot Maj. Paul Kauttu in the F-100F was a real thrill. I found that he nearly dragged his left wingtip on the runway as we moved across underneath to place my head right between the wingtips of two wingmen in the diamond on take-off.



I found that most of the show is flown looking right up the tailpipe of the lead as seen in my Air Force painting, "View From The Slot." Paul's vertical stabilizer was black with soot right down to the top of the fuselage.

AS I TAXIED THAT T-38 BACK TO OUR PARKING SPOT, I COULD NOT HELP BUT REMEMBER THE ARRIVAL OF THOSE BEAUTIFUL MOUSE GRAY P-80S FOR THAT 1947 AIR FORCE DAY.



The photo was taken during the changeover from Trail to Diamond formation, while returning to the practice show line on "Thunderbird" Dry Lake, their then training area north of Las Vegas.



"Thunderbird Take Off" is my two-foot by eight-foot Air Force Art painting, attempting to convey the feeling of that thundering four-ship takeoff at Nellis in 1963.

I traveled to Europe with the Thunderbirds for their 1965 tour and have remained close to the Thunderbirds ever since. It did not take long before I found myself returning to Nellis regularly for Thunderbird reunions.

I turned these reunion visits into Air Force Art assignments with the concurrence of Tactical Air Command headquarters. I would arrive at Nellis a week early with mission numbers to fly with each of the weapons schools.



By this time I had my own helmet and had painted my visor cover with each aircraft type I had flown myself and had depicted in a Ferris painting already in the Air Force Collection.

My 1967 visit to the F-4 Weapons School found me flying with FWS Instructor Pilot, Maj. Duke John-

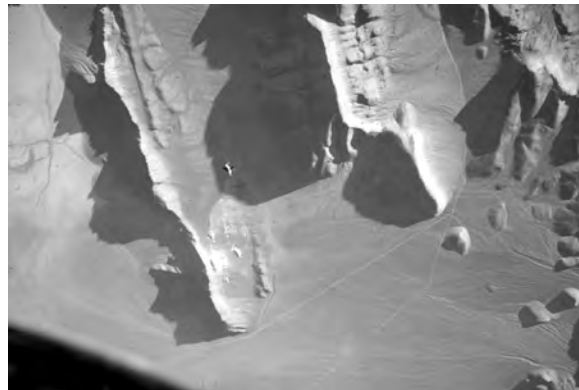
ston against his opponent and fellow instructor, Maj. Al Logan.



Duke and I are climbing out on Al Logan's wing en route to the air-to-air ranges for a bit of two-ship ACM over the high desert north of Las Vegas.



The "killer" himself, would-be fighter pilot "Walter Mitty" Ferris!



We were descending on the backside of a vertical rolling scissors. Those of you who have tried this will remember that the absolute deadline in this maneuver is the ground. The first adversary to break it off gets shot.!

WITH THE
CONCURRENCE OF
TACTICAL AIR
COMMAND
HEAD-
QUARTERS. I
WOULD
ARRIVE AT
NELLIS A
WEEK EARLY
WITH MISSION
NUMBERS TO
FLY WITH
EACH OF THE
WEAPONS
SCHOOLS

I WAS TO SPEND ABOUT EIGHT WEEKS OVER A TWENTY-FIVE YEAR PERIOD COVERING THE TACTICAL EMPLOYMENT OF FIGHTER AIRCRAFT FROM THE F-100 TO THE F-15 AND F-16



Al reluctantly played the "loser" in this canned engagement.



The experience of a lifetime! The Ferris dream come true!



And back to happy hour! Duke was embarrassed to open the formation enough for me to take this one!



I call this one "the view from the best restaurant in the world!"

I was to spend about eight weeks over a 25-year period covering the tactical employment of Nellis based aircraft including the F-100, the F-4, the F-105, the F-111, the Aggressor T-38, the F-5B, the Wild Weasel F-105 and have spent time with both the F-15 and F-16 Weapons Schools.

My flying experience over the years has proved a key element in my career. It has driven my approach to art and has been a most valuable asset in all of my work.



You can't buy this kind of flying time!



In 1967, I volunteered for and graduated from Tactical Air Command's Deep Sea Survival School conducted at Homestead AFB and Turkey Point, Florida. After a bit more F-4 time, I had filled enough squares to deploy across the Pacific. In November 1968 I deployed as a civilian back seater with the 40th Tactical Fighter Squadron, Eglin's F-4E operational test and evaluation unit. We were to replace veteran F-105s with new F-4Es in the 469th Tactical Fighter Squadron at Korat, Thailand.



For my painting "Bad News For Uncle Ho" I had decided to record the impression of just hanging out there hour after hour in the high altitude sun, drifting up and down over the vast Pacific, while other members of our cell, tankers, and F-4Es were spread out across the skyscape.

THERE ARE 40 GUYS OVER THE PACIFIC TODAY AND NOT ONE OF US HAS EVER BEEN SHOT AT. THOSE THUD DRIVERS WE ARE REPLACING IN THE 469TH TFS HAVE OVER 40,000 HOURS OVER NORTH VIETNAM.

FROM UNDER MY WING CAME THIS GENTLEMAN IN A WHITE VEST MARKED WITH A CROSS AND WORDS WHICH READ VATICAN TECH REP II

There again you see the artist in the back seat. The pilot is fellow Texas Aggie, and dear friend, Maj. Paul Lemming, who somehow drew this civilian as his GIB, ("Guy-In-Back"), for the Hickam-to-Anderson, and Anderson-to-Korat legs of the trip.

Was it coincidence they had put the two Texas Aggies in the same airplane?

As we were over the South China Sea, I asked Paul what his thoughts were at that point.

He answered: "Well, you know there are 40 guys here over the Pacific today and not one of us has ever been shot at before." And he continued: "When we land at Korat, we will be replacing the F-105's of the 469th Tac Fighter Squadron. Those Thud drivers have flown 40,000 hours over North Vietnam. I'm just wondering what kind of reception we're going to get from them when we arrive with these F-4Es."

The Korat reception was a beauty! Beginning with the parade of vehicles forming at the end of the runway (which prevented the exit onto the taxi way for all twenty F-4Es). We were subjected to a flat-bed trailer base tour lined with water buckets and fire hoses. At the Korat Officer's Open Mess, it was even wetter! First, refreshments, and then it was everyone in the pool. The 105 folks apparently had forgotten that there are two F-4 guys for every F-105 pilot. They joined us in the pool.



It took less than twenty-four hours to get the combat markings onto the airplanes and weapons loaded and the arming crews were pulling the down-lock pins and arming those M117s.



Out from under my wing came this gentleman in a white vest with black cross and words which read "Vatican Tech Rep II." He was a chaplain, Capt. Gene Gasparovic of Paterson, New Jersey. I was told that Korat never launched a strike without one of the chaplains in the arming area. Father Gasparovic was later to serve as the Air Force's chief Catholic chaplain recruiter.



They look a bit more lethal when armed up and going to war.



I also flew with the Wild Weasels of the 44th Tactical Fighter squadron at Korat. Getting to know and flying with these folks was a rewarding experience all of its own!



Wild Weasels John Revak and Stan Goldstein return from their 100th mission over North Vietnam.

These new friends were on their way home to the States where we have remained in touch ever since.

I was to fly with Capt. George Connolly on the last day of my stay at Korat.



The happy artist after F-105 mission, exclaiming "Sierra Hotel Korat!"



My Wild Weasel painting is entitled "Big Brass Ones" and depicts pilot, Maj. John Revak and electronic warfare officer Maj. Stan Goldstein, in their F-105F "Crown Seven." The painting honors John and Stan for their 100 missions over North Vietnam, the Wild Weasel mission, and the service of the F-105F and G Wild Weasel aircraft. The painting is part of the Air Force Art Collection.



I CAME OUT OF SOUTH-EAST ASIA ON A B-52 BOMBING MISSION, RECOVERING ON GUAM ON NOVEMBER 27, 1968

"Linebacker in the Buff" is my Air Force Art painting honoring B-52D 55-094 in which I came out of Southeast Asia via U Tapao on a bombing mission on November 27, 1968. We dropped 108 MK 82 500-pound bombs on North Vietnam's Mu Gia Pass, recovering 7 hours and 40 minutes later on Guam for one North Vietnam combat "counter." I was privileged to spend several hours manually flying 094 from the right seat en route to Anderson.

I proceeded home from Guam on a KC-135 "Young Tiger" returning to the states in early December. I had been away from my drawing board for over a month.

My B-52D, 094, continued to fly combat through Linebacker II in December 1972 and retired in the 1980s. Today she sits proudly on display at McConnell AFB, exhibiting much body putty, revealing repaired wounds received from a surface-to-air missile over Hanoi.

In 1980, the Air Force Association published the 1980 Keith Ferris Military Aviation Calendar. One of the images was a Ferris painting of the brand new operational F-16 then flying at Hill Air Force Base.



As soon as that calendar found its way to onto the desk of Tactical Air Command commander Gen. Bill Creech, he asked his executive officer, Lt. Col. Joe Ralston, to give me a call asking when I was going to paint an F-16 painting to go with the Ferris Air Force Art F-15 painting "Air Superiority, Blue" already hanging at TAC headquarters at Langley.

I replied: "Joe, tell your boss...when I've had a chance to fly the airplane!"



So, on April 22, 1980, I was the first civilian, outside of the of General Dynamics test force, to fly in the F-16.



The F-16 proved to be quite an airplane! This was our take-off and climb out from Hill en route to our training area beyond the Great Salt Lake.

ON APRIL 22, 1980, I WAS THE FIRST CIVILIAN OUTSIDE OF THE OF GENERAL DYNAMICS TEST FORCE, TO FLY IN THE F-16



Pop-Up delivery



The target seen on roll in from pop-up.



I had survived another one! I flew with Lt. Col. Paul Rost, commander, 34th TFS at Hill AFB, Utah. He had me try my hand at supersonic flight, wing work to area, head-on intercept of our wingman and basic fighter maneuver engagement, confidence maneuvers, slow flight, aerobatics and it took me three tries to get all the way around for my nine-G turn! We participated in a low-level split pop attack on a target west of the great salt lake.

A terrific mission and I learned that flying the F-16 can be an exhausting exercise!

Thanks to the late TAC Commander, General Creech for this opportunity.

The painting resulting from that mission was delivered to General Creech after having been sidetracked for a year as it hung in the office of Secretary of the Air Force Verne Orr.



The resulting painting is "Sunrise Encounter."

Fighter pilots will recognize the F-16's lag roll to position it behind two Aggressor F-5Es down below. Weapons School graduates and Red Flag veterans will recognize the Nellis live ordnance ranges south-east of Tonopah, Nevada, as the setting for the painting.

I was to get quite a bit of F-16 time over the years, flying with fighter wings at Kunsan Air Base, Korea, Torrejon Air Base in Spain, and the F-16 Weapons School at Nellis.



At age 71, long after many Air Force friends with whom I had flown had retired, I found myself in a 4th Fighter Wing F-15E off of Cape Hatteras, North Carolina. I was involved in five six-G engagements between two F-15Es representing MiG-29s and two F-15Es defending the coast. I found I could still handle the Gs!



The resulting painting is entitled: "Nowhere to Hide," a tribute to the Strike Eagle's tremendous capabilities. As you might suspect, I've spent many

more hours in airlifters than in fighters over the years, and some of my most rewarding hours included a 1989 trip via Honolulu to Pago Pago, American Samoa, and Christ Church, New Zealand, en route to the U. S. National Science Foundation base on McMurdo Sound in Antarctica.

THE KILLER WHALE CIRCLES UNDERNEATH THE ICE AND IDENTIFYING HIS PREY ABOVE, COMES CRASHING UP THROUGH THE ICE, SNAPPING PENGUINS RIGHT OUT OF THE AIR!



As I was talking to my new friends, the penguins, the locally-based Navy helicopter pilot asked if I knew of the biggest threat the penguin faced in Antarctica. When I told him I did not, he said: "It's the Orca!" The Killer Whale circles underneath the ice and identifying his prey above, comes crashing up through the ice, snapping penguins right out of the air!

He added: "Do you know what you look like right now?"

You just can't tap dance high enough to avoid a problem like that!



The Air Force Art painting documenting that mission is entitled: "Inspection Party." The little party around the nose of our C-141 thought that we were supposed to be the "Inspection Party" but I could not resist portraying the penguins which populate McMurdo.

This is my forty-fourth year of heavy involvement in the Air Force Art program.

I have served all of those years on the Society of Illustrators Air Force Art Committee, serving for sixteen years as its chairman, selecting artists for Air Force art tours and since as honorary chairman, assisting chairmen in their duties as needed.

There are now fifty-five major Ferris paintings in the Air Force Art Collection.



We have certainly come a long way since the retirement of the NBS-1 at my birth. It has been a real privilege to have lived and participated in the history of these years.

Our 1956 decision to relocate and pursue a career as self employed freelance artist concentrating on the advertising, public relations and publications needs of the aerospace industry, publishers, the military and of aviation and space museums was vindicated. My fifty year list of commercial clientele has included almost every major airframe, engine and avionics manufacturer in the United States, with a number of foreign clients as well. Our income has come from the sale of reproduction rights in my art to clients, sale of original art, and from the sale of reproductions of the many Ferris works that have been published in limited and open edition print and poster form.

While I have never found the time to earn my private pilot's license, I have certainly been able to more than fulfill my dream of military flight. I am grateful to the Air Force and the Air Force Art Program for granting me the opportunity to convey flight and Air Force history through art.

I have been able to serve after all!



"Have G-Suit, Will Travel!" The artist with F-4E 67-268

Those interested in further information on the artist and his work, in viewing his studio, and seeing a gallery of his original paintings and prints, may visit the Ferris web site at: www.keithferrisart.com ■

Desert Storm and the Triumph



h of Joint Warfare Planning



Don D. Chipman

(Overleaf) A flight of Coalition F-15s and F-16s fly over burning desert oil fields.

The Promise of Air Power

Using new military technologies that promised to make the predictions of Douhet, Mitchell, and AWPD-1 war planners come true, Warden's staff expected to demonstrate the decisiveness of modern airpower and fulfill America's political objectives while essentially ignoring the Iraqi army in Kuwait.

Colonel Edward C. Mann III, USAF



Victory over the Iraqis in the 1991 Gulf War was a seminal event in the transformation of military power. In thirty-nine days, coalition air power overwhelmed the Iraqi air defense systems, destroyed a high percentage of their fielded forces and demolished many of Saddam Hussein's key communication and economic systems. On February 24th, coalition land forces launched a 100-hour offensive that forced the enemy to surrender. The effectiveness of the air war substantially enhanced the success of the land campaign. "By hammering Iraqi forces in the Kuwait Theater of Operations (KTO) from the beginning of the war," wrote Williamson Murray, "coalition air power destroyed whatever willingness most might have had to fight the ground battle with the kind of tenacity that they had displayed during the Iran-Iraq War."¹

There were many reasons for the decisive victory. Among these were better trained coalition servicemen; new technology, such as precision guided weapons, and stealth; the development of a unified joint doctrine, under the guidance of a Joint Forces Air Component Commander; and the overall leadership of the United States Central Command combatant commander, Gen. H. Norman Schwarzkopf.² Yet, even with all of these factors, ultimately the final victory depended on the proper application of air power. Over the battlefields, air power rained down bombs from the vertical flank in well designed operations which General Schwarzkopf later acknowledged: "I would have given my left arm if our Air Force could have had half the capability in Vietnam that it demonstrated in the Gulf."³

After the war, contentious discussions concerning the promise of air power surfaced. Many believed that the "strategic attack" portion of the Desert Storm air strategy defeated the Iraqis. Among those who advocated this position, U.S. Air Force Col. John A. Warden III was the most prominent voice. Repeatedly, he asserted that "it was the

strategic attack on Iraq which put it in a position where it was forced to accept the dictates of its opponents"⁴ However, others claimed the counter-land air campaign against the Iraqi fielded forces prompted the momentous victory.⁵

At the heart of this controversy was the question of the relative importance of the strategic attack air campaign initially developed by Warden and his Checkmate staff. Known as "Instant Thunder," their plan focused on using air power to attack Saddam Hussein's regime, communication facilities, transportation centers, air defense systems, and the electrical power grid. This proposed air campaign was designed to force the Saddam to withdraw from Kuwait within ten days. "Capturing or killing the state's leader has frequently been decisive," explained Warden.⁶

Yet, Warden also acknowledged that a pure decapitation strategy was very difficult to achieve. Consequently the next best approach would be to "paralyze" Iraq by attacking targets that would sever Saddam's control over his regime and the armed forces. By using precision weapons and stealth in concentrated attacks, dissidents would be encouraged to rebel against Saddam's regime and overthrow his dictatorship.⁷ With these goals in mind, Warden wanted nearly all air assets assigned to the strategic attack mission. "I would also make clearer the idea," concluded Warden, "that it is entirely possible to win a major competition without ever dealing with the opponent's fielded forces."⁸

Controversy concerning the effectiveness of the Gulf War strategic air attack mission emerged in 1995, when U.S. Air Force Col. Rich Reynolds published *The Heart of the Storm*.⁹ Reynolds described how Warden and his Checkmate staff developed the Instant Thunder strategy and how they attempted to assure others that air power alone could force Saddam to withdraw from Kuwait. Although many of Warden's concepts were folded into the final Desert Storm strategy, the original Instant Thunder air campaign—as designed by Checkmate—existed as a comprehensive plan for less than twenty days. On August 20th, after Instant Thunder was briefed to Coalition air planners in Riyadh, the Central Command's Air Component Commander set it aside. From that date forward Instant Thunder was used as a starting point for guiding the extensive planning of the final Desert Storm air strategy: a plan that was under continual redevelopment throughout the fall and winter 1990.

Without providing any analysis of eventual results of the coalition's air war against Iraq,

Don D. Chipman, PhD, is a professor of military studies who recently retired from Squadron Officer College, Air University. During the Vietnam War, as a naval flight officer, he flew air reconnaissance missions in support of Rolling Thunder and logged more than 300 combat hours. In 1998, he retired from the Naval Reserve in the rank of commander. He has published two books and numerous articles on warfare and other subjects. Currently he is engaged in writing a book on military leadership entitled, "The War Philosophers: A Classical Concept of Command."



A planning meeting, including Gen. Schwarzkopf (seated second from right) and Lt. Gen. Horner (standing second from left). Gen. Powell, Chairman of the Joint Chiefs of Staff is seated at far left, with Secretary of Defense Dick Cheney next to him.

THE MOST
THAT ONE
COULD SAY
ABOUT THE
AIR
CAMPAIGN
WAS THAT IT
... WON
THE WAR

Reynolds acknowledged that he wanted “to capture, in words, the process by which a disparate group of people conceived and helped forge the most successful air campaign the world has ever known.”¹⁰ While the author shied away from identifying the strategic air campaign as the ultimate reason for the Gulf War victory, he included the opinions of others who were not so reticent. One contributor explained the successes of the air component plan in these terms:

*In the end, of course, the Gulf war did in fact include a strategic air campaign, and the very least that one could say about it was that by so thoroughly destroying the Iraqis’ capability to conduct warfare, it permitted a relatively bloodless war—concluding ground operation by coalition army forces. The most that one could say about the air campaign was that it—in and of itself—won the war.*¹¹

Similar to Reynolds’ view the strategic attack air mission had other proponents. Many of these individuals claimed that Warden’s Instant Thunder formed the central core of the final Desert Storm air strategy and, therefore, it ushered in the victory. In *Crusade: The Untold Story of the Persian Gulf War*, Rick Atkinson contended that while the victory had many fathers, “yet no claim was stronger than Warden’s.”¹² Richard P. Hallion, author of *Storm over Iraq*, stated that “John Warden structured the thinking and approach that subsequently crystallized in the Desert Storm strategy air campaign plan.”¹³ While Warden received extensive credit for the air campaign’s many successes, his role in influencing the final design of overall Desert Storm strategy remained controversial.

