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**NEW INSTRUMENTS OF DARKNESS COME TO LIGHT:
THE ROLE OF AIRBORNE INTELLIGENCE ASSETS IN MODERN WAR**