Throughout this debate, Warden never claimed full credit for the Gulf War victory. However, he continued to believe that the strategic air attack missions were the major reasons why Saddam surren-

dered. Even though these air strikes were limited and there were many errors in execution, ultimately he noted, they were decisive. “It was strategic attack on Iraq,” explained Warden, “which put it in a position where it was forced to accept the dictates of its opponents and to suffer serious intrusion on its sovereignty since the end of the war.”¹⁴

While the strategic air attack portion of the Desert Storm strategy had many defenders, there were others who believed that the victory was a product of the complementary joint and coalition operations. U.S. Air Force General Chuck Horner regarded the original Instant Thunder air campaign plan as just too narrowly focused to be practical. As the coalition’s Joint Air Forces Component Commander, Horner was responsible for carrying out General Schwarzkopf’s orders. In trying to decide on the proper apportionment of aircraft for different air missions, Horner knew that Warden wanted most coalition air assets assigned to the strategic air attack mission. While Horner accepted that these operations were necessary to prepare the battlefield for a land invasion, he had to accommodate Schwarzkopf’s overall strategic intent by attacking the Iraqi ground forces in the fields. “Thus, any air plan that ignored the troops on the ground,” explained Horner “would be dead if presented to the CINC, (Commander-in-Chief).”¹⁵

In late August 1990, Warden flew to Riyadh to brief Horner on his Instant Thunder air campaign plan. Noting the lack of air assets assigned to the counter-land mission, Horner asked why more resources were not assigned to that mission. Warden dismissed his question by noting that the strategic attack mission and air superiority would obviate these concerns. “Ground forces aren’t important to [the] campaign,” said Warden. “I don’t believe they can move under [our] air superiority.”¹⁶ In terms of air power, Warden was a purist. He believed thoroughly in the promise of air power to defeat the Iraqis decisively.

Horner, however, had to forge an air strategy based on what he perceived as the threat from a very powerful Iraqi military and, therefore, his views differed from Warden’s. As Schwarzkopf’s air boss, Horner was responsible for all in-theater air assets and was tasked to develop a comprehensive air strategy. By late August—when coalition forces began arriving in great numbers—it became obvious that both Schwarzkopf and Chairman of the Joint Chiefs of Staff, Gen. Colin Powell, favored a coalition land assault. General Horner had a responsibility to support the Joint Force Commander’s objectives and therefore he needed an air component plan designed to attack both Saddam’s vital centers and his fielded forces. According to Michael R. Gordon and Bernard E. Trainor, “the allied offensive ultimately had to be guaranteed by ground power: Washington would not rely on air-power alone to defeat Iraq.”¹⁷

Acting as Horner’s deputy, Air Force Brig. Gen. Buster Glosson became the Chief of Central Command’s Special Planning Group. Like his boss, Glosson was reluctant to accept Warden’s promise



From right, Lt. Col. Dave Deptula, Gen. Schwarzkopf, and Brig. Gen. Glosson, with unidentified planner in the background.

IN THE "OLD DAYS ... IT WAS CALLED STRATEGIC ATTACK

PRIOR TO THE GULF WAR ... THE U.S. AIR FORCE WAS GENERALLY ALIGNED INTO TWO MAJOR DOCTRINAL CAMPS

of air power. He liked the Checkmate's targeting plan but was amazed how Warden could conclude that an air campaign would force Saddam's army to withdraw from Kuwait after only a few days of bombing. "My understanding of the target base for the Republican Guard and NBC [nuclear, biological, and chemical] alone was that even if every bomb was 100 percent successful, there was no way to finish in six-to-nine days." Basically exclaimed Glosson, "I needed an air campaign for a full 15 rounds not two or three ending up with just giving Saddam a bloody nose."¹⁸

Of all the critiques on the promise of air power none was more thoroughly documented than that of Robert A. Pape. In his post-Gulf War book, *Bombing to Win*, the author outlined how the strategic air campaign against Saddam was flawed and failed to achieve its goals.¹⁹ Pape claimed that the strategic air campaign did not destroy the Iraqi regime nor did it isolate Saddam from his fielded forces. "The air war," acknowledged Pape, "degraded communication between Baghdad and the KTO significantly but not enough to cripple Saddam's ability to direct theater-wide operations."²⁰ Despite all the strategic air attacks, Saddam and the Ba'athists remained in power.²¹

To this day, the controversy over relative effectiveness of the strategic air attacks continues. New research indicates that while the strategic attack mission made a serious contribution to the victory, it was only one portion of a four-part Desert Storm strategy. Throughout the fall of 1990, Generals Horner and Glosson and key members of the Central Command air staff rewrote and reconfigured the Desert Storm air component plan several times. Essentially, in terms of basic U.S. Air Force doctrine, the final draft included (1) a counter-air mission, (2) a counter-land mission, and (3) a strategic attack mission. Thus, noted Edward C Mann, the strategy as executed was an "airpower compromise:"

*Indeed, the final Desert Storm air campaign would ultimately attack every facet of Iraqi war-making capability, including war-production and force-deployment capabilities as well as Iraqi military forces in Kuwait (and some in Iraq) and the will of the Iraqi people to support the war and the oppressive regime of Saddam Hussein.*²²

But this synthesis, this single integrated air component plan, did not evolve without serious discussions over contentious air power promises that pre-dated Gulf War I. Eventually, as the Gulf War I approached and as time became critical, several of these key air power issues were ultimately settled by Generals Horner, Glosson, Schwarzkopf, and Powell in direct consultation with the President of the United States, George H. W. Bush.

Forging the Strategic Air Power Strategy

As strategists and operational artists, we must rid ourselves of the idea that the central feature of war is the clash of military forces. In strategic war, a clash may well take place, but it is not always necessary, should normally be avoided, and is almost always a means to an end and not an end in itself.

Col. John A Warden III.

In the last several decades new technologies and advances in air power have blurred the definition of strategic attack. In the "old days," when a bomber attacked the enemy's vital sources of power it was called strategic attack. Recently, this mission was redefined as any offensive action aimed at directly achieving national security objectives by striking the enemy's capabilities "from which a force derives its freedom of action, physical strength, or will to fight."²³ The determination of what elements comprised these capabilities, however sometimes varied. In the Gulf War, while Schwarzkopf claimed that the Iraqi fielded forces—and in particular, the Republican Guards—were some of Saddam's key conflict-sustaining resources; many of the Checkmate planners did not agree.²⁴ In the end of course, the combatant commander's desires prevailed.

Prior to the Gulf War, based on command structures and mission assignments the U.S. Air Force was generally aligned into two major doctrinal camps. The first school of thought included the Tactical Air Command that focused on the counter-land mission and was organized to support the U.S. Army in a major ground campaign against the Soviets. The centerpiece of their mission involved the U.S. Army's doctrine "Air-Land Battle" in which the U.S. Air Force provided support through air attacks from the vertical flank in terms of deep battlefield interdiction, interdiction, and close air support against attacking Soviet forces. The second school included the strategic attack mission which focused primarily on the delivery of nuclear weapons. The operational planning for the use of the B-52 bombers and the intercontinental missiles was assigned to the Air Force's Strategic Air

TWO
DISTINCT
GROUPS OF
AIRMEN
EVOLVED
DURING THIS
PERIOD

WARDEN DID
NOT WANT
TO ATTACK
THE IRAQI
POPULATION
PER SE

INSTANT THUNDER'S TARGET SYSTEMS				
1	2	3	4	5
Leadership	Key Production	Infra- Structure-	Population	Fielded Forces
Saddam's Regime Government	Electricity Petroleum	RR Bridges	Military Elites Ba'athist Foreign Workers	Strategic Air Defenses Strategic Offensive Systems (air & missile)
National Communications	Weapons of Mass Destruction			
Internal Security Forces			Middle Class	

Command. When the alarm sounded, these forces were expected to penetrate into the Soviet Union and destroy the enemy's war-sustaining centers of gravity.

Given these pre-Gulf War dispositions, noted one scholar, two distinct groups of airmen evolved during this period. The first was oriented toward the SAC view of strategic attack. The second group considered the use of air power in terms of "its tactical applications as a supportive element of a larger surface (land or maritime) campaign."²⁵ Consequently, as the Gulf War I approached, thinking diverged on how best to apply air power. Because of this dichotomy, noted Carl Builder, the Air Force was a divided community that had basically lost the conceptual framework for a coherent and comprehensive theory of air power involving the counter air, counter land, and the strategic attack missions.²⁶

Into this divergent intellectual climate entered John Warden. While attending the National War College, he began considering how air power could be applied in an operational theater using strategic attacks against the enemy's sources of strength. He wrote a thesis on the subject, which he eventually expanded into a book entitled, *The Air Campaign*.²⁷ The first task of any air commander, explained Warden, should be to gain air superiority. Once this was accomplished air power could then strike down the enemy's systems, which he described as the "enemy's interconnected components" in support of enemy military operations. "But for the foreseeable future, the petroleum net will be a strong candidate, as will the transportation net if it can be hit behind the enemy air field it is supporting."²⁸ Then focusing on what would later become his key centers of gravity, Warden acknowledged, "another potential target is the enemy's theater command and control system."²⁹

From these modest beginnings Warden would expand his strategic attack concepts in what he would later call his five-ring model. Looking like a dartboard, the bull's eye contained the essential strategic targets comprised of the enemy's vital centers and the regime's command and control systems. Significant industries, organic essentials, electrical systems and oil refining facilities comprised the second ring. The third was composed of the enemy's infrastructure, while the fourth

included the population and food production. Warden's fifth ring included the enemy's fielded forces and their air defense systems. In his mind, except for the enemy's air defense systems, the fifth ring contained the least important of all the aerial targets. Its primary function, he explained, was "to protect their own inner rings or to threaten those of the enemy"³⁰

Immediately after Iraq invaded Kuwait, Warden pulled together his Checkmate staff and began developing the Instant Thunder plan, based on his five-ring model. When General Schwarzkopf requested a comprehensive air plan from the Air Force, Warden stepped forth and briefed the commander. On August 10th, and again on August 16th, Warden and a few of his staff outlined their version of Instant Thunder. Basically they presented Combatant Commander with a series of key Iraqi targets which through the use of stealth and precision guided weapons could be readily destroyed. In the first column were the significant strategic targets. As indicated above, although Checkmate planned to attack the air defense systems in the fifth column, neither the Iraqi field forces nor the Republican Guard were designated as vital targets.³¹

While there were plans to strike all of the five target sets, Warden did not want to attack the Iraqi population per se. Schwarzkopf liked the Instant Thunder plan and wanted to know how long it would take to destroy these targets. Without hesitation and ready to promote the promise of air power, Warden claimed that by late September, with thirty-five air squadrons, the war would be over in six to nine days. With the promise of air power, Saddam would be willing to withdraw from Kuwait in ten days or less. Considering Iraq possessed the world's fourth largest military, Schwarzkopf was not totally accepting of this prediction and acknowledged that "even with double the airpower, his [Warden's] estimate seemed to be optimistic."³²

During these initial days, Schwarzkopf also began designing his own strategy, which included both a land component and an air component. Eventually these initial designs evolved into the four-phased Desert Storm strategy. In Phase I, based on Warden's suggestions, strategic air attacks would be launched against the Iraqi



Gen. Schwarzkopf addresses the troops.

SCHWARZKOPF HAD ESTABLISHED THE REQUIREMENT FOR A COUNTER-AIR MISSION, A STRATEGIC ATTACK MISSION AND A COUNTER-LAND MISSION

SCHWARZKOPF ANNOUNCED, ... I WANT THE REPUBLICAN GUARD BOMBED THE VERY FIRST DAY

regime, infrastructure and integrated air defense systems. Suppression of Iraqi air defenses in Kuwait comprised phase II of the plan. Phase III focused on a counter land air campaign against the enemy's field forces in preparation for Phase IV, the coalition's ground attack. Except for the last phase, all the air missions would be executed simultaneously. Within this construct were the seeds of the air doctrine compromise and development of integrated air strategy. By designing this initial plan, Schwarzkopf had established the requirement for a counter-air mission, a strategic attack mission and a counter-land mission.³³

At one point during Warden's second Instant Thunder briefing to Schwarzkopf, the general noticed that there were no designated air strikes against the Iraq's fielded forces. He told Warden that he wanted "fifty percent of the Iraqi occupying forces destroyed before launching whatever ground offensive we might eventually plan"³⁴ Very quickly there was an agreement that B-52s would target the enemy's fielded forces. And just to reinforce this request, Schwarzkopf announced, "okay, if it comes to this, I want the Republican Guard bombed the very first day, and I want them bombed every day after that." "They're the heart and soul of his army and therefore they will pay the price."³⁵ While Warden did not view the fielded forces as vital targets, Schwarzkopf believed they were one of the enemy's most vital war sustaining assets. They were centers of gravity.

About this time, Schwarzkopf ordered the strategic air campaign plan folded into a more comprehensive four-stage strategy, with emphasis on striking the enemy's fielded forces. Consequently the Instant Thunder concept was no longer a stand alone strategy. From this time forward all officers working for Schwarzkopf, and in particular, Generals Horner and Glosson were not only required to develop plans for a strategic attack against Saddam's regime, they were also required

to prepare for a counter land operation. "Alternatively," noted Gordon and Trainor, "Schwarzkopf saw the Instant Thunder plan as a precursor to an offensive plan, a way to reduce Iraqi strength prior to a ground war."³⁶

During these initial days the Instant Thunder staff also briefed General Powell. When Warden explained that the strategic air attacks might induce Saddam to withdraw his forces from Kuwait, the Chairman was impressed by the plan. Yet, he did not believe in this promise of air power and told the planners that he wanted to reap extensive damage upon the Iraqi fielded forces.³⁷ "I don't want them to go home—I want to leave smoking tanks as kilometer fence post all the way to Baghdad," he emphatically declared.³⁸

Acting on Schwarzkopf's and Powell's guidance, Warden expanded the original air campaign plan to include some strikes against the enemy's fielded forces. But the colonel was in a quandary. To prove that the promise of air power could be effective, he needed nearly all of the Desert Storm's aircraft to fly strategic attack sorties against Saddam's regime. "On strategic airpower," observed Gordon and Trainor, "he was a purist."³⁹

Later, Warden and three of his staffers headed for Saudi Arabia to brief General Horner. In this often described August 20th meeting, Warden outlined how strategic air strikes would destroy the Iraqi vital centers and force Saddam to yield. Horner, however, was concerned with the Iraqi threat just north of Riyadh. According to one Defense Intelligence Agency report, the Iraqis were continually moving new forces to the adjacent territories. By January 1991, this arena housed approximately 540,000 troops, 4,200 tanks, 2,800 armored personnel carriers, and 3,100 artillery pieces.⁴⁰ Another intelligence assessment claimed Saddam was seriously considering launching three heavy divisions into Saudi Arabia in hopes of capturing the oil fields and destabilizing the region.⁴¹

After listening to the Instant Thunder briefing, Horner pointed out that the plan did not possess a viable counter-land option to oppose Saddam's menacing land forces. When the general referred to this threat, Warden exclaimed, "You're being overly pessimistic about those tanks." "I don't believe they can move under [our] air superiority."⁴² In a bold message the Checkmate director claimed that the "Iraqi land forces were actually a detriment, a drain, less a threat than a hungry mass that had to be fed and supplied."⁴³ Warden believed in the promise of air power and siphoning off air assets to attack enemy troops on the ground was simply an improper path to victory.

The meeting between Warden and Horner was important because Central Command air planners now became well versed on the importance of the strategic attack mission. Initially at least, four of Warden's air planners remained in Riyadh to help forge the strategic part of the final Desert Storm air strategy.⁴⁴ Yet, given that the coalition command structure was directed by General Schwarzkopf, who viewed the war's preparation



Col. John A Warden III.

HORNER AND GLOSSON, ... RETAINED LT. COLS. DAVID DEPTULA, BERNARD E. HARVEY, RONNIE A STANFILL AND COL. STEVEN G. WILSON FROM THE CHECKMATE STAFF

from a Joint Forces Commander position and from a Joint Forces Land Component Commander's perspective, there was little doubt that the counter-land air campaign against Iraqi fielded force would be a major part of the final air strategy. "The major criticism of Instant Thunder," noted air power historian, Kenneth P. Werrell, "was that it was only a strategic bombing campaign and neglected the Iraqi Army in Kuwait and especially the Republican Guard that was the bulwark of the regime."⁴⁵

Beyond Strategic Air Power

The planning for the second, third, and fourth phases of the air campaign dealt with the Iraqi forces in the Kuwait theater. Initially deemed unnecessary by Warden and the Instant Thunder plan, attacks on these forces came to play a much larger role once the plan got to the theater.

Gulf War Air Power Survey

After Warden briefed General Horner he headed back to Washington. Horner and Glosston, however, retained Lt. Cols. David Deptula, Bernard E. Harvey, Ronnie A Stanfill and Col. Steven G. Wilson from the Checkmate staff to help integrate strategic attack mission into the overall strategy. While there were several other key participants, the planning of phases I, II and III of the Desert Storm air component strategy continued throughout the fall of 1990. During this period, while the coalition was slowly deploying more forces into Saudi Arabia, Iraq continued to reinforce their military in Kuwait. In the late fall, noted one estimate, Saddam sent another 250,000 troops into Kuwait bringing the total number to over 650,000.⁴⁶ In addition, the Iraqis had more than 700 combat aircraft and a multi-layered, sophisticated air defense systems located within this theater.⁴⁷

In the early days of fall, Schwarzkopf and Horner were worried about how to strike back at the enemy if Iraq should take any bold actions either against Saudi Arabia or against the American hostages they had captured in Kuwait. Thus, according to General Glosston, the first iteration of Central Command's air strategy became known as the "El Dorado Canyon Retaliatory Option."⁴⁸ With a limited number of air assets in the theater, Instant Thunder was used as a blueprint to plan retaliation strikes against Iraq if they displayed any aggressive tendencies. In general, these air attacks were designed to destroy the Iraqi leadership, nuclear and biological facilities, selected Republican Guard units, and Saddam's security forces. "For building a retaliatory plan," explained Glosston, "it [Instant Thunder] was very useful indeed."⁴⁹

As time passed and as more allied aircraft arrived, the Central Command staff continued the detailed designing of the Desert Storm air strategy. During this period, top leadership began shifting away from a defensive plan to an offensive strategy which included both land and air components. In October, with most of the air planning sufficiently accomplished, Horner sent Glosston to brief President George H. W. Bush. Before departing, Glosston met with Schwarzkopf to outline the highlights of the proposed air component strategy. The opening round would begin with attacks against the Iraqi air defense systems and Saddam's regime. On the second day, B-52s would begin the counter-land campaign by attacking the Republican Guard every hour on the hour. According to Glosston, the general was delighted with the strategy. "Most impressive war plan I have ever seen," exclaimed Schwarzkopf. "This is exactly what we need."⁵⁰

Once in Washington, Glosston met with the Joint Chiefs of Staff, where he outlined the air strategy and then headed to the White House. On October 11th he briefed the President on the design of the Desert Storm air strategy and received confirmation that "the offensive air campaign, in three phases, was a go."⁵¹ After Glosston finished, Army Lt. Col. Joseph Purvis, described the land component strategy. During this briefing, President Bush dismissed the idea of defeating Iraqis by air alone. Phase I, the strategic attack portion of the Desert Storm strategy, however was considered to be a very important part of the overall air component plan.⁵²

In the meantime, Secretary of the Air Force, Donald B. Rice, and Deputy Chief of Staff for Plans and Operations, Lt. Gen. Jimmie V. Adams, requested Warden to determine the viability of a counter-land campaign against the Iraqi ground forces. Eventually, in mid-October, using computer-generated calculations, Warden and his staff predicted that this part of the air campaign would be so successful it would nullify the need to conduct a coalition land campaign. According to historian Diane T. Putney, Warden continued to exhibit confidence in the promise of air power:



Brig. Gen. Glosson (left) and Lt. Col. Deptula.

The CINCENT's war plan now required that Warden expand his thinking about air power to include the counterland mission of Phase III. Once he began to focus on the attrition of the Iraqi ground forces, Warden anticipated results from the phases as optimistic as those he had projected for Phase I. In August he saw Phase I, in a little more than a week, forcing the Iraqi army to leave Kuwait. In October he saw Phase III, in less than two weeks, destroying the Iraqi army in Kuwait.⁵³

THE ORIGINAL INSTANT THUNDER AIR CAMPAIGN IDENTIFIED EIGHTY-FOUR KEY TARGETS, BY JANUARY THIS LIST HAD EXPANDED TO OVER 470

When Checkmate's counter-land campaign analysis arrived in Riyadh, General Glosson and his staff reconfigured the data to make it more "palatable" and "acceptable" to Generals Horner and Schwarzkopf.⁵⁴ Yet, even in this final report, Warden did not submit a comprehensive module designed to strike the Iraqi Republican Guard. Only later, after a special request from Colonel Deptula and General Glosson, did Warden and his staff prepare an air campaign plan to fulfill one of Schwarzkopf's most significant military objectives. Throughout this time, Warden continued to consider air strikes against the Iraqi fielded forces and especially the Republican Guard as a distraction from the strategic attack mission. "The Checkmate leader," explained Putney, "thought striking them as an unwise diversion of effort."⁵⁵

Into November, December and early January the Desert Storm air strategy was expanded by adding more targets, redefining flight procedures, and by developing better support functions. While the original Instant Thunder air campaign identified eighty-four key targets, by January this list had expanded to over 470. In terms of specific categories, Iraqi air defense targets increased from ten to more than fifty. There were three times more Iraqi railroad bridges identified as targets and enemy's command nodes also tripled. Iraqi airfields targets increased from seven to over thirty while the Republican Guard targets increased from zero

to thirty-seven. Eventually, as the war unfolded, explained Horner, the list had expanded to over a thousand targets.⁵⁶

The importance of the counter-land air campaign to the Central Command combatant commander was dramatically demonstrated in a confrontation just prior to the war's opening attack. On this occasion, General Glosson invited the General Schwarzkopf to visit his air staff planners and review the first two days of operations. On cue, Colonel Deptula outlined the intended initial air strikes. Seeing that the enemy's ground forces were not being attacked during the first twenty fours, Schwarzkopf became very disturbed and immediately ordered Glosson to strike the Republican Guards on the first day and every day afterwards. This incident was very revealing and indicated Schwarzkopf's priorities. "Although he accepted the centers of gravity laid out by John Warden and subsequently incorporated into the air campaign," explained Rick Atkinson, "his own focus was on Iraq's army, particularly the Republican Guard's three heavily armored divisions, which he sometimes referred to as the center of gravity."⁵⁷

In the final analysis, there was no doubt who was responsible for all aspects of the war. Reflecting on this and other clashes over the development of the final Desert Storm air strategy, General Horner stated, "I thank God Schwarzkopf was in the Gulf, because there was no wondering about which service doctrine was going to prevail."⁵⁸ Joint planning under the combatant commander's directions moved forward with all due speed. Consequently, on the war's opening day, the Desert Storm air strategy included plans for gaining air superiority, strategic attack, and a robust counter-land phase. In this war, the combatant commander's joint/coalition vision took precedence over the promise of air power.

A New Kind of Warfare

The world has just witnessed a new kind of warfare—hyperwar. It has seen a demonstration of the validity of strategic attack theory. We have moved from the age of the horse and the sail through the age of the battleship and the tank to the age of the airplane.

Col. John A Warden, III

After the war Warden wrote several articles countering those whom he believed were advocating outdated nineteenth century land-warfare principles. Because Carl von Clausewitz popularized the notion that the battlefield engagement was the essence of combat, Warden challenged officers to turn away from these antiquated principles and accept a proposal that a new kind of warfare based on the age of the airplane was emerging.⁵⁹ "Indeed, there is a new world building around us and the revolutions in politics, business, and war have happened and we must deal with them, not ignore them," pleaded Warden.⁶⁰

The colonel believed that Desert Storm was the



Trucks were unable to pass over the damaged bridge.

TECHNOLOGY HAS MADE POSSIBLE THE NEAR SIMULTANEOUS ATTACK ON EVERY STRATEGIC AND OPERATIONAL-LEVEL VULNERABILITY OF THE ENEMY

first example of an evolving new kind of warfare. Capitalizing on high technology, precise accuracy, and stealth, air power could attack the enemy's vital center in near-simultaneous operations. Sometime these attacks could be designed to totally destroy the target and sometimes they could be designed to disable a portion of the target and thus disrupt significant enemy capabilities. By paralyzing the enemy in a new type of warfare which Warden called "hyperwar or parallel war," aircraft could disrupt or destroy the enemy with air strikes from all different directions, at all times of the day.⁶¹ By using what Warden called the "inside to out warfare," aerial attacks could effectively spread strategic paralysis throughout the enemy's domain and forced them to surrender.⁶² "Doing so, especially if you have available precision weapons and stealth technology," acknowledged Warden, "allows far more rapid and more economical attainment of objectives than focusing efforts on tactical or even operational level targets."⁶³

But Warden knew that not everyone would accept the idea that a new kind of warfare was emerging. For many this "parallel warfare concept" was a radical idea. "Of course," noted Warden, "it is human nature to stay with the old ways of doing business, even when the external world has made the old ways obsolete or even dangerous."⁶⁴ Yet, the colonel continually tried to convince others that parallel warfare was rapidly becoming reality and they needed to accept this new paradigm. To accomplish his goal he began by not only explaining his ideas but by also attacking traditional war principles which he claimed were based on the land-centric teachings of Carl von Clausewitz.

In Warden's opinion, massing troops to attack the enemy in one serial battlefield engagement after another was bound to produce extensive casualties. This, he stated most emphatically, was simply not the best strategy for fighting contemporary wars.⁶⁵ In today's world of precision guided weapons, air power has given a new meaning to the

principle of mass and this fact alone has negated nineteenth century land-centric war fighting principles. "Clausewitz may have been right for his time and place and accompanying technology," emphasized Warden, "but it is not clear today if the actual clash of men on the front is the only way or the best way to wage war." "To the contrary, we suggest that it may be the most costly and least productive approach in perhaps the majority of cases."⁶⁶

At one point Warden used the analogy of the cave from Plato's *Republic* to illustrate that while parallel warfare had become a new reality, too many of Clausewitz's advocates were following the outdated illusive images of an old warfare style:⁶⁷

*Technology has made possible the near simultaneous attack on every strategic and operational-level vulnerability of the enemy. This parallel process of war, as opposed to the old serial form, makes very real what Clausewitz called the ideal form of war, the striking of blows everywhere at the same time. For Clausewitz, the ideal was a Platonian shadow on the back of the cave wall, never to be known by mortals. The shadow has materialized and nothing will be the same again.*⁶⁸

For Warden, more often than not, these shadow gazers continued to emphasize the narrow land-centric tactical elements of warfare, while overlooking the promise of air power. Consequently, he concluded they are "lost in a Clausewitzian world in which defeat of the enemy military forces becomes an end in itself rather than merely one of a number of possible means to a higher end."⁶⁹

Armed with the conviction that the age of the airplane has arrived and that strategic air attacks would defeat Saddam, Warden continued to maintain that a major Gulf War coalition land campaign was not necessary. At one point in the middle of the actual fighting, he proposed a plan to give aid to the Iraqi regular army stationed along the Saudi border. The goal of this plan was to encourage Iraqi conscripts to flee from their bunkers, and in mass head toward Baghdad to confront Saddam's regime with an armed rebellion designed to force the dictator to flee. When asked if the coalition should provide these rebellious Iraqi conscripts with bus transportation to Baghdad, Warden said yes. "That's right." "Sort of pat them and drop supplies for them on the way, sort of like bread crumbs leading back to Baghdad." "We wanted to provide close air support to them as they were marching north to Baghdad."⁷⁰ Always, in his mind, the enemy's conscripts were mere appendages that distracted from the importance of promise of air power.

In the days just before General Schwarzkopf launched the massive coalition ground assault into Kuwait and Iraq, Warden continued to advocate the importance of air power. On or about February 22nd the colonel met with the Secretary of Defense, Richard Cheney to outline how the war could still be won with air power only. The Secretary told him that a land campaign was needed to not only defeat the Iraqis, but totally humiliate the regime. In



A pair of F-4s fly over the desert.

**THE FINAL
DESERT
STORM
STRATEGY
WAS NOT
WARDEN'S
TO PLAN ...
CREDIT
BELONGS TO
GENERAL
SCHWARZ-
KOPF ...
GENERAL
POWELL AND
... GENERALS
HORNER AND
GLOSSON**

response, Warden assured Cheney that air power had already humiliated Saddam. "Listen," acknowledged Warden, "no military commander has ever been as humiliated as Saddam Hussein is up to this point because what we have done is, we have killed well in excess of 50 percent of this Army in generic terms, and we have done that at a loss of life on our side at that point of about 15 people." "That" he concluded "is overwhelmingly humiliating."⁷¹

Late into the war Warden never strayed from his beliefs. To the end he believed in the promise of air power and that it could alone defeat the Iraqis. For him the age of the airplane had arrived and a new kind of warfare was on the horizon. While some questioned if a revolution in military affairs had really transpired, for Warden there was no doubt. "In my view," he concluded, "the answer is unequivocal; the Gulf War was the first conflict in the first true military technological revolution in history."⁷²

There was no doubt that Warden and his Pentagon staff contributed a new vitality to the Gulf War's air component mission. Their focus on the strategic attack influenced Schwarzkopf's air planners to seriously consider the importance of paralyzing Saddam's regime. Yet, the final Desert Storm strategy was not Warden's to plan. That credit belongs to General Schwarzkopf who in turn relied on extensive advice from the Chairman of the Joint Chiefs of Staff, General Powell and from Generals Horner and Glosson.

In contrast to Warden's teachings, General Powell did not believe in the promises of air power or that a new kind of warfare was in the offing. In September 1990, after coalition forces began arriving in Saudi Arabia in force, the Chairman worked hard to ensure that the air power advocates were not overselling their proposals. While the President, a one time naval aviator, tended to see the air campaign as significant, Powell assured the White House that air power had its limitations.⁷³ During the October White House meeting, when the President specifically asked General Glosson if air power could win the war, General Powell was

quick to intervene. He told the President they must follow the Desert Storm strategy as planned. "You've got to be ready to do Phase IV (land campaign) because your objective won't be accomplished," he answered authoritatively.⁷⁴ Although the Chairman was somewhat vague in his logic, the President had no further questions.

A few weeks later, General Powell again headed to the White House with a new version of the Desert Storm strategy. He told the President that the war would begin with an air campaign and this would be followed by a ground war. Once again President Bush asked if air power without land forces could defeat the Iraqis. Emphatically, Powell answered, "I'd be the happiest soldier in the Army if the Iraqis turned tail when the bombs start falling." "If they do, you can take the expense for deploying the ground forces out of my pay." "But," he continued, "I reminded the group, history offered no encouragement that airpower alone would succeed."⁷⁵ The President agreed and for all practical purposes Warden's desire to prove the promise of air power was no longer a consideration.

Although President Bush viewed strategic air power as a possibility, he never seriously considered using it. He made this decision based on the advice he received from his military advisors who were determined to have a massive ground campaign. According to Gordon and Trainor, if President Bush had been convinced that air power could destroy the Iraqis then he would have encouraged Schwarzkopf to attack directly without adding more coalition forces or the 7th Corps in late November.⁷⁶ Toward the end of the war when Coalition forces were about to advance into Kuwait, President Bush remarked, "I have no qualms now about ordering a ground war—not at all."⁷⁷

According to the *Gulf War Air Power Survey*, while the strategic air campaign was partially successful, it did not defeat the Iraqis nor did it dismantle Saddam's regime as the Instant Thunder team had originally planned. On the positive side, it destroyed or disrupted most of the enemy's telecommunications systems, electrical grids, bridges, and oil refining capabilities. Yet at war's end, Saddam Hussein and his Ba'athist followers were still in power.⁷⁸ An indication of the regime's resilience came twelve days into the war when Saddam directed the Iraqis to launch a major ground offensive against the Saudi Arabian city of Al-Khafji, which was in part halted not by strategic air attacks but by a well designed counter land air campaign.⁷⁹

In combination the counter-air and counter-land air campaigns were very effective. Within three days Iraqi air defenses were suppressed and air superiority was gained. These successes were followed by strikes against the enemy's fielded forces where air power destroyed an estimated thirty-nine percent of the Iraqi's tanks, thirty-two percent of their armored personnel carriers and forty-seven percent of their artillery.⁸⁰ Eventually these attacks helped undermined the confidence that most of the Iraqi fielded forces had in their weapons and this led to a break-down of troop



An aerial picture of some of the damage inflicted during the air campaign.

“THE SUCCESSES OF THE AIR WAR IN THE GULF,” EXPLAINED ELIOT COHEN, “RESTED ALMOST AS MUCH ON ORGANIZATIONAL INNOVATION AS ON TECHNOLOGY.”

morale and willingness to fight.⁸¹ “What the events on the ground made clear,” noted the *Gulf War Air Power Survey*, “is that air power essentially paralyzed or demoralized the Iraqi heavy divisions on which Iraqi strategy depended.”⁸² Or as Gordon and Trainor concluded, “while the air-war commanders had not won the war in downtown Baghdad, they devastated the Iraqi army.”⁸³

From Route Packages to Integrated Planning

Looking back, I clearly erred by not forcing, then or later—in either Saigon or Washington—a knock-down, drag-out debate over the loose assumptions, unasked questions, and thin analysis underlying our military strategy in Vietnam.

Robert S. McNamara, Secretary of Defense, 1961-67

In his memoirs, Robert S. McNamara acknowledged that he did not properly analyze or plan the Vietnam War strategy.⁸⁴ This was not true of the Desert Storm planning process. From day one and throughout the war, there were continuous confrontations and serious discussions concerning the assumptions and proposals of the strategy’s various operational components. The volatility and significance of this dialectical process was clearly demonstrated when Secretary of Defense Richard B. Cheney suddenly dismissed one member of the Joint Chiefs of Staff for incautious comments concerning the war plans.⁸⁵

Because of the Goldwater-Nichols legislation, the theater combatant commander was responsible for the strategy. In turn, General Schwarzkopf appointed a coalition Forces Air Component Commander to design the air component strategy. Because of these organizational changes, as never before, air operations were well designed, coordinated and executed. “The successes of the air war in the gulf,” explained Eliot Cohen, “rested almost as much on organizational innovation as on technology.”⁸⁶

To no small extent, the Desert Storm planning approach was almost the antithesis of how the Vietnam air war strategy was developed. In the initial war years, without extensive military advice, President Lyndon B. Johnson and Secretary McNamara directed most of America’s air power strategy. Concerned that Red China might intervene, the President decided that U.S. forces would gradually increase their military pressure against North Vietnam through incremental air strikes. Even though the Joint Chiefs of Staff recognized that this gradual response strategy was flawed, for a variety of reasons, they did not provide the President with effective alternatives.⁸⁷ As a result, the war effort lacked a comprehensive strategy and it soon became a conflict of vague victories and major psychological defeats, all, with no end in sight. “American soldiers, airmen, and Marines went to war in Vietnam,” explained historian H. R. McMaster “without strategy or direction.”⁸⁸

Flaws in these war plans were most notable during the initial air campaigns over North Vietnam. Here, most historians have claimed that instead of following one comprehensive strategy, there were as many as five separate air wars conducted by five separate authorities. For instance, this planning approach called upon the U.S. Navy and Air Force to attack North Vietnam in six different target sections known as route packages. “The Air Force received responsibility for attacks in Route Packages 5 and 6A, the two northernmost zones containing Hanoi and the Northwest Railroad,” explained air power historian Mark Clodfelter. “The Navy had responsibility for Route Packages 2, 3, 4, and 6B, which together extended from the 18th parallel to China and included Haiphong and part of the Northeast Railroad.” “The absence of a single air commander,” concluded Clodfelter, “produced chaos.”⁸⁹

Twenty plus years later, during Desert Shield and Desert Storm, many of these planning and coordination problems had been mostly rectified. The air component planners on General Schwarzkopf’s staff integrated and synthesized the various tactical and strategic elements into a single joint/coalition air component plan designed to fulfill of the combatant commander’s intent. There were no route packages in the Gulf War. These successful air assaults involved hundreds of planes, flying from numerous bases, attacking from various directions and all providing comprehensive on-call air coverage around the clock. The victory was an affirmation of the new organizational scheme and an integrated joint planning process.

In the development of the final Desert Storm air plan, there were numerous proposals concerning the use of stealth and precision-guided weapons. In addition, designers had forged an air plan that prioritized the counter-air, counter-land and strategic attack missions. Over the course of time, these planners examined loose assumptions, asked serious questions and unmasked areas of thin analysis. In the end, they synthesized a strategy which effectively fulfilled the Joint Force

THE GULF WAR ... WAS MORE FUNDAMENTALLY ABOUT CONSENSUS BUILDING AND THE ORDERLY FORMATION OF NATIONAL GOALS

Commander's guidance.

For those involved in Checkmate, designing the strategic attack mission remained a focal point of most of their effort. Under Warden's guidance they wanted to present a plan that along with winning the war, would also demonstrate that a new kind of warfare had evolved; one based on the promise of air power. Yet, the assessments of the enemy's overall military power, the 500,000 plus enemy troops in Kuwait, the threat that Saddam may invade Saudi Arabia, and the political decisions that the war must include coalition forces and joint forces were factors which the combatant commander could not ignore, no matter how assured others were that a single service effort could defeat the enemy. Throughout the history of warfare there had never been a case where air power alone had defeated the enemy without engaged land forces. Thus, when these types of discussions surfaced, General Powell was quick to remind others of this basic historical fact. When the President asked the Chairman about Gulf War air power, Powell convincingly played down the promise of air power as a plan that was based on thin analysis and too many unanswered questions.⁹⁰

While General Powell gave great credit to Warden for his strategic insights, he also explained that the war required a sweeping land assault to destroy the Iraqis fielded forces.⁹¹ Thus for Generals Schwazkopf, Powell, Horner, and Glosson, the war required a single joint/coalition strategy; one which could only be possible by developing and adopting an integrated plan that included both a comprehensive air component and a land component. As Clausewitz once pointed out, these commanders were evaluating the salient fea-

tures of the conflict as they believed them to be and not for what they imagined them to be.⁹² They were judging the vague outlines on Plato's wall for what they were: shadows. While there were indications that a new kind of warfare was in the offering, the full understanding of those manifestations would have to wait for another time and another war.⁹³

In the end, noted Benjamin S. Lambeth, the Gulf War was not about new technologies, or stealth or precision guided weapons, although they were a part of it. Nor was it about the superiority of one type of offensive attack over another:

It was more fundamentally about consensus building and the orderly formation of national goals; about diplomacy and leadership in the pursuit of those goals; and about astute planning and coordination action by skilled professionals in the employment of military power; notably air power in this case, to achieve them once diplomacy and economic sanctions failed to carry the day. Insofar as the success of Desert Storm heralded a "revolution" in warfare, the revolution was in the fusion of all these ingredients into a winning combination.⁹⁴

In support of the combatant commander's objectives, the Joint Forces Air Component Commander devised a single integrated plan that led to the effective application of air power. Desert Storm proved the primacy of joint and coalition integration of forces. Ultimately, noted air power historian, Diane Putney, "the air campaign plan was not an Air Force, Navy, Marine Corps, or Army plan; it was the CINCCENT's plan."⁹⁵ It was a triumph in planning. ■

NOTES

1. Williamson Murray, *Air War in the Persian Gulf*, (Baltimore, Md.: The Nautical & Aviation Publishing Company of America, 1995) p. 303.

2. Benjamin S. Lambeth, *The Transformation of American Air Power* (Ithaca, N.Y.: Cornell University Press, 2000) pp. 148-52.

3. General H. Norman Schwarzkopf, *It Doesn't Take a Hero*, (New York: Bantam Books, 1992) p. 501.

4. John A Warden III, "Success In Modern War: A Response to Robert Pape's Bombing to Win," *Security Studies*, (Winter 1997/98) 172-90.

5. Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, N.Y.: Cornell University Press, 1996) pp. 246-48.

6. Colonel John A. Warden III, "Employing Air Power in the Twenty-first Century," in *The Future of Air Power*, Edited by Richard H. Shultz and Robert L. Pfaltzgraff, (Montgomery, Ala.: Air University Press, 1992) 57-82.

7. *Ibid.*

8. John A Warden III, *The Air Campaign*, (New York: toExcel Press, 2000) p. x.

9. Richard T. Reynolds, *Heart of the Storm: The Genesis of the Air Campaign Against Iraq* (Montgomery, Ala.: Air University Press, 1995)

10. *Ibid.* p. xii

11. *Ibid.* p. xii & xiii.

12. Rick Atkinson, *Crusade: The Untold Story of the*

Persian Gulf War (New York: Houghton Mifflin Company, 1991) p. 56.

13. Richard P. Hallion, *Storm over Iraq: Air Power and The Gulf War* (Washington, D.C.: Smithsonian Institution Press, 1992) p. 118.

14. Warden, *Security Studies*, 172-90.

15. Tom Clancy with General Chuck Horner, *Every Man A Tiger* (New York: G.P. Putnam's Sons, 1999) p. 275.

16. Reynolds, *Heart of the Storm*, p. 128.

17. Michael R. Gordon and General Bernard E. Trainor, *The Generals' War: The Inside Story of the Conflict in the Gulf* (New York: Little, Brown and Co. 1995) p. 179. General Charles Horner, USAF (Ret.) interviewed by author, June 30, 2004. General Horner said that General Powell wanted to totally defeat the Iraqi ground forces to preclude another invasion of Kuwait after the Coalition forces had withdrawn from the theater.

18. General Buster Glosson, *War with Iraq: Critical Lessons* (Charlotte, N.C.: By the Author, 2003) p. 17.

19. Pape, *Bombing to Win*, p. 221.

20. *Ibid.* p. 239.

21. *Ibid.* p. 221.

22. Edward C. Mann III, *Thunder and Lightning: Desert Storm and the Airpower Debates* (Montgomery, Ala.: Air University Press, 1995) p. 61.

23. United States Air Force, *Air Force Basic Doctrine Document 1* (Washington, D.C.: Department of the U.S. Air Force, 1997) p. 51.
24. Warden, *The Air Campaign*, p. 146.
25. Reynolds, *Heart of the Storm*, p. xi.
26. Carl H. Builder, *The Icarus Syndrome: The Role of Air Power Theory in the Evolution and Fate of the U.S. Air Force* (London: Transaction Publishers, 1998) p. 29.
27. Warden, *The Air Campaign*, p. xiii.
28. *Ibid.* p. 135.
29. *Ibid.*
30. Warden, *Future of Air Power*, p. 67.
31. Warden, *The Air Campaign*, p. 146.
32. Schwarzkopf, *It Doesn't Take a Hero*, p. 319.
33. *Ibid.* p. 320.
34. *Ibid.* p. 319.
35. *Ibid.* p. 320.
36. Gordon & Trainor, *Generals' War*, p. 90.
37. Colin L. Powell, *My American Journey*, (New York: Random House, 1995) p. 473.
38. Powell, quoted in Pape, *Bombing to Win*, p. 224 & in Reynolds, *Heart of the Storm*, pp. 72-73.
39. Gordon & Trainor, *Generals' War*, p. 89.
40. Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey: Summary Report*, (Washington D.C.: U.S. GPO, 1993) p. 8.
41. Robert H. Scales, Jr., *Certain Victory: United States Army in the Gulf War* (Washington D.C.: U.S. GPO, 1993) pp. 65-66.
42. Reynolds, *Heart of the Storm*, p. 128 and Diane T. Putney, *Airpower Advantage: Planning the Gulf War Air Campaign, 1989-1991* (Washington, D.C.: Air Force History and Museums Program, 2004) pp. 130-33.
43. Clancy and Horner, *Every Man a Tiger*, p. 263.
44. Maj. Gen. David Deptula interviewed by author, Feb. 10, 2003.
45. Kenneth P. Werrell, *Chasing the Silver Bullet: U.S. Air Force Weapons Development from Vietnam to Desert Storm* (Washington D. C.: Smithsonian Books, 2003) p. 225.
46. Keaney and Cohen, *Air Power Survey*, pp. 7-8.
47. *Ibid.*
48. Glosson, *War with Iraq*, pp. 19, 20, 31, 48. General Glosson called Phase I of the Desert Storm air strategy "The El Dorado Canyon Retaliatory Plan."
49. *Ibid.* p. 24.
50. *Ibid.* p. 38 and John A. Warden III, interview by author, Apr. 12, 2004. Warden stated General Powell told him that the U.S. Army needed an air plan to attrite the Iraqi ground forces by 50%. Consequently, Warden and Checkmate developed and forwarded to CENTCOM an air plan to attack the Iraqi fielded forces in Kuwait.
51. *Ibid.* p. 64.
52. Richard G. Davis, *On Target: The USAF in the Persian Gulf War* (Washington D.C.: Air Force History and Museums Program, 2002) p. 107 and 109 and Putney, *Airpower Advantage*, pp. 222-23.
53. Putney, *Airpower Advantage*, p. 235.
54. *Ibid.* p. 237.
55. *Ibid.* p. 239.
56. Clancy and Horner, *Every Man a Tiger*, p. 277.
57. Rick Atkinson, *Crusade*, pp. 107. General Charles Horner interviewed by the author, July 30, 2004. When General Schwarzkopf became angry, General Horner invited him to talk in private. General Schwarzkopf explained that he was under extreme pressure and tension.
58. Clancy and Horner, *Every Man a Tiger*, p. 475.
59. John A Warden III, interviewed by author, Apr. 12, 2004.
60. John A. Warden III, "Air Theory for the Twenty-first Century," in *Challenges and Response: Anticipating US Military Security Concerns*, edited by Dr. Karl P. Magyar, (Montgomery, Ala.: Air University Press, 1994) 311-332.
61. Warden, "Air Power in the Twenty-first Century," 57-82.
62. Warden, "Air Theory for Twenty-first Century," 311-32.
63. Warden, *Air Campaign*, p. x.
64. Warden, "Air Theory for Twenty-first Century," 311-32.
65. Warden, "Air Power in the Twenty-first Century," 57-82.
66. *Ibid.*
67. Plato, *The Republic*, Translated by H.D.P. Lee (Baltimore, Md.: Penguin Books, 1956) p. 279.
68. John A. Warden III, "The Enemy as a System," *Airpower Journal*, (Spring, 1995) available from <http://www.airpower.maxwell.af.mil/airchronicles/apj/warden.html>, 1-14.
69. Warden, "A Response to Robert Pape's Bombing to Win," 172-90.
70. John A Warden III, Washington D. C., Oral History Interview by Suzanne Gheri, Dec. 10, 1991, in Desert Story Collection, call number K239,0472-115. US Air Force Historical Research Agency, Air University, Maxwell Air Forces Base, Montgomery, Ala., pp. 118-20.
71. Warden, Oral History Interview, p. 50.
72. Warden, *Air Campaign*, p. 160.
73. Powell, *American Journey*, p. 476.
74. Glosson, *War with Iraq*, p. 63.
75. Powell, *American Journey*, p. 489.
76. Gordon and Trainor, *Generals' War*, p. 139.
77. George H. Bush, *All the Best: My life in Letters and Other Writings* (New York: Scribner Publisher, 1999) p. 511.
78. Keaney and Cohen, *Gulf War Air Power Survey, Summary Report*, p. 70.
79. *Ibid.* p. 19.
80. *Ibid.* p. 105.
81. *Ibid.* p. 117.
82. *Ibid.* p. 116.
83. Gordon and Trainor, *Generals' War*, p. 331.
84. Robert S. McNamara with Brian Van DeMark, In *Retrospect: The Tragedy and Lesson of Vietnam* (New York: Random House, 1995) p. 203.
85. Eliot A. Cohen, *Supreme Command: Soldiers, Statesmen, and Leadership in Wartime*, (New York: The Free Press, 2002) p. 191.
86. Eliot A. Cohen, "The Mystique of U.S. Air Power," *Foreign Affairs*, (January/February, 1994) 109-24.
87. H. R. McMaster, *Dereliction of Duty* (New York: Harper Collins Publishers, 1997) p. 327-28.
88. *Ibid.* pp. 275.
89. Mark Clodfelter, *The Limits of Air Power: The America Bombing of North Vietnam*, (New York: The Free Press, 1989) p. 128-29.
90. Powell, *American Journey*, p. 489.
91. *Ibid.* p. 488.
92. Carl von Clausewitz, *On War*, Edited by Michael Howard and Peter Paret, (Princeton, N.J.: Princeton University Press, 1976) p. 88. "The first, the supreme, the most far-reaching act of judgment that the statesman and commander have to make is to establish by that test that kind of war on which they are embarking; neither taking it for, nor trying to turn it into, something that is alien to its nature." "This is the first of all strategic questions and the most comprehensive."
93. John A Warden III, interviewed by author, May 5, 2004. Warden stated that the promise of air power was validated during the 1999 Operation Allied Force against the Serbs. In this war, no major allied land forces were involved. Consequently he noted, strategic air attacks alone overwhelmed Yugoslavian President Slobodan Milosevic and forced the Serbs to surrender.
94. Lambeth, *Transformation of American Air Power*, p. 152.
95. Putney, *Airpower Advantage*, p. 347.

Images of Three: A History of the First British Aeroplane Unit, Volume I Pre 1918. CD-ROM by The Archive Britain Campaign. Realvision Imaging Solutions Ltd, 2001. Diagrams. Photographs. Index. \$19.95. ISBN: 1-903129-29-X and **Early Aviation: the Pioneering Years through to the First World War.** CD-ROM by The Archive Britain Campaign. Realvision Imaging Solutions Ltd, 2000. Photographs. Index. \$19.95. ISBN: 1-903129-22-2

These two CD-ROMs are part of a large set of discs devoted to many facets of British history. While the subject matter holds great potential, the quality was less than I had hoped for.

Both of the discs were for PCs only; I could not ascertain whether there are Macintosh versions available. When opened, they immediately show a title page and a sidebar with an index in scroll-bar format. This was fine for photographs but a bit cumbersome for narratives and documents. For a 20-page document, the viewer has to open each page individually by going back to the scroll-bar. Printing is virtually impossible. I could not get any long document to print over one page. Even copying text to a word-processor page proved to be impossible because one can copy only the top part of any document. Photos could be saved individually.

Images of Three deals with Royal Flying Corps No. 3 Squadron which was founded on May 13, 1912. Of the first three RFC units, No. 3 was the only squadron which already had aircraft and was, therefore, the first heavier-than-air unit in the UK. The first part of the CD contains narratives on various aspects of the unit's history. Unfortunately, these are poorly formatted and replete with typos. Even the title sheet shows, "A Histoty [sic] of . . ." The second section contains a rich collection of several hundred photos of varying quality. Some of the aircraft presented are the entire BE series, Bleriot XI/XII/XXI, several Henry Farman types, many shots of the Sopwith Camel, and several rare models such as the Paulhan and Valkyrie Type B aircraft. The final section is documentation. Such items as letters from the king, organization charts, policies, and combat reports are given.

Early Aviation is "A classic collection of over 400 different photographs and other illustrations of early aircraft, airships and gliders which have been digitally imaged from original glass plate negative/lantern slides in the [Royal Aeronautical] Society's extensive photographic archive." All true, but just try to find them easily in the hodge-podge scroll-bar index! I could not figure out any rhyme or reason to the organization of the listings. The photos deal with aircraft all the way from Henson's Aerial Steam Carriage of 1843 through designs of World War I—including a number of British airships—and range from the obscure to the famous (Cody Cow, Bristol-built Farman

boxkite, U.S. Navy Burgess Flying Boat, et al.). There are also pictures of some of the famous and not-so-famous early British aviation personalities (Tommy Sopwith, Hiram Maxim, H.E. Watkins, and Claude Grahame-White to name a few). But the labeling of these pictures varies from fairly definite to "what is this and why am I looking at it?" One picture is labeled simply, "Aircraft Propeller." One can see that it's on a Bleriot, but there is no information about the aircraft or the prop. Another is labeled "Landing Chassis," but there is no identification of the aircraft—just a picture of a couple of wheels and some surrounding structure!

All in all, I was disappointed in the discs. The pictures are nice to look at, but I'm not sure how much one can learn from them. Unless you really need some early information on No. 3 Squadron or just want something to look at on your computer, spend your money on any of several good books covering early aircraft.

Col. Scott A. Willey, USAF (Ret.), NASM
Docent and Volunteer



December 8, 1941: MacArthur's Pearl Harbor. By William H. Bartsch. College Station: Texas A&M University Press, 2003. Notes. Maps. Photographs. Index. Appendices. Bibliography. Pp. viii, 557. \$40.00 ISBN 1-58544-246-1

This book will undoubtedly be the final word on the disaster in the Philippines. In fact, it could have just as easily been entitled, *Clark Field: Case Closed*. It is so meticulously researched and written that it is impossible to argue against anything in the book.

Bartsch, who authored *Doomed at the Start* (1991) about the USAAF in the Philippines from the outbreak of the war until the surrender of Bataan, was probably prompted to write this as a result of Geoffrey Perret's favorable biography of MacArthur, *Old Soldiers Never Die* (1996). In Perret's account of the Japanese attack on the Philippines on December 8, 1941 (because the Philippines is across the international dateline, Pearl Harbor was attacked on December 7th, while American forces in the Philippines received the Japanese attack a few hours later but technically the next day), it was the leadership of the senior airmen in the islands that failed MacArthur, allowing the enemy to destroy the U.S. aircraft on the ground.

In 1997, Bartsch published a rebuttal to Perret in *Air Power History* entitled, "Was MacArthur Ill-Served by His Air Force Commanders in the Philippines?" (Summer 1997). In that article, Bartsch successfully defended the airmen, but it seems only to have whetted his appetite to set the record

straight in a book-length format. Six years later we have *December 8, 1941*, and it was well worth the wait.

The title might be a little misleading, as the author devotes over half of the narrative to introducing the key players in the USAAF, the conditions under which they operated, the equipment they possessed, and the sequence of events. Through Bartsch's pen we truly do get a view of how it really was in those last months of peace and first moments of war.

By interviewing thirty-seven veterans and relying on more than fifty other interviews stored at archives around the country as well as hundreds of letters and diaries, memoirs, and published histories, Bartsch meticulously studied and reconstructed the day-by-day events leading up to the war and the minute-by-minute action on December 8th.

In the end, Bartsch convincingly shows that MacArthur simply did not understand air power, its capabilities, or how to employ it. MacArthur allowed himself to be cloistered away in his office for several crucial hours after learning the news of the attack in Hawaii. The airmen under his command did everything possible in attempting to get orders that possibly could have avoided the disaster that later overtook him, to no avail. By the time MacArthur recovered enough from the shock of war to authorize a B-17 strike on Formosa, it was too late. The Japanese attack caught much of the 24th Pursuit Group's P-40Bs and the 19th Bomb Group's bombers on the ground, effectively emasculating MacArthur's strike arm.

This book will be welcomed by students of air power, World War II, and MacArthur, and will be the text of reference for years to come.

Lt. Col. Jim Gates, USAF, National Defense University



Fallen Astronauts: Heroes Who Died Reaching for the Moon. By Colin Burgess and Kate Doolan, with Bert Vis. Lincoln and London: University of Nebraska Press, 2003. Photographs. References. Index. Pp. xxiii, 272. \$25.00 Paperback ISBN: 0-8032-6212-4

The astronauts and cosmonauts of the 1960s aspired to venture courageously through the blackness of space and onward to the Moon. Tragically, the hand of fate cut some lives short, depriving at least sixteen—eight astronauts and eight cosmonauts—of chances to fulfill their dreams. Captains Theodore Freeman (USAF) and Charles Bassett II (USAF), Elliott See Jr., and Major Clifton Williams Jr. (USMC), as well as Colonel Yuri Gagarin, the first human to orbit the earth, died in aircraft crashes. Fire in a pressure chamber during advanced space training killed Senior Lieutenant

Valentin Bondarenko early in 1961, and a tangled parachute during the Soyuz 1 reentry doomed Colonel-Engineer Vladimir Komarov in 1967. The Apollo 1 capsule fire consumed Lieutenant Colonels Virgil Grissom (USAF) and Edward White II (USAF) along with Lieutenant Commander Roger Chaffee (USN) on January 27, 1967. Four years later, Lieutenant Colonel Georgy Dobrovolsky, Viktor Patsayev, and Vladislav Volkov were asphyxiated when their Soyuz 11 spacecraft catastrophically depressurized during reentry. An automobile accident claimed the life of Major Edward Givens Jr. (USAF), and disgraced, former cosmonaut Captain Grigori Nelyubov staggered into the path of an oncoming train. Finally, Colonel Pavel Belyayev died from complications following surgery for a bleeding ulcer.

In *Fallen Astronauts*, a compilation of mini-biographies, readers find emotionally moving, factually detailed portraits of the above-mentioned heroes. Authors Colin Burgess, Kate Doolan, and Bert Vis culled material from published sources, archival collections, and oral interviews with former colleagues, friends, and members of the deceased astronauts' families to capture each individual's personality in a touching, balanced way. Their respective contributions to the advancement of space flight become clear, as does the price of lives lost in pursuit of a vision. A warm, heartfelt tribute to those spacemen who died before reaching the Moon, this book also serves as a chilling reminder that we should not measure the

cost of space exploration in money alone. With each loss of life, Americans and Russians alike paid a premium for Neil Armstrong's "one small step."

The depth and breadth of research underpinning *Fallen Astronauts* is commendable. In the book's foreword, Gemini and Apollo astronaut Eugene Cernan, the last man on the Moon, remarks on the authors' impressive ability to uncover so many new facts and fresh anecdotes after more than thirty years. Not only did they derive much information from families of the deceased spacemen, they asked at least one member of each family to check meticulously the chapter about their loved one. That process helped avoid repetition of incorrect stories from old magazines and newspapers. Filtering untruths from the biographies of the fallen cosmonauts presented spaceflight researcher Bert Vis with an especially delicate challenge, because decades of state-manufactured exaggeration and glorification obscured much of the truth about their lives and deaths.

If any deficiency mars this otherwise masterfully written, sometimes heartrending volume, it is the lack of scholarly annotation to indicate where the authors' obtained specific information. While this reviewer does not doubt the rigorous methodology described in the book's introduction, the absence of detailed footnotes or endnotes will stymie scholars who might wish to check the authenticity or derivation of certain factual statements or analytical

perspectives. This flaw aside, *Fallen Astronauts* should be on every space enthusiast's reading list.

Dr. Rick W. Sturdevant, Deputy Command Historian, HQ Air Force Space Command



It Happened at Bakers Creek, Australia: A History of the Fifth Air Force's Worst Air Crash in World War II. By Robert S. Cutler. Hickam AFB, Hawaii: PACAF/HO, 2003. Maps. Photographs. Notes. Bibliography. Appendices. Pp. xii, 84. Paperback

Fifteen years ago, Robert Cutler, a professor of engineering management at George Washington University, discovered an entry in his late father's diary of his World War II experiences in the Southwest Pacific. This discovery triggered a crusade to unearth all details of the cited event. On June 14, 1943, Capt. Samuel L. Cutler, a ground officer of the Fifth Air Force, recorded the crash at Mackay, northeast Australia, of a B-17C that had just taken off from that small town with thirty-five Air Force officers and enlisted men on an R&R trip. Cutler was personally involved in the event, for he had supervised the loading of the men on the old bomber. The war-weary B-17 had been pressed into service as a transport after it had been written off as a combat aircraft, following a bombing mission to the southern

THE BATTLE OF BRITAIN

Air Defence of Great Britain, Vol. II

T C G James

Edited and with an Introduction by Sebastian Cox, *Head of the Air Historical Branch of the Ministry of Defence*

Foreword by Air Chief Marshal Sir Peter Squire

'there can be nothing but praise for such a majestic, seminal history as this one.' *Air Pictorial*

This volume offers the reader access to the RAF's detailed contemporary day-by-day account of the Battle.

456 pages illus 2000

0 7146 5123 0 cloth \$62.50/£45.00 0 7146 8149 0 paper \$26.50/£18.50

Royal Air Force Official Histories

COURAGE AND AIR WARFARE

The Allied Aircrew Experience in the Second World War

Mark K Wells, *Deputy Head of the United States Airforce Academy's Department of History*

Winner-Society for Military History Distinguished Book of the Year 1997

'Courage and Air Warfare is well written and well researched. It is relevant especially to those who would aspire to the command of flying units. Give it a very high place on your reading list.'

Dr David Mets, Maxwell AFB, Alabama, Airpower Journal

256 pages illus 1995 repr. 1997, 2000

0 7146 4618 0 cloth \$59.50/£42.50 0 7146 4148 0 paper \$24.50/£17.50

Frank Cass Publishers

North American Orders: ISBS, 5824 NE Hassalo Street, Portland, OR 97213 3644, USA Tel: 800 944 6190 Fax: 503 280 8832

UK/RoW Orders: Crown House, 47 Chase Side, Southgate, London N14 5BP Tel +44 (0)20 8920 2100 Fax: +44 (0)20 8447 8548

Website: www.frankcass.com

AIR POWER HISTORY

Turning Points from Kitty Hawk to Kosovo

Peter Gray, *Director of Defence Studies for the Royal Air Force* and Sebastian Cox, *Head of the Air Historical Branch of the Ministry of Defence* (Eds)

Contributors from academia and the services examine the theory and practice of air power from its earliest inception.

288 pages 2002

0 7146 5291 1 cloth \$64.50/£45.00 0 7146 8257 8 paper \$26.50/£18.50

STRATEGIC AIR POWER AND THE GULF WAR

John Andreas Olsen, *Royal Norwegian Air Force Academy*

Olsen provides a comprehensive examination of the origins, evolution and implementation of 'Operation Desert Storm' using official military and political documentation, interviews with US Air Force officers and Iraqis with experience of the inner workings of the Iraqi regime.

256 pages 2003

0 7146 5193 1 cloth \$62.50/£45.00 0 7146 8195 4 paper \$26.50/£18.50

Philippines from Australia on December 25, 1941. Immediately after the Mackay accident, Captain Cutler visited the crash site and was shaken by the terrible scene he would record in his diary that day.

In this highly-readable and carefully documented account of the crash—the worst in terms of loss of life in the Southwest Pacific in World War II—Cutler details the operational history of the old Philippines veteran that had miraculously survived the attack on Clark Field of December 8, 1941, only to end its life so tragically. But the emphasis of this monograph is on the human dimensions of the tragedy—the loss of life of thirty-four passengers and the six crewmen. Cutler had to overcome wartime censorship, classification of records until 1958, and only scattered archival references to the victims to put together this story. He and another equally driven researcher, retired MSgt Ted Hanks, succeeded in identifying the passengers and locating their families to share with them the details of what happened to them, information never before related to the relatives of the victims by the Air Force.

Cutler has also described in his monograph how the citizens of Mackay—in 1943 a town of only 12,000 that was a recreation area for airmen on leave from the New Guinea combat zone—remembered the loss of their wartime friends over the past sixty years. In 1992 they erected a memorial to them and have held annual ceremonies in honor of them.

This monograph published by the Office of History of the Pacific Air Forces presents the first detailed account of this tragic event. Not only the families of the victims but also the public as a whole owe a debt of gratitude to Cutler and Hanks for their tireless efforts to uncover and share the facts of the disaster.

In 2004 a book version of the author's story was published in Australia as *Mackay's Flying Fortress* by Central Queensland University Press, copies of which are available via the author.

William H. Bartsch, Reston, Virginia



The Cambridge Aerospace Dictionary. By Bill Gunston, Editor. New York: Cambridge University Press, 2004. Appendices. Pp. vii, 741. \$75.00 ISBN: 0-521-84140-2.

Bill Gunston has authored more than 300 books, mostly on aeronautical topics. He is an editor with Jane's Information Group and is a former RAF pilot. This is the fourth edition of this dictionary and the first with Cambridge in the title, since Cambridge University Press is now the publisher.

This is a British dictionary, though Gunston has taken great care to also include U.S. terms and spellings. As he puts it, "This dictionary is centred [centered] at least in

mid-Atlantic, if not further west." Any dictionary, especially one this specialized, is subject to criticism for the choice of words it includes or omits. Gunston tackles this dilemma head-on in an entertaining foreword. His goal is a useful product, and he has succeeded.

I reviewed this dictionary from the perspective of an American interested in aviation history, primarily of the U.S. but also of our English-speaking friends who might read the occasional British document or account as well. I felt this viewpoint would be fairly typical of *Air Power History* readers.

To have a useful basis of comparison, I pulled two other references off the bookshelf: Baughman's 1951 *Aviation Dictionary and Reference Guide*, and Heflin's 1956 *The United States Air Force Dictionary*. Then I made a list of terms and looked them up in each book.

All three dictionaries included Caterpillar Club, runway, ground loop, Mach number, napalm, meridian, isobar, and VOR. Gunston's dictionary matches Heflin's on such terms as air base, airdrome, aerodrome, CAVU, Very, and PSP; Baughman's had none of these. Gunston listed NDB, while neither Baughman nor Heflin did. Checking a bit closer in the A section, I discovered entries for Air-Dek and AM-2. Neither of these is listed in Baughman or Heflin.

My unscientific sample focused on historical terms, but modern terms such as MOOTW and AEF also abound in Gunston's work. U.S. Air Force commands and field operating agencies are listed, although several are years out of date (AFMEA is listed, but it's been redesignated three times since it had that name). The *Cambridge Aerospace Dictionary* also includes several useful appendices, examples being NATO Reporting Names, Civil aircraft registrations, and four different phonetic alphabets.

Don't let the British angle keep you from buying this book. Although the hefty price tag may deter some, the definitions are useful, and the coverage is broad. As I was pleased to find, Gunston has included American terms not found even in American dictionaries.

This dictionary will please those studying aviation and aerospace topics both historical and current. It will also be handy for readers of British aviation or aerospace periodicals. It is recommended for serious researchers and, especially, libraries with aviation or aerospace collections.

Scott D. Murdock, independent historical researcher



A-10s Over Kosovo: The Victory of Airpower over a Fielded Army as Told by the Airmen Who Fought in Operation Allied Force [OAF]. By Col. Christopher Haave and Lt. Col. Phil Haun. Maxwell AFB Ala.: Air University Press,

2003. Maps. Diagrams. Illustrations. Photographs. Notes. Appendices. Glossary. Bibliography. Index. Pp. xxxiv, 332. Paperback ISBN: 1-58566-122-8

I think it was Claire Chennault who said that pilots are not supposed to waste their time writing. The quote was something like, "The hand that touches the throttle cannot touch the pen." This book, about young pilots flying A-10s in combat over Kosovo (and Serbia), gives lie to that dictum. This is a well written and interesting work produced by two veteran Hog drivers—sorry, A-10 pilots—who have also attained high academic credentials. They weave together a series of vignettes in which they and several other pilots and support personnel share individual memories of their participation in the conflict.

I enjoyed this book, but having flown A-10s throughout the 1980s, I am biased. Let me start, then, with some criticism. The maps need a little work; good maps are critical to describing combat from the air and should be clear with a distance scale and a North reference. Also, the technical jargon is often overdone; too much can make a book unappealing to a non-military audience. Further, the authors could have included some vignettes from the Air Guard A-10 guys who also flew in the conflict. But these are relatively minor items and detract little from the product.

In focused form, the story line follows the 40th Expeditionary Operations Group which operated from Italy. The air campaign lasted seventy-eight days; A-10s were in it from beginning to end. But participation varied starting with duty as combat search and rescue (CSAR) assets. A-10 pilots train earnestly for this mission. As directed, they maintained aircraft on alert for this mission and were key components in the successful rescues of an F-117 pilot and F-16 pilot. Haun recaps the F-117 rescue in one vignette rich in tactical knowledge and lessons hard-learned.

But Hog drivers did not want to just pull CSAR alert; they wanted to get into the larger fight. They were finally able to fly some strike missions and progress to airborne forward air control (AFAC) and, ultimately, to mission command of large integrated coalition strike packages. Along the way, they learned and, in some cases, relearned many realities of aerial combat. They learned the value of carrying binoculars but then realized they were vulnerable to unobserved enemy fire. That is best solved by having a wingman in position to provide lookout when the flight lead is "heads down." They learned about enemy efforts at deception. Initially fooled on several early missions into striking dummy targets, the guys rediscovered the value of good intelligence and became familiar with enemy patterns. And in a reversal of roles, the airmen themselves began to utilize various deceptive tactics to confuse the enemy below. As the war



INTO THE WILD BLUE YONDER

My Life in the Air Force

ALLAN T. STEIN

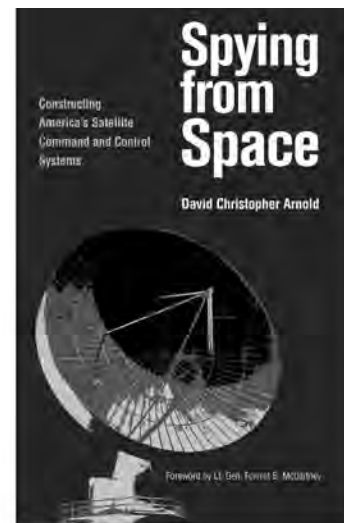
By the time he retired as a lieutenant colonel in 1969, Allan T. Stein had flown everything from BT-13s and B-24s to B-52s and C-47s. He flew missions over China and the Sea of Japan during World War II, spent a year in Vietnam helping to monitor and locate Vietcong units, and ended his career as inspector general of the Civil Air Patrol. Here he offers an account of his career as an air force officer. \$29.95



FROM THE PILOT FACTORY, 1942

WILLIAM P. MITCHELL

As a result of the need for manpower in the skies during World War II, the U.S. Army Air Force trained over 193,000 men as pilots between 1939 and 1945—making it a veritable “factory.” William Mitchell’s wartime letters share his experiences first at the pilot factory and then as an enlisted pilot and give glimpses into an era that now seems innocent and naïve. \$32.95



SPYING FROM SPACE

Constructing America's Satellite Command and Control Systems

DAVID CHRISTOPHER ARNOLD

Arnold tells the story of how military officers and civilian contractors built the Air Force Satellite Control Facility (AFSCF) to support the National Reconnaissance Program. These organizations made possible the development of the command and control systems that made rockets and satellites useful. This book offers a revealing look into a little-known aspect of space history. \$48.00



New in Paper:

AMERICAN MILITARY AVIATION

The Indispensable Arm

CHARLES J. GROSS

Gross traces the development of American military air power from the Wright brothers' triumph to the air war for Kosovo. He explains the roles of politics, economics, and technology in shaping U.S. air power. The evolution of the air arms of each of the different services and analyses of military budgets are also provided in this book that has been adopted as a standard text in Air Force ROTC programs.

\$19.95 paper

TEXAS A&M
University Press

www.tamu.edu/upress

800-826-8911

Fax: 888-617-2421

played out, they performed just about every mission the A-10 could do from AFAC to interdiction to reconnaissance to weapons delivery.

As missions mounted in number, the toll on aircraft was heavy; they began to break. Several writers appreciatively comment about the stellar efforts of the aircraft and weapons maintainers who kept them in the air. They also express deep appreciation for the other support troops of many specialties who provided background support so necessary for combat operations.

Much of the story is personal. One young pilot talks passionately about how difficult it was to tell his young wife that he was going off to war. Another, in revealing the intense bonding which can develop between airmen at war, said, "My biggest fear...was not being shot down – but failing my flight lead." A new flight lead, as he took off on his first mission, silently prayed, "Please, God, don't let me screw this up." Another pilot wrote an absolutely riveting rendition of his recovery of an A-10 which suffered a dual engine failure, while he flew through heavy weather. These themes are really timeless and have been documented before in classical works like *Stuka Pilot* and *Thud Ridge*. This book adds richly to that lineage.

I found one last point personally satisfying. When the A-10 was introduced in the 1970s, the USAF initially manned it primarily with experienced pilots who flew O-1s, O-2s, OV-10s, and A-1s in Vietnam. They brought into the A-10 community a vast richness of combat experience, that they infused into the younger brotherhood of pilots. This book's vignettes make it obvious that those efforts paid rich dividends. In the concluding chapter, one author writes, "The heroes that today's A-10 community holds in high regard include the Raven, Misty, and Nail FACs, as well as the Sandy CSAR warriors of previous wars." As a member of that earlier group, I return your salute, and thank you for a fine piece of work.

Darrel Whitcomb, Fairfax, Virginia



Valley of Decision: The Siege of Khe Sanh. By John Prados and Ray W. Stubbe. Annapolis, Maryland: Naval Institute Press, 2004 [Original Ed. Houghton Mifflin, 1991]. Maps. Photographs. Acronyms and Abbreviations. Notes. Bibliography. Index. Pp. 551. \$21.95 Paperback. ISBN: 1-59114-696-8

This book is a reprint of the original published in 1991. While a great deal of time has passed and further research has revealed new information about the Vietnam War, the authors offer nothing beyond what originally appeared in the hardback edition of the book. Be that as it may, *Valley of Decision* deserves a slot on the bookshelf of anyone who still ponders the strategy of the Vietnam War.

Parts of the book closely examine the political dynamics related to the siege of Khe Sanh. Arguments comparing Khe Sanh to Dien Bien Phu reflect the thinking of the Washington administration, the communist government in Hanoi, and military leaders from both sides. In the final chapter, authors Prados and Stubbe (who served as a chaplain at Khe Sanh during the siege) reach several conclusions that could stir anew old controversies among thinkers familiar with the political and military situations at the time.

Beyond the debates, the book fundamentally pays tribute to the 1st Battalion, 26th Marines "who were there the longest and suffered the most," while outlasting attacks by three divisions of North Vietnamese regulars. The book provides a detailed history of Khe Sanh, from its birth as a village in 1918, to its abandonment in

Lancaster Index to Defence & International Security Literature

Air Power History (along with its predecessor *Aerospace Historian*) is one of nearly 350 publications indexed and abstracted in the bibliographic database *Lancaster Index to Defence & International Security Literature*. This information is produced by Military Policy Research Ltd., of Oxford, England, and can be found at www.mpr.co.uk. It contained over 90,000 citations and abstracts as of the end of May 2002, and is increasing at the rate of around 10,000 per year.

The *Lancaster Index* database is primarily designed for information professionals in the defense and security sector, and can appear somewhat daunting to the casual visitor. A look at the User Guide, downloadable from the site, is recommended. Free access, using the global index, scans the whole database, but returns literature citations that exclude the volume, issue, and page references. Researchers who need these references for serious research purposes will need to take out a paid subscription. Individual rates range from \$9.95 for a 24-hour pass to \$99.95 for a 365-day pass.

Military Policy Research Ltd.

1968. The authors supplemented printed source material with interviews, oral histories, correspondence, and taped interviews to produce a book that gives both command- and foxhole-level views of a pivotal and bloody part of the Vietnam War.

Lt. Col. Henry Zeybel, USAF (Ret.), Austin, Texas



Airpower Advantage: Planning the Gulf War Air Campaign, 1989-1991. By Diane T. Putney. Washington D.C.: Air Force History and Museums Program, 2004. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Appendices. Glossary. Bibliography. Index. Pp. xii, 481. Paperback

While I was growing up, we had at home Clausewitz and Mahan as well as the fictional works of Scott, Marryat, Henty, and Dumas, so I have high expectations for historical narrative. This is one of the finest examples of military history I've read in the past seventy-five years. This is not for the casual reader looking for a popular story. It is a dense, detailed account of the planning of a particular, fairly short operation. It will appeal most to those with a serious interest in air planning, and then (not necessarily in order) those interested in air power in general, Gulf War I, military history, and the planning process.

Dr. Putney is eminently qualified for this project. She spent almost ten years of unrequited toil in the minefields of Air Force history officialdom before this work was published. She has drawn heavily on archival documentation and interviews with USAF planners to give a behind-the-scenes account of the evolution of the planning process for this war. She doesn't gloss over the mistakes and shortfalls in such things as the availability and dissemination of imagery and the effectiveness of bomb damage assessment. There were growing pains, and some things actually got worse as bureaucracy reasserted itself.

There is brief, but adequate, biographical information about some of the key players. Col. John Warden gets the attention he richly deserves. While Col. John Boyd wasn't there in person, he certainly was in spirit and should have been given credit. We still don't know if the outbursts of "Stormin' Norman" [Schwarzkopf] were for effect or showed some inner insecurity. Obviously, they were unprofessional. More light is cast on the relief of USAF Chief of Staff Michael Dugan. I wondered then, and still do, why what he did was considered so heinous as to call for such a drastic action. Our history is replete with examples that bear comparison. In our Revolution, the loss of Ticonderoga led to Congress replacing Schuyler with Gates. On the other hand, Benjamin Lincoln was not censured for surrendering 5,000 troops at Charleston. In the Civil War,

President Lincoln removed generals for losing battles or having the "slows" and not engaging in battle in his search for a commander. During my own service, I was close to where three different corps commanders during World War II were replaced and always wondered how much blame was entirely theirs and how much should have been shared. The circumstances of MacArthur's recall are too well known to require repetition.

The development of the plan for the air campaign is covered in 305 pages, divided into 10 logical chapters, but we're not left wondering about results. The plan was implemented; and the war was won! So, there's an epilogue of 24 pages covering the execution of the plan. The 36 illustrations scattered throughout the book show 54 individuals (with some repeats) and some important equipment, which adds a graphic touch to the narrative. At the risk of sounding ungrateful after this wealth of portraiture, there are two observations: some important figures are still missing, and it is a convenience to the reader if a picture can be shown near where the player entered the stage. There are also tables and charts which are useful. For a reader who doesn't deal with the alphabet soup of abbreviations and acronyms frequently, the glossary was indispensable. All notes are at the end of the book but have the useful device of showing the page numbers to which they pertain. They cover not only sources but some elaboration of the text, so they can't be ignored.

Keeping in mind that this is a very comprehensive but still very narrow slice of a significant period, it is recommended for those with an interest in such things. It meets the highest standards of military history and is worth the reader's investment of time.

Brig. Gen. Curtis H. O'Sullivan, USA (Ret.), Salida, California



Making War, Thinking History: Munich, Vietnam, and Presidential Uses of Force from Korea to Kosovo. By Jeffrey Record. Annapolis Md.: Naval Institute Press, 2002. Notes. Bibliography. Index. Pp. 201. \$28.95 ISBN 1-55750-009-6

Dr. Record, a writer with extensive Capitol Hill and academic experience and affiliation with the military, had three objectives for this book: (1) identify and assess policy lessons the national political-military leadership has drawn from Munich and Vietnam, (2) trace the influence of those lessons in selected instances of use of force since 1945, and (3) assess the usefulness of the Munich and Vietnam analogies and, more generally, the value of reasoning by historical analogy. He pursues these essentially by following a timeline that moves from

Truman to George W. Bush (prior to Gulf II) and highlighting where Munich and Vietnam were or were not apparent decision-making factors.

Record makes the important point that none of America's wars since 1945 were wars of necessity but, rather, wars of choice. Each time a president chose to use or not use military force, he felt it prudent to convince the American public that his decision was predicated on compelling reasons. The book abounds with examples where the choice was not transparently necessary and therefore required packaging in terminology that greatly simplified for public consumption the reasoning behind the decision. Consequently, use of the Munich and Vietnam analogies has been intended to compress a complicated decision-making process into compact and easy-to-digest icons.

The Munich icon is the more dependable of the two. It says in very simplistic terms that the President must act if we are not to repeat history. In contrast, the analogous use of Vietnam is difficult at best—as the author amply demonstrates—simply because there is no consensus on exactly what the lessons of that war are. Yet, the Vietnam experience is continually cited by Presidents, military leaders, members of Congress, and others in what are often diametrically opposed arguments. Ironically, the icon frequently works and often provokes a reaction that may not stand up to logical analysis but resonates, just the same, for many, if for different reasons. Decision-makers often embrace the Weinberger-Powell Doctrine as a logical tool for avoiding a future "Vietnam quagmire." Record, however, views the doctrine as often irrelevant to the post-Cold War world. Others maintain that involvement in Vietnam reflected a complete failure in moral leadership and was contrary to US ideals. The same perspectives have surfaced in challenges to use of force in subsequent conflicts.

Whether Presidents decide to act based on analogies such as Munich and Vietnam or use them only as devices to condense complicated reasoning into easy-to-grasp imagery is a difficult question that is not conclusively answered. Record can only cite the many occasions when Munich or Vietnam has been invoked and then states that "policy makers will continue to be influenced by past events. In analyzing a specific presidential use-of-force decision it is virtually impossible to determine the exact influence of reasoning by historical analogy without consideration of other factors." Elsewhere he says that "historical events do not repeat themselves with exactitude." In other instances, Record shows where policy makers such as Secretary of State Madeline Albright have taken issue with overuse of an icon.

Record raises other issues that may tangentially tie to effective use of force but would be better addressed elsewhere: force protection as often practiced by the U.S. military, exaggerated concerns about mission

creep, the demands for an "exit strategy," and "casualty phobia." He also speaks repeatedly to NSC-68's militarization of George Kennan's Containment [of communism] Policy. Record sees a direct path from NSC-68 to the Vietnam fiasco. He also speaks for several pages about China as potentially a future adversary.

Record's final point concerns the value of reasoning by historical analogy. He concludes that the Vietnam and Munich analogies teach effectively at the level of generality but are insensitive to differences in detail. This observation leads to two important points: (1) history does repeat itself, but not exactly, and (2) history is replete with analogies that, if selectively used, will support nearly any argument. The danger is that an audience may be ignorant of the details and simply rallies to the imagery. Perhaps the Swedish group Abba captured the mass perception best in their song, *Waterloo*: "The history book on the shelf is always repeating itself."

Col. John L. Cirafici, USAF



My B-29 Story: A Top Gunner's World War II Experiences. By Roger Sandstedt. St. Louis: Roger L. Sandstedt, 2003. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Appendices. Pp. viii, 641. \$50.00 paperback.


This book proves that more of the millions of enlisted men from World War II should have written, or should be writing books covering their experiences. Readers often don't get the G.I.'s perspective; it is usually the officers who write the books.

As one of the caretakers of the *Enola Gay* at the Smithsonian, I am interested in any B-29 material. Sandstedt takes the story of this marvelous weapon system into areas I've never read about anywhere else. Wilbur Morrison's several books about the Twentieth Air Force cover the same period Sandstedt does—essentially the entire history of the B-29, from initial training through V-J Day. But Morrison tells the story from the officer's perspective; Sandstedt's view is quite different. We must remember that more than half of the crew members were enlisted.

The author starts with a brief but

extremely interesting early biography. Sandstedt was a member of the Civilian Conservation Corps for six months before enlisting in the Air Corps. Reporting to active duty in early 1943, he was sent to basic training and then to armament school to train for an aircraft that would change the course of the war in the Pacific. Sandstedt's storytelling ability is excellent throughout. One doesn't often hear much about KP, and G.I. parties, and barracks chief duties. But that is part of the life of the enlisted member, and it is all covered wonderfully in this book.

Sandstedt soon became a certified B-29 Central Fire Control gunner—the guy who rode in the upper gun station and was essentially in charge of the gunnery system on the Superfortress. He well describes the many problems encountered in early training as the USAAF worked desperately to get the B-29 into combat. By November, 1944, he was a member of a replacement crew headed for the initial B-29 operating area in India and China. He vividly describes the flight overseas, areas they flew through, and the crew's early combat as part of the 792d Bombardment Squadron, 458th Bomb Group. But



AIR POWER

New books from Texas A&M

100 YEARS OF AIR POWER AND AVIATION

ROBIN HIGHAM
 Higham presents a critical history of British, American, Soviet, German, Italian, French, Japanese, and Israeli air power and aviation. In the process, he uncovers the social, economic, and political components; the lessons learned during wartime; the composition of air forces; and the creation of aviation industries. "Students of all levels—begin or continue your exploration here."—Stephen L. McFarland. 8 1/2x11. 480 pp. 398 b&w photos. \$50.00

THE BIRD IS ON THE WING

Aerodynamics and the Progress of the American Airplane
JAMES R. HANSEN
 Hansen presents an easily understandable overview of the research and design processes that gave rise to historic American aircraft such as the DC-3, X-1, and 747. 54 b&w photos. 240 pp. \$50.00 cloth; \$24.95 paper

TEXAS A&M UNIVERSITY PRESS

College Station, Texas
 Orders: 800-826-8911
 Fax: 888-617-2421
www.tamu.edu/upress

Illustration courtesy NASA

Sandstedt covers details of other crews and their experiences as well. Attacks against targets such as Bangkok and Singapore resulted in a number of B-29 losses. He, himself, was severely wounded on a mission over Singapore in February 1945. One of the interesting stories he covers is the escape and evasion of a crew through the Malay area with the help of Communist guerrillas.

Eventually, the entire Combat Wing departed for its new base at West Tinian Field in the Marianas and was soon back in combat on the long over-water route to the Japanese home islands. Sandstedt's crew made several emergency landings at Iwo Jima and endured the very long combat missions that crews made about every three days. His crew's last mission was on August 14, 1945, as the war finally ended.

Sandstedt has loaded his work with photos, diagrams of the B-29 and its gun system, wartime newspapers, technical manual extracts, mission reports, official documentation, and the like. The photo quality is not always great, but it is adequate to get the messages across.

To obtain a copy of this self-published book, readers must contact the author at 147 Ameren Way, Baldwin, MO 63021 or e-mail to r.l.sandstedt@att.net. Why no publisher would pick up this work is utterly beyond me. It's easy to read and, in my view, one of the finest first-person stories of the war I have read.

Col. Scott A. Willey, USAF (Ret.), NASM
Docent and Volunteer



Afterburner: Naval Aviators and the Vietnam War. By John D. Sherwood. New York: New York University Press, 2004. Photographs. Notes. Glossary. Bibliography. Index. Pp x, 353. \$32.95 ISBN: 0-8147-9842-x

John Sherwood has penned another outstanding, well-written, and valuable study of military aviation. It joins his well-received and excellent *Officers in Flight Suits* (1996) that told of USAF fighter pilots in the Korean War and *Fast Movers* (1999) that focused on jet pilots in Vietnam. *Afterburner* concentrates on twenty-one naval aviators (to include Marines) who flew and fought in the Vietnam War after the 1968 bombing halt into the operations of 1972. Sherwood uses a social history approach to focus on a few individuals with considerable detail. Based primarily on extensive interviews, it does not neglect archival or secondary sources.

Perhaps the most prominent aspect of this account is its candor, for Sherwood is unsparing of the military and of individuals. *Afterburner* relates specific instances of questionable conduct, names names, and pulls no punches. The author writes that

"Some [individuals] performed exemplary service and stand out as role models; others made grave errors." Another noteworthy feature is the author's sympathetic and extensive treatment of the non-pilot fliers, Naval Flight Officers (NFO), also known as the "guys in back" (GIB). While these men have gotten scant mention from writers of the conflict, Sherwood shows their importance and how they frequently were poorly treated by both the military and pilots. He goes on to discuss and criticize the fighter pilot mentality. This is a broad study, covering air-to-air exploits (which certainly have received considerable attention) as well as attack operations including the mining of North Vietnamese waters (which have not). Sherwood gives considerable detail about each individual: his background (especially why he entered the military); how he got into aviation; why he volunteered for flying duty over Vietnam; and, of course, his war service. He points out the differences between Air Force and carrier operations and how and why the naval aviators did better in the air-to-air battle (overall, the Navy posted a 4.1:1 victory-to-loss ratio in aerial combat contrasted with the Air Force's 2.2:1). In all it makes for lively, vivid, and informative reading. *Afterburner* certainly will appeal to the general reader as well as to more informed and demanding readers for, in addition to its popular appeal (an interesting story, well told), it includes details and new information backed by substantial end-notes and a solid bibliography.

While the author succeeds extremely well in his purpose, some may fault his effort. First, there will be criticism of this genre—social history. There is insufficient space to debate that issue here, but suffice it to say that this is the microview of history. Those who prefer a chronological or comprehensive treatment with analysis, or a study that shows the big picture will be disappointed. In fairness, Sherwood does a fine job explaining many of the significant aspects of the air war such as the various aircraft (US and communist), tactics, munitions and those details that only a few other studies have covered. He gives a good overview of the air war, but this is not a history of naval aviation in the Vietnam War as much as an episodic view of how that battle was seen, lived, and fought by these naval aviators. Another possible criticism is that material was recycled from his previous book, *Fast Movers*. Finally, some may object to Sherwood's extensive treatment of the prisoner-of-war experience (forty-five pages) and may suggest that this would be better handled in a separate study.

How does this stack up? I highly recommend *Afterburner* with only the caveat concerning social history: some may not like this type of book. Personally I would include it along with *Fast Movers* on my list of the top ten books on the air war in Vietnam. Both provide new material; a valuable bal-

ance and supplement to the more traditional efforts; and, most of all, a fresh view. Well done!

Dr. Kenneth P. Werrell, Christiansburg,
Virginia



A Question of Loyalty: Gen Billy Mitchell and the Court-Martial that Gripped the Nation. By Douglas Waller. New York: Harper Collins, 2004. Photographs. Notes. Appendices. Bibliography. Index. Pp. 439. \$26.95 ISBN 0-06-050547-8

Through an analysis of General Billy Mitchell's 1925 court martial, *Time* magazine writer Douglas Waller has examined Mitchell's role in developing American air power. Waller flashes back from 1925 to highlight Mitchell's privileged childhood as the son of a U.S. Senator, his Army enlistment during the Spanish American War, and successful early military career as a signal officer. But aviation, Mitchell's passion from 1915 (as a major serving a coveted General Staff tour, Mitchell paid \$1,470 for his own flying lessons), ensured both his greatest success and his eventual downfall. Waller pulls no punches in telling of the headstrong Mitchell's insistence on "first billing" among U.S. World War I air leaders. Regarding the 1921 sinking of the captured German battleship *Ostfriesland* by Mitchell's Army bombers, Waller accurately relates Mitchell's disregard of the agreed rules but reminds the reader that the Navy was not enthusiastic about the test and did nothing to help Mitchell make his case.

While Waller captures the legal ebb and flow of the court martial, he leaves no doubt that Mitchell's choice of public words, timing, and audiences would lead to his downfall. Even the general's most loyal friends and colleagues (particularly Maj. "Hap" Arnold) acknowledged that he left the War Department with little choice but to bring and prove charges against him. Mitchell's own public charges against the War Department, the Navy Department (following the loss of the dirigible *Shenandoah* and its commanding officer, Cdr. Zachary Landsdowne), and by extension the President, were clearly beyond any modern era's standards of behavior for a military officer. Mitchell was convinced that the nation would rally to his charges against an anti-aviation bureaucracy; however, public support did not protect him from conviction and the end of his stormy Army career.

Unlike other authors on the subject, Waller has personalized the members of the court, most of whom were far senior to Mitchell and had distinguished careers in their own right. No doubt there was some official predisposition to convict Mitchell (some original court members were removed by challenge), but most of the members are presented as free of inappro-

prate influence and, ironically, personally friendly with Mitchell (Gen. Frank McCoy was a pallbearer at Mitchell's 1936 funeral, as was another friend who had his own problems with Army leadership, then-Col. George C. Marshall).

Waller is writing to the general public, and so spends much time on the trial's era, Mitchell's personal life and finances, and on his interactions with such public figures as Will Rogers (Mitchell had taken Rogers for his first airplane ride, and the beloved comedian attended the trial—clearly a celebrity guest). He may confuse some readers by referring to Robert Olds, Mitchell's aide and an air visionary in his own right, by the older spelling of his name, "Oldys." But on balance, this accessible book will explain much of the reason for Mitchell's still-contentious reputation and may motivate readers to do more research into both Mitchell and the exceptional group of younger officers who supported him and were able to bring his airpower vision to fruition a generation later.

*Lt. Col. Joseph R. Davis, USAF (Ret.),
Docent, NASM's Uduar-Hazy Center*



The title has a currency in present events. We see the dilemma of deciding when personal belief and conviction can override the policy of an institution to which we have sworn to bear full faith and allegiance. It is left to the reader to decide whether the self-inflicted martyrdom of Billy Mitchell helped or hindered his cause—the increased autonomy, leading to independence of the Air Service with the implied corollary of an overseeing military establishment or department of defense. There is little question that the intemperate tone of his press release about the *Shenandoah* disaster (which led to his court martial) helped perpetuate the image of willful, ill-disciplined fly boys. At the time, his poor judgment was variously attributed to a recent bump on his head, the absence of his wife's restraining influence, even more than his usual consumption of Scotch, or a death wish (he had a poor heart).

The subtitle of the book features the trial, but the work is actually an entire biography—and a good one. It is organized a little differently. About 226 of the pages (and 21 of the 28 chapters) cover the court martial, but the story is broken by events back in the 1918, back to 1903, the trial, 1918 again, the trial, etc. This out-of-sequence arrangement may serve a dramatic or literary purpose but does make it difficult to keep track of Billy's wives and some other points.

In his "acknowledgements," the author attempts to forestall the inevitable question of why another Mitchell book. Common reasons are declassified material, newly found substantive information, or a different perspective. Waller has new personal and offi-

cial documents which he feels reveal Mitchell's innermost thoughts and secret motivation. He has extensive source notes and a modest selected bibliography which apparently back up his conclusions.

America has always sought heroes to worship and has found them in the fields of sports, entertainment, and politics. The military produces particularly heroic figures: Washington didn't win many battles but won the war; Jackson's victory came after the peace was signed at Ghent; Scott occupied the enemy's capital; Grant accepted the surrender of another icon at Appomattox; Dewey sank a Spanish fleet in 1898; Pershing led the AEF; Ike had a dull ceremony at Reims; and MacArthur has a better staged show on the *Missouri*. Things have been less decisive in later conflicts. It is difficult to see where Mitchell fits into this galaxy. He significantly contributed to the development of military air in World War I, but it wasn't a one-man show. Mason Patrick was more important, and George Squier and Benny Foulois were on a par. Hap Arnold should be included as director of training in the States. The public knew more about the Lafayette Escadrille and individual aces such as Lufberry, Luke, and Rickenbacker. Billy early acquired a reputation for being opinionated, close to insubordination, and not much of a team player. He was, however, a visionary with a group of dedicated disciples. Who can tell how much his dreams influenced what those who went on to high positions in World War II implemented.

The book is well written and readable, as might be expected from a *Time* magazine senior correspondent who has produced five previous works. I found much new information: some useful, some merely entertaining, and more than I really wanted on the details of the trial. Waller states he received countless answers on courts-martial matters from the National Institute of Military Justice, but he may not have asked the right questions. He has the words but not the music of how the Articles of War worked and served mission accomplishment since John Adams had cribbed them from the British when he headed the Board of War during the Revolution. Perhaps it requires experience with the three levels of courts (summary, special, and general) to fully understand how the system worked before the introduction of the Uniform Code of Military Justice in 1950.

Overall, however, the book is worth the investment of time and modest price.

*Brig. Gen. Curtis H. O'Sullivan, USA (Ret.),
Salida, California.*



Echoes of Eagles: A Son's Search for His Father and the Legacy of America's First Fighter Pilots. By Charles Wooley with Bill Crawford. New York: Dutton, 2003. Maps. Diagrams. Photographs. Appendices.

Glossary. Bibliography. Index. Pp. 307. \$24.95 ISBN: 0-525-94757-4

A book with this sort of subtitle had all the potential to be one of those soppy, wasn't-my-father-a-wonderful-man tales one sometimes finds. Instead, what Charles Wooley offers the reader is a well-written book that not only provides a biography of his father, Charles Hildreth Wooley, but also is one of the finest accounts I've read of the American Expeditionary Force's fledgling air arm in World War I France.

Wooley has written a number of other books, several of which deal with air combat in World War I. His intent with this book was certainly not to write the definitive history of the Air Service during the Great War. Rather, he tells the story of his father from his enlistment in the American Field Service (ambulance corps) through the Armistice of November 1918. This automatically limits the scope primarily to two pursuit squadrons. But in the process, the reader is treated to a marvelous description of what life was like for the many pilots who started their service driving ambulances and then proceeded through the flying schools in France to serve as combat pilots. Training, life and death at the front, operations and off-duty activities, and some of the famous and not-so-famous personalities involved: all are covered in this highly-readable narrative.

Wooley's story is really a compilation of forty years of research, a large part of which involved personal contact with many of the pilots who visited his dad's home in the years after the war. Diaries, letters, photo albums, and visits with aging veterans served to round out the story of who these men were and what they did. Through these, the reader gets to know Lufberry, Rickenbacker, Meissner, Sewall, Quentin Roosevelt, and many of the names associated with early American air combat.

Lieutenant Wooley was somewhat typical of these men. He was one of many reasonably well-to-do individuals who came from the Ivy League colleges and prep schools to serve in Europe. His entry into the continent was through the American Field Service where he brought French troops back from the front and saw the carnage of the stalemated war first hand. With America's entry into the war, he knew what he wanted to do was fly. He trained at the French flying school at Tours then at the newly constructed American flying school at Issoudun. Assigned to the 95th Aero Squadron, Wooley headed to the front in February 1918. Delays in receiving aircraft kept the real action from starting until May. But then these men entered combat against some of the best aviators in the German Imperial Flying Service—and they more than held their own as they honed their skills and fought not only the Germans but also jamming guns, failing engines, and other faults of these early fighters.

At about the time the U.S. Army assumed control of its own section the front lines, Wooley was reassigned as a flight commander in the newly formed 49th Aero Squadron. He ended the war with two confirmed and several unconfirmed kills.

For a great story about what it was like to be one of America's first fighter pilots, this is the book to buy.

Col. Scott A. Willey, USAF (Ret.), NASM Docent and Volunteer



American Military Aviation: The Indispensable Arm. By Charles J. Gross. College Station: Texas A&M Press, 2002. Photographs. Illustrations. Notes. Bibliography. Index. Pp. xv, 375. \$35.00 ISBN 1-58544-215-1.

Charles Gross, chief of the Air National Guard history program, offers a survey of the past one hundred years of American military aviation. In that regard, this volume fits well within the aims and scope of the well-received Centennial of Flight series from Texas A&M Press edited by Roger Launius (Gross's volume is number two). This book is an ideal source for undergraduate history courses dedicated to aerospace and military topics, ROTC curricula, and especially for advanced training for military officers. As the only up-to-date single-volume text on American military aviation, Gross fills a significant gap in the literature of aerospace history.

Gross makes five overarching conclusions about the history of American military aviation:

1. Aviation is indispensable to American military force and diplomacy where it plays

a dominant, leading role to ground and sea forces.

2. Political and military leaders consistently overestimate the potential of military aviation by itself to solve national security problems. The successful use of military aviation in conjunction with armies and navies overshadows the belief, real and/or perceived, that air power made all other ways of war obsolete. These two theses suggest that rather than existing as the "indispensable arm," military aviation is an "integrated arm" within the modern American defense establishment. Whether it is dominant or "indispensable" depends on the actual conditions of individual operations.

3. Two important elements of military aviation, airlift and aerial refueling, traditionally the "neglected stepchildren of air power," have been the key to the global reach of the American military since World War II. Basically, the not-so-glamorous utilitarian segment of American military aviation provided the flexibility and infrastructure needed for the success of air power.

4. Military aviation and the resultant growing threat of world annihilation it created transformed warfare by extending the range and scope of destruction for both soldiers and civilians.

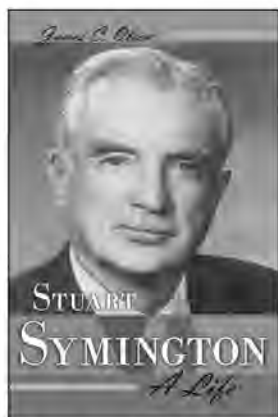
5. Aviation has impacted U.S. culture and economy where wars, both cold and hot, have been responsible for aviation's most intense periods of growth.

Seven chronological chapters tell the story of American military aviation and illustrate Gross's five major conclusions. He begins by discussing the creation of the airplane and the first forays in to the air by American military aviators in the early flight and World War I eras. Gross describes the interwar period as a "golden age of inno-

vation" where American military aviation underwent a dramatic, and peaceful, transformation in technology, doctrine, and organization, which appears to contradict his fifth over-arching conclusion above. World War II was an "aerial Armageddon" where Gross stresses that tactical air power, not strategic bombing, contributed more to the overall Allied victory. The postwar period witnessed dramatic developments in American military aviation including the Korean and Vietnam conflicts, the expression of political goals for peaceful means as seen in the 1948 Berlin Airlift, and the cautious, integrated use of air power in recent campaigns in the Balkans and the Middle East.

Overall, Gross's one-volume synthesis of American military aviation masterfully brings together current interpretations of the topic, which reflects his overwhelming reliance on secondary sources and broader trends in military history. Readers should be aware that many of the historiographical debates he addresses can and will be vigorously debated for years to come in such a young field. A way Gross could make the book more accessible to less advanced readers would be to include a basic definition and index entry of the oft-used, oft-misunderstood, and politically-charged term "air power," a phrase he uses interchangeably with "military aviation." Keeping those limitations in mind, this book will certainly serve as a point of departure for more in-depth research by students of the topic.

Jeremy R. Kinney, Ph.D., Curator, Aeronautics Division, Smithsonian National Air and Space Museum



Stuart Symington A Life

James C. Olson

Stuart Symington is the first full-length biography of one of Missouri's most influential and effective twentieth-century political leaders. Known as "Harry Truman's Trouble Shooter," Stuart Symington was unanimously confirmed by the Senate for six major presidential appointments—a record. As assistant secretary of war for air, he represented the War Department in negotiations leading to the National Security Act of 1947, which unified the armed services into a single national military establishment under the secretary of

defense. During his tenure as secretary of the air force, he steered that organization through a series of crises, including racial integration, as it developed into an independent entity within the Defense Department. 560 pages, 40 illustrations, \$39.95

"Stuart Symington's story is as fascinating as it is complicated, and James C. Olson tackles the Herculean task of sorting it all out. This well-crafted book provides the first comprehensive portrait of Symington and his multifaceted career. The writing is clear and to the point. The research is impressive. Olson's access to personal papers still in the hands of the family afforded him valuable insights about Symington and his actions. *Stuart Symington: A Life* is a fascinating read."—William E. Foley

Books Received

Bogle, Lori Lyn. *The Pentagon's Battle for the American Mind: The Early Cold War*. College Station: Texas A&M University Press, 2004. Illustrations. Photographs. Notes. Bibliography. Index. Pp. xxii, 220. \$34.00 ISBN: 1-58544-378-6

* Calderara, Lodvico and Attilo Marchetti. *Mario Calderara: Aviator and Inventor, the First Italian Pilot of Wilbur Wright*. Firenze, Italy: LoGisma editore, 2003. [First published in 199 in Italian.] Illustrations. Photographs. Bibliography. Appendix. Pp. 303. 15 Euros Paperback ISBN: 88-87621-41-1

Courtwright, David T. *Sky as Frontier: Adventure, Aviation, and Empire*. College Station: Texas A&M University Press, 2004. Illustrations. Photographs. Notes. Glossary. Index. Pp. x, 284. \$24.95 Paperback ISBN: 1-58544-419-7

Graham, Thomas, Jr. *Commonsense on Weapons of Mass Destruction*. Seattle and London: University of Washington Press, 2004. Appendices. Glossary. Index. Pp. x, 206 \$12.95 Paperback ISBN: 0-295-98466-X

Helfrick, Albert. *Electronics in the Evolution of Flight*. College Station: Texas A&M University Press, 2004. Illustrations. Glossary. Index. Pp. x, 190. \$19.95 Paperback ISBN: 1-58544-413-8

Kennedy, Betty. *Globemaster III: Acquiring the C-17*. Scott AFB, Ill.: Air Mobility Command, Office of History, 2004. Photographs. Notes. Appendices. Glossary. Index. Pp. xv, 298.

Levis, Alexander H. *The Limitless Sky: Air Force Science and Technology Contributions to the Nation*. Washington, D.C.: Air Force History and Museums Program, 2004. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Appendices. Glossary. Bibliography. Index. Pp. 265 Paperback

Marrett, George J. *Howard Hughes: Aviator*. Annapolis, Md.: Naval Institute Press, 2004. Photographs. Index. Pp. xi, 257. \$27.95 ISBN: 1-59114-510-4

Maslowski, Peter and Don Winslow. *Staff Sergeant Joe Ronnie Hooper and the Vietnam War*. Lincoln and London: University of Nebraska Press, 2004. Maps. Photographs. Notes. Appendices. Glossary. Bibliography. Index. Pp. 618. \$29.95 ISBN: 0-8032-3244-6

Parker, Geoffrey. *The Army of Flanders and the Spanish Road, 1567-1659: The Logistics of Spanish Victory and Defeat in the Low Countries' Wars*. New York: Cambridge University Press, 1972 [second edition]. Maps. Tables. Diagrams. Illustrations. Photographs. Notes. Appendices. Glossary. Bibliography. Index. Pp. xxix, 219. \$29.99 Paperback ISBN: 0-521-54392-4

Perry, James M. *Touched with Fire: Five Presidents and the Civil War Battles That Made Them*. New York: Public Affairs, 2002. Maps. Photographs. Bibliography. Index. Pp. xvi, 335. \$16.00 Paperback ISBN: 1-58648-290-4.

Rabasa, Angel M. et al. *The Muslim World after 9/11*. Santa Monica, Calif.: RAND Corp., 2004. Tables. Diagrams. Illustrations. Notes. Appendices. Glossary. Bibliography. Index. Pp. xxxix, 525. \$40.00 Paperback ISBN: 0-8330-3534-7

Ralph, Barry. *Savage Wilderness: The epic outback search for the crew of Little Eva - The ultimate World War II survivor story*. St. Lucia, Queensland: University of Queensland Press, 2004. Maps. Illustrations. Photographs. Sources. Index. Pp. xii, 209. \$32.95 Paperback ISBN: 0-7022-3443-5

PROSPECTIVE REVIEWERS

Anyone who believes he or she is qualified to substantively assess one of the new books listed above is invited to apply for a gratis copy of the book. The prospective reviewer should contact:

Col. Scott A. Willey, USAF (Ret.)
3704 Brices Ford Ct.
Fairfax, VA 22033
Tel. (703) 620-4139
e-mail: scottwille@aol.com

* Already under review.

Rees, Laurence. *Auschwitz: A New History*. New York: Public Affairs, 2005. Notes. Photographs. Index. Pp. xxii, 327. \$30.00 ISBN: 1-58648-303-X.

Rice, Ronald R. *The Politics of Air Power: From Confrontation to Cooperation in Army Aviation Civil-Military Relations*. Lincoln: University of Nebraska Press, 2004. Notes. Bibliography. Index. Pp. xxiii, 283. \$49.95 ISBN: 0-8032-3960-2

Soros, George. *The Bubble of American Supremacy: The Costs of Bush's War in Iraq*. New York: Public Affairs, 2004. Appendix. Index. Pp. xiii, 207. \$13.00 Paperback ISBN: 1-58648-292-0

* Van Riper, A. Bowdoin. *Rockets and Missiles: The Life Story of a Technology*. Westport, Ct. and London: Greenwood Press, 2004. Illustrations. Photographs. Glossary. Index. Pp. xvi, 176. \$45.00 ISBN: 0-313-32795-5



U.S. AIR FORCE

Air Force History and Museums Program Job Openings

Over the next three years, the United States Air Force will hire numerous new civilian historians. Most of these positions are located at Air Force bases worldwide, where historians write the official history of the organizations to which they are assigned. Air Force historians also answer public and governmental inquiries, prepare analytical studies, develop heritage and outreach programs, and support the Air Force museum and art programs. Historians who fill these positions can expect to deploy overseas during military operations. Salary range: \$48,000 minimum, depending on location and qualifications. The Air Force History and Museums Program is an Equal Opportunity employer and strongly encourages women and minorities to apply.

For more information on current openings and how to apply, contact Ms. Cheryl Gumm by telephone 210-565-4508 or email HMCCP@randolph.af.mil.

History of Rocketry and Astronautics

Donald C. Elder and Christophe Rothmund, Editors



AAS History Series, Volume 23

IAA History Symposia, Volume 15



HISTORY OF ROCKETRY AND ASTRONAUTICS BOOK SERIES

American Astronautical Society History Series

For a complete listing of these excellent volumes on the history of rocketry and astronautics, including brief descriptions of each volume, tables of contents of most of the volumes and ordering information, please visit the following pages in the book sections of our Web Site:

1. [http://www.univelt.com/
Aasweb.html#AAS_HISTORY_SERIES](http://www.univelt.com/Aasweb.html#AAS_HISTORY_SERIES)
2. [http://www.univelt.com/
Aasweb.html#IAA_PROCEEDINGS_
HISTORY_ASTRONAUTICS_SYMPOSIA](http://www.univelt.com/Aasweb.html#IAA_PROCEEDINGS_HISTORY_ASTRONAUTICS_SYMPOSIA)
3. <http://www.univelt.com/htmlHS/noniaaahs.htm>

If you would like for us to send you more information, then please contact us as follows:

**Univelt, Inc., P.O. Box 28130,
San Diego, CA 92198, USA
Tel.: (760) 746-4005; Fax.: (760) 746-3139
E-mail: 76121.1532@compuserve.com**

Web Site: <http://www.univelt.com>

Coming Up



Compiled by George Cully

March 5-6

The Brown University graduate community, in association with the Committee on Science & Technology Studies, will host the **23rd Annual Mephistos Conference on the History, Philosophy, and Sociology of Science, Technology and Medicine**. Contact:

Tanya Sheehan, Chair
2005 Mephistos Organizing Committee
e-mail: mephistos@brown.edu
website: <http://www.brown.edu/Students/Mephistos>

March 15

The **Military Classics Seminar** meets for dinner-discussion at the Ft. Myer, Virginia, Officers' Club. This month's selection is Julius Caesar, *The Battle for Gaul*. Trans. By Anne and Peter Wiseman. London: Chatto and Windus, 1980. Speaker: Diane Gordon, University of Maryland University College. Contact:

Dr. Graham Cosmas
Joint Staff Historical Office
(703) 697-3088
e-mail: cosmasga@js.pentagon.mil

March 17-19

The **Society for History in the Federal Government and Oral History in the Mid-Atlantic Region** (OHMAR) will collocate their annual meetings in the Food and Drug Administration's Wiley Building in College Park, Maryland. Contact:

SHFG 2005 Conference
Box 14139, Ben Franklin Station
Washington DC 20044
e-mail: donalps1@ucia.gov
website: <http://www.shfg.org>

March 17-19

The Vietnam Center at Texas Tech University will host its **5th Triennial Vietnam Symposium** at the Holiday Inn Park Plaza in Lubbock, Texas. Topics include the 40th anniversary of the first major commitment of US ground forces to Vietnam; the 30th anniversary of the end of the war; and the 10th anniversary of the normalization of relations between the United States and Vietnam. Contact:

James R. Reckner, Ph.D., Director
The Vietnam Center
Texas Tech University
Lubbock, TX 79409-1045
e-mail: james.reckner@ttu.edu
website: <http://www.vietnam.ttu.edu>

March 19

The Hagley Fellows at the University of Delaware will host the **2005 Hagley Fellows Conference** at the Hagley Museum, located in Wilmington, Delaware. The conference theme is entitled "The Spectacle of Technology." Contact:

Hagley Fellows,
University of Delaware
236 John Munroe Hall
Newark, Delaware 19716
e-mail: hagley.fellowsconference@gmail.com

March 29-30

The American Astronautical Society will hold its **43rd Goddard Memorial Symposium** at the Greenbelt Marriott Hotel in College Park, Maryland. Contact:

American Astronautical Society
6352 Rolling Mill Place, Suite #102
Springfield, VA 22152-2354
(703) 866-0020, Fax -3526
e-mail: info@astronautical.org
website: <http://www.astronautical.org>

March 31- April 3

The **Organization of American Historians** will hold its annual meeting at the San Francisco Hilton in San Francisco, California. This year's theme is "Telling America's Stories: Historians and Their Publics." Contact:

OAH Annual Meeting
112 North Bryan Ave.
Bloomington IN 47408-4199
(812) 855-9853
e-mail: meetings@oah.org
website: <http://www.oah.org/meetings>

April 4-7

The **Space Foundation** will host its 21st National Space Symposium at the Broadmoor Hotel in Colorado Springs, Colorado. Contact:

The Space Foundation
310 S. 14th St.
Colorado Springs, CO 80904
(719) 576-8000, Fax x8801
website: <http://www.spacefoundation.org>

April 6-7

The U. S. Naval Institute's **131st Annual Meeting and Naval History Seminar** will be held at the U.S. Naval Academy in Annapolis, Maryland. This year's theme is "Expeditionary Warfare: Past, Present, and Future." Contact:

U.S. Naval Institute
Beach Hall
291 Woods Road
Annapolis MD 21402
(410) 295-1067, Fax x1048
e-mail: frainbow@usni.org
website: <http://www.usni.org/>

April 14-15

To commemorate the 30th anniversary of the end of the Vietnam War, the **University of Newcastle's Research Group for War, Society, and Culture** will host a conference entitled, "The Vietnam War: Thirty Years On: Memories, Legacies, and Echoes.. The conference will be held at the University of Newcastle in Callaghan, NSW, Australia. Contact:

Dr. Chris Dixon
History Discipline
School of Liberal Arts
The University of Newcastle
Callaghan NSW 2308 Australia
e-mail: chris.dixon@newcastle.edu.au

April 14-17

The **National Council on Public History Annual Conference** "Defining Regional Historians and the Culture and Meaning of Region," will be held in Kansas City, Missouri. Sponsored by the Truman Presidential Museum and Library. Contact:

National Council on Public History
e-mail: ncph@iupui.edu
website: <http://www.ncph.org/news.html>

April 18

The **U.S. Navy Museum's Monthly Seminar Program** continues with a presentation by Dr Carol Reardon on the role of the Grumman A-6 Intruder all-

weather strike-bomber in the Vietnam War. For other monthly topics, contact:

Dr Edward J. Marolda, Senior Historian
Naval Historical Center
The U.S. Navy Museum
Bldg. 76, Washington Navy Yard
Tel.: (202) 433-3940
E-Mail: Edward.Marolda@navy.mil

April 19

The **Military Classics Seminar** meets for dinner-discussion at the Ft. Myer, Virginia, Officers' Club. This month's selection is Robert M. Utley, *Frontiersmen in Blue: The U.S. Army and the Indian, 1846-1865*. New York: Macmillan, 1967; and *Frontier Regulars: The U.S. Army and the Indian, 1866-1891*. New York: Macmillan, 1973. Speaker: Willy Dobak, U.S. Army Center of Military History. Contact:

Dr. Graham Cosmas
Joint Staff Historical Office
(703) 697-3088
e-mail: cosmasga@js.pentagon.mil

April 29-30

The UCSB Center for Cold War Studies (CCWS), the George Washington Cold War Group (GWCW), and the LSE Cold War Studies Centre (CWSC) will co-host the **2005 International Graduate Student Conference on the Cold War** at the University of California-Santa Barbara, in Santa Barbara, California. Contact:

George Fujii
UCSB Center for Cold War Studies (CCWS)
Department of History
University of California
Santa Barbara, 93106-9410
e-mail: gfujii@umail.ucsb.edu
website: <http://www.history.ucsb.edu/projects/ccws/conference/>

May 4-8

The **Council on America's Military Past (CAMP)** annual meeting will be held in San Diego, California. Contact:

CAMP
P.O. Box 1151
Ft. Myer, VA 22021
(703) 912-6124
e-mail: camphart1@aol.com

May 6-11

The **Army Aviation Association** will hold its annual convention at the Disney Coronado Springs Resort in Orlando, Florida. This year's theme will be "Transforming to Meet the Warfighter's Needs." Contact:

e-mail: aaaa@quad-a.org
website: <http://www.quad-a.org>

May 17

The **Military Classics Seminar** meets for dinner-discussion at the Ft. Myer, Virginia, Officers' Club. This month's selection is Allan R. Millett and Williamson Murray, Eds. *Military Innovation in the Interwar Period*. New York: Cambridge, 1996. Speaker: Brian M. Linn, Texas A & M University. Contact:

Dr. Graham Cosmas
Joint Staff Historical Office
(703) 697-3088
e-mail: cosmasga@js.pentagon.mil

May 11-12

The **National Museum of Naval Aviation** will host its annual symposium at the Museum's facilities in Pensacola, Florida. This year's focus is on Naval Aviation in Space, The Last of the Dogfighters, and the future of naval aviation. Contact:

National Museum of Naval Aviation
1750 Radford Blvd. Suite C

N.A.S. Pensacola, Florida 32508
(850) 452-3604, Fax x3296
e-mail: Naval.Museum@cnet.navy.mil
website: <http://www.naval-air.org>

May 19-21

The **Business History Conference** will host its annual meeting in Minneapolis (USA), home to the flagship campus of the University of Minnesota. The theme for the conference is "Reinvention and Renewal." Contact:

Roger Horowitz
Secretary-Treasurer
BHC
PO Box 3630
Wilmington DE 19807
(302) 658-2400, Fax 655-3188
e-mail: rh@udel.edu
website: <http://www.h-net.org/~business/bhcweb/>

May 27-29

McGill University will host its **7th Annual Conference of The Space Between: Literature and Culture, 1914-1945**, at McGill University, Montreal, Quebec, Canada. The conference will "explore the manifestations, effects, and representations of the new technologies of the 1914-1945 period," including flight and the technologies of production. Contact:

Robin Feenstra
Dept. English, Arts Bldg.
McGill University
853 Sherbrooke St W.
Montreal, Quebec H3A 2T6 Canada
e-mail: robin.feenstra@mail.mcgill.ca
website: <http://www.precursors.org>

Jun 1-3

The **American Helicopter Society** will host its 61st annual forum and technology display at the Gaylord Texan Resort in Grapevine, Texas. Contact:

AHS Int'l - the Vertical Flight Society
217 N. Washington St.
Alexandria, VA 22314-2538
Tel.: (703) 684-6777, Fax 739-9279
e-mail: kim@vtol.org
website: <http://www.vtol.org>

Jun 2-3

Siena College will host its annual symposium, **World War II-A 60-Year Perspective**, with presentations featuring the year 1945. Contact:

Dr Karl Barbir
Dept. of History
Sienna College
515 Loudon Road
Loudonville, NY 12211-1462
(518) 783-2512 - FAX 518-786-5052
e-mail: barbir@sienna.edu

If you wish to have your event listed, contact:

George W. Cully
10505 Mercado Way
Montgomery Village, MD 20886-3910
e-mail: warty@comcast.net

Letters

Taking Issue

Reference to author James S. Corum's article, "The Luftwaffe and its Allied Air Forces in World War II [*Air Power History*, Vol. 51, No. 2.] Dr. Corum states, "Germany's defeat in the air was due to the Third Reich's inability to effectively lead a coalition war." Such a profound statement would no doubt come as a surprise to Generals Spaatz, Doolittle, and LeMay, not to mention Eisenhower. It certainly comes as a surprise to me. All these years I labored under the impression that the *Luftwaffe* was defeated by superior airmanship of the British and American airmen, general superiority of equipment in numbers, devastating results of strategic bombing against oil supplies and factories, and what proved to be a catastrophic decision by Hitler about air defense and training. By the end of 1944, the *Luftwaffe* was putting young boys with a total of 112 hours flying time into the skies against Allied fighters. With all due respect, I suggest that the air forces of Romania and Italy would not have made one iota of difference in the success of the Allies in the air or on the ground. In those cases numbers have no relationship to capabilities. Postwar surveys and reports confirm this position.

*Lt. Col. C.W. "Bill" Getz, USAF (Ret.)
Burlingame, California."*

The Author Responds

If Germany had, from the start, thought in terms of coalition warfare, the outcome of several vital campaigns certainly might have been very different. If Germany had begun a program when it signed the alliance with Italy in 1938 to support the Italian armaments industry with financial help, technological assistance and licenses to build German weapons one can imagine a very different outcome to the battle for North Africa, for example. The British only established a clear margin of air superiority over the Axis in that theater in mid-1942. What if the Italians had available a force of 300-400 more Macchi 202s supported by 100-200 license-built Ju-88s in North Africa in 1941-1942? Air superiority, which was a requirement for the Allied ground success in North Africa, would have been far more difficult to obtain. In the last 18 months of the war in Europe, the overwhelming industrial production of the U.S. clearly prevailed. And only at this late date did

Germany look seriously at its allies' potential to build and employ modern German arms. But the margin of Allied superiority victory in the campaigns of 1942 and 1943 was not nearly as large as it was later. If Germany had prepared for war with the intention of building up its coalition partners' capabilities Italy could have had 2-3 times the aircraft production in 1941-42 than it had and the quality of the aircraft would have been far better. This would have made a big difference in the outcome of the campaigns in the Mediterranean and Russia.

Although I focused on Germany's failure to develop its allies' aircraft industries in my article, the same points can be made for the army equipment of German allies. Romania, Italy and Hungary had significant heavy industries that could have built superior German tanks (such as the Mark IV), assault guns and artillery pieces for the Wehrmacht and their own armies. Instead, Germany's allied forces in the East were well-led and trained — but poorly equipped and thus became a liability for the Germans rather than an asset. In 1942 the Russians were able to counterattack and break the German line at several decisive points because their forces (with superior weapons) were able to break through the poorly-equipped Italian and Romanian armies. If the Romanians and Italians had possessed a full complement of German armor and weapons (built under license) could the Russians have broken their forces so easily in 1942 and 1943? I doubt it.

You mention the U.S. campaign against the Axis oil with providing "devastating results." The U.S. bombing campaign against the Axis' most important oil center, Ploesti, was one of the toughest and bloodiest air battles of the war. If the Romanians had possessed a force of 200-300 additional license-built Me-109s and FW 190s for the defense of Ploesti in 1943-early 1944 would the campaign against German oil have been nearly as successful? Again, I doubt it. In this case, a well-equipped Romanian Air Force might have made a lot of difference in the air war. On several occasions between 1942-early 1944 the success of the U.S. and UK bombing campaign was a near run thing and the addition of a few hundred more Axis planes and pilots at certain times and places could have made a huge difference in the outcome.

In the article I contrasted the Allied approach to coalition war, in which the Americans played the central role in supplying, supporting, equipping, training and financing its allied partners. The American/British approach to coalition

warfare as a partnership that included sharing the latest technologies and coordinating industrial production played a decisive role in winning the Allied victory. The Germans crippled themselves on the ground and in the air first by a short war mentality that put off full mobilization until too late and by then by failing to establish an effective coalition that could efficiently exploit the very considerable economic and military potential of their partners. It comes down to economics and the Allied margin of superiority in this field was huge. But, as I point out in the article, that margin might have been very much smaller (especially in the early part of the war) if Germany had appreciated and understood the nature of effective coalition warfare.

I disagree with Col. Getz in his assessment of the Italians and Romanians. As I have suggested, their air (and ground) forces could have made a major difference in the outcome of important campaigns if they had been adequately equipped. For the Allies, coalition partners such as Canada, Australia, and the Free French played a significant role in several campaigns. The Allied coalition also saw to it that these forces were superbly equipped and, because of that, were effective on the battlefield. A big part of the Allied margin of superiority in the strategic bombing offensive came from the large number of Canadian aircrew in the RAF and 3,000 Lancaster bombers produced in Canada. I know that the record of the Italian, Romanian and Hungarian forces in World War II was mediocre. However, I know of no Allied postwar studies that ever suggested that Italian, Romanian and Hungarian war making potential was minimal or irrelevant, or that these nations could not have fought more effectively than they did.

The Allied approach to coalition war was one of the foundations of victory and I believe that the evidence is overwhelming in this regard. Conversely, the German approach to coalition war—and strategy in general—was bankrupt and played a central role in Germany's failure.

Dr. James Corum, Lt. Col. USAR

Re-attack

I am humbled by Dr. Corum's command of the history of World War II. His analysis is impeccable; his writing clear; his conclusion flawed. Wars are not won by iron alone. There is an undefined quality that exists in some warriors that cause them to be superior regardless of the arms they bear. History is replete with this fact and the literature attests to it better than

my poor words. It would be simplistic to state that this special quality of a warrior by itself is sufficient for victory: it isn't. Iron does count, but my thesis is that the hand that wields the weapon counts the most. It is suggested that if the Romanians and the Italians had had the exact same military equipment and in the same numbers as the Americans, they would still have been defeated because their warriors had neither the heart nor motivation for battle. Even when faced with better weapons in greater numbers wielded by skilled warriors and experienced leaders, an inferior but highly motivated force can still prevail. What better example than the Battle of Britain? ("Never in the field of human conflict was so much owed by so many to so few.") That undefined quality of the human spirit that raises the ordinary man and woman to perform tasks beyond normal human comprehension is the quality that defeats a superior force, fosters invention, saves lives, builds nations and improves human existence. That undefined quality in warriors is usually found in democratic societies where freedom of thought generates abilities to innovate and initiate independent thought and action.

Dr. Corum presents strong evidence about how the Germans missed an opportunity to capitalize on the resources of their allies, but their most serious deficiency was their inability to inspire the people of Italy and Romania to fight diligently for the German cause. In the end,

the American and Allied warriors defeated the Germans' spirit as well as their iron.

"Bill" Getz

Editor. This exchange of letters illustrates a classic clash of views over the nature of history. One school believes that history concerns only what actually happened in the past—verifiable facts. Another group prefers to consider the "what if?" factor. It is a fascinating—but speculative—debate. While Dr. Corum speaks with considerable scholarly authority, Colonel Getz speaks from life's experience. It would be interesting to poll our readers. With whom do you agree: Colonel Getz or Dr. Corum? Also, briefly state your reasoning.

President Reagan's SDI

First, hearty kudos to "Air Power History" for your year-long commemoration in 2004 of the U.S. Air Force's entry into the missiles and space field a half century earlier. Your series has been exceptionally informative, comprehensive, insightful and important. Outstanding breadth, depth and perspective. I believe it will serve those interested in military and aerospace history extremely well long into the indefinite future. Good for you.

Second, in the concluding paragraph of his superbly researched and illuminating piece, "Eisenhower and Ballistic Mis-

sile Defense: The Formative Years, 1944-1961" ("Air Power History," Vol. 51, No. 4, Winter 2004), author Donald Baucom notes that "(President) Reagan resurrected ballistic missile defense through a Presidential directive and made it the centerpiece of America's strategic relations with the Soviet Union." In this regard, upon President Reagan's death in June 2004, Gennady Gerasimov, the top spokesman for the Soviet Foreign Ministry during the 1980s, stated that "Reagan bolstered the U.S. military might to ruin the Soviet economy, and he achieved his goal" and that "Reagan's SDI (Strategic Defense Initiative) was a very successful blackmail. The Soviet Union tried to keep pace with the U.S. military buildup, but the Soviet economy couldn't endure such competition."* Many believe that President Reagan's defense buildup, including notably his stunning Strategic Defense Initiative, was a major factor in accelerating Soviet economic problems leading to the collapse of the Soviet Union in 1991.

*Maj. Gen. Richard T. Boverie, USAF (Ret.)
West Palm Beach, Florida*

* Associated Press news article, dateline Moscow, June 5, 2004. Can be seen among other places on the MSNBC website at www.msnbc.msn.com/id/5145921

Guidelines for Contributors

We seek quality articles—based on sound scholarship, perceptive analysis, and/or firsthand experience—which are well-written and attractively illustrated. The primary criterion is that the manuscript contributes to knowledge. Articles submitted to *Air Power History* must be original contributions and not be under consideration by any other publication at the same time. If a manuscript is under consideration by another publication, the author should clearly indicate this at the time of submission. Each submission must include an abstract—a statement of the article's theme, its historical context, major subsidiary issues, and research sources. Abstracts should not be longer than one page.

Manuscripts should be submitted in triplicate, double-spaced throughout, and prepared according to the *Chicago Manual of Style* (University of Chicago Press). Use civilian dates and endnotes. Because submissions are evaluated anonymously, the author's name should appear only on the title page. Authors should provide on a separate page brief biographical details, to include institutional or professional affiliation and recent publications, for inclusion in the printed article. Pages, including those containing illustrations, diagrams or tables, should be numbered consecutively. Any figures and tables must be clearly produced ready for photographic reproduction. The source should be given below the table. Endnotes should be numbered consecutively through the article with a raised numeral corresponding to the list of notes placed at the end.

If an article is typed on a computer, the disk should be in IBM-PC compatible format and should accompany the manuscript. Preferred disk size is a 3 1/2-inch floppy, but any disk size can be utilized. Disks should be labelled with the name of the author, title of the article, and the software used. WordPerfect, in any version number, is preferred. Other word processors that can be accommodated are WordStar, Microsoft Word, Word for Windows, and AmiPro. As a last resort, an ASCII text file can be used.

There is no standard length for articles, but 4,500-5,500 words is a general guide.

Manuscripts and editorial correspondence should be sent to Jacob Neufeld, Editor, c/o *Air Power History*, P.O. Box 10328, Rockville, MD 20849-0328, e-mail: jneufeld@comcast.net.

News

New CMSAF Insignia

A new chief master sergeant of the Air Force insignia made its debut on November 1, 2004. The new insignia contains the Great Seal of the United States of America and two stars in the upper blue field. The chevrons and the laurel wreath surrounding the star in the lower blue field remain unchanged to retain the legacy of the stripe worn by all fourteen chief master sergeants of the Air Force.

Air Force enlisted insignias have evolved over the years, while maintaining the historical roots of the Airman star and chevrons. Today, each grade has a definable rank. Some positions such as command chiefs and first sergeants have additional distinguishing features. Senior Air Force leaders, former chief master sergeants of the Air Force and Airmen throughout the service encouraged a redesign of the CMSAF insignia. In 2002, the process began to select a stripe that would mark a stronger representation of our enlisted force. "A lot of people, including my predecessors, have said that the current stripe, although it is distinctive, may not be easily recognized," said CMSAF Gerald R. Murray. That distinction is important, Chief Murray said, because the chief master sergeant of the Air Force is the senior representative of more than 300,000 enlisted Airmen. In 2003, the Air Force chief of staff and some former chief master sergeants of the Air Force agreed to change the insignia. Inspiration for the redesign came from the CMSAF's official emblem, which contains the seal that has been the official national symbol since 1787. Insignia of the top enlisted leaders from the other services provided additional inspiration. The insignia of the sergeant major of the Army also contains the seal. The insignia of the master chief petty officers of the Navy and of the Coast Guard contain an eagle with three stars above it. The sergeant major of the Marine Corps' insignia uses its service emblem and two stars. All stand out from the ranks of their peers and subordinates.

Air Force Chief of Staff Gen. John P. Jumper said he liked the new stripe so much he wanted Chief Murray to put it on as soon as possible. **(Chief Murray wears the new insignia, above right.)**

TSgt. David A. Jablonski, Air Force Print News



World War I Aviation Coming to Air Force's National Museum

DAYTON, Ohio - One of the nation's premier historical aviation events will bring the excitement and adrenaline of World War I air power to the National Museum of the United States Air Force September 30 to October 2, 2005.

The Dawn Patrol Rendezvous World War I Fly-In will feature vintage original and reproduction World War I aircraft flying over the museum, with aircraft launching from and landing on the museum's rear field. The event will feature full scale and 7/8-scale war birds such as the Nieuport, Fokker DR-1 triplane, SE.5 and Curtiss JN4D Jenny. Pilots will perform precision flying in the skies above the museum and will compete in flour-bombing and balloon-busting competitions. Additional activities will include flying exhibitions by World War I radio-controlled aircraft, era automobiles on display and participating in a parade, period re-enactors in a war encampment setting and a "swap and shop." The last Dawn Patrol event at the museum took place in fall 2003, drawing approximately 50,000 visitors for the three-day weekend event. Pilots and vendors interested in participating in the event or members of the public seeking more event information should call (937) 255-8046, ext. 492, or send an email to denise.bollinger@wpafb.af.mil. The National Museum of the United States Air Force presents the mission, history and capabilities of America's Air Force. The institution is the world's largest and oldest military avia-

tion museum, attracting nearly 1.2 million visitors each year to view its more than 300 aircraft and aerospace vehicles, thousands of artifacts and more than seventeen acres of indoor gallery space.

For more event information, contact Chris McGee in the museum's Public Affairs Division at (937) 255-4704, ext. 332.

Cheers to Dr. Corum

Lt. Col. James Corum in Baghdad last year (**photo at right above**). Cheers to Dr. Corum; he has been awarded a prestigious fellowship to Oxford University and will leave Air University, at Maxwell AFB, Alabama, for the United Kingdom.

Notices

I recently purchased a 1943 Beechcraft UC-43 Staggerwing (Ser. No. 4914; FAA Reg. No. 51121, AAF Ser. No. 43-10866). This aircraft was manufactured in 1943. I have all the records when the aircraft was sold in July 1945 and am seeking any information on the history of the aircraft during its AAF service, from 1943 to 1945. The aircraft is still flying and in fine condition. Contact me at:

Kurt F. Bromschwig
9651 16th Avenue South
Bloomington, MN 55425
(952) 881-1600; Cell (612) 810-5300;
Fax (952) 881-1818;
e-mail: Bromschwig@aol.com



Reunions

The **41st Military Airlift Squadron** reunion will be held March 30-April 3, 2005, in Charleston, S.C. Contact:

Scotty White
(843) 763-6516 or (843) 367-9510
website: 41mas.com

The **55th Reconnaissance Squadron** will meet April 27-28, 2005, in Las Vegas, Nevada. Contact:

Buck Buchanan
330 Vine St.
Vacaville, CA 95688
(707) 446-2825

The **6091st Reconnaissance Squadron** will meet April 27-28, 2005, in Las Vegas, Nevada. Contact:

Buck Buchanan
330 Vine St.
Vacaville, CA 95688
(707) 446-2825

The **P-47 Thunderbolt Pilots Association Final Reunion** will be held May 5-8, 2005, in Seattle, Washington. Contact:

Staryl Austin
e-mail: p47288@juno.com or
www.p47pilots.com

The **20th Fighter Wing Association** will hold its reunion on October 26-30, 2005, in Tucson, Arizona:

The **27th Fighter Wing** (Kearney Field/Bergstrom AFB era) will hold a reunion in San Antonio, Tex., September 22-24, 2005. Contact:

John McConnell
(210) 824-1329
e-mail: johnmc@stic.net

The **Order of Daedalians Convention** will be held May 26-29, 2005, in San Antonio, Texas. Contact

Daedalian Headquarters
(210) 945-2111 or
(360) 663-2521
e-mail: daedalus@daedalians.org or
Info@TheReunionBRAT.com

The **459th Bomb Group Association** will meet in Shreveport, Louisiana, September 29-October 2, 2005. Contact:

Charles "Skip" Johnson #1388
PO Box 6419
Bossier, LA 71171
(318) 549-0522
or
John Devney #002, Director
30 Kimbark Rd.
Rochester, NY 14610
(585) 381-6174

The **TAC Missileers** will hold their reunion in **2005** in Nashville, Tennessee. Contact

Joe Perkins
(904) 282-9064
e-mail: perkster@fcoll.com

If you would like to have your reunion listed, please include the name of your association, dates of the reunion, city and state, contact individual with their address, phone number, fax number, e-mail and/or website. Send information to Air Power History, PO Box 10328, Rockville, MD 20854 or via e-mail: jneufeld@comcast.net. Please send announcements as soon as possible.

U.S. Navy readers are advised to log on to www.navalinstitute.org and then click on reunions.

Reviewers

Air Power History

List of Referees,
Dec. 2003-Dec. 2004

George Bradley
David Chenoweth
James Corum
George Cully
Dwayne Day
Rita V. Gomez
R. Cargill Hall
I. B. Holley
Perry Jamieson
Lawrence Kaplan
Betty Kennedy
Mark Mandeles
Roger G. Miller
Daniel Mortenson
Patrick E. Murray
Roger Launius
Helen O'Day
John S. Patton
Rick W. Sturdevant
Park Temple, III
Wayne Thompson
George M. Watson, Jr.
George K. Williams
Richard I. Wolf
Herm Wolk
Tom Y'Blood



The “What is it?” aircraft in our last issue was the Martin Marietta X-24A lifting body.

From 1963 to 1975, eight lifting body vehicles were flown in a joint Air Force-NASA effort at Edwards Air Force Base, California. They varied from the bulbous, unpowered, plywood M2-F1 to the final version of our mystery plane, the needle-nosed, rocket-powered, supersonic X-24B. These were viewed as proof-of-concept vehicles for a future spacecraft that would land like an airplane after surviving the searing heat of reentry from space. The lifting bodies contributed enormously to the technology of the space shuttle orbiter vehicle.

On its web site, the National Museum of the Air Force explains this seemingly futuristic and unusual craft: “The X-24A...was designed to investigate flight characteristics within the atmosphere from high altitude supersonic speeds to landing, and to prove the feasibility of using lifting bodies for return from space,” says the Museum’s web site. The X-24 was a wingless aerospacecraft, which derived lift from its body contours and aerodynamic control surfaces.

As an experimental X-craft, the X-24A tested the concept of a craft that could be launched into

space by rocket boosters to ferry crews to space stations. Upon reentry into the atmosphere, a full-sized craft would be maneuvered to a landing site.

Carried aloft by an NB-52B Stratofortress (the famous 52-0008, or “Balls Eight,” which was retired on December 17th, after forty-nine and one-half years of service), the X-24A completed its first flight on March 19, 1970, piloted by Major (later Colonel) Jerry Gentry and reached a speed of Mach 0.87. It was powered by a Thiokol XLR-11 rocket engine of 8,000 lbs. thrust, identical to the one that had propelled the Bell XS-1 on its first supersonic flight twenty-three years earlier.

The sole X-24A (serial 66-13551) completed eighteen powered flights up to June 1971. In 1972, the X-24A was stripped to its basic framework and rebuilt as the X-24B with a long, pointed nose. The X-24B flew thirty-six times, the last time on November 26, 1975.

Twenty-six readers submitted postcards in our “name the plane” challenge. The winner of the History Mystery, and recipient of a prize aviation book, is retired Lt. Col. Bob Anderson of Fort Walton Beach, Florida.

This Issue's Mystery Plane

Once more, we present the challenge for our ever-astute readers. See if you can identify this month’s “mystery” aircraft. But remember, please: postcards only. The rules, once again:

1. Submit your entry on a postcard. Mail the postcard to Robert F. Dorr, 3411 Valewood Drive, Oakton VA 22124, e-mail: robert.f.dorr@cox.net.

2. Correctly name the aircraft shown here. Also include your address and telephone number, including area code. If you have access to e-mail, include your electronic screen name.

3. A winner will be chosen at random from the postcards with the correct answer. The winner will receive an aviation book by this journal’s technical editor.

This feature needs your help. In that attic or basement, you have a photo of a rare or little-

known aircraft. Does anyone have color slides? Send your pictures or slides for possible use as “History Mystery” puzzlers. We will return them.

Photo below courtesy of Steve Savko.

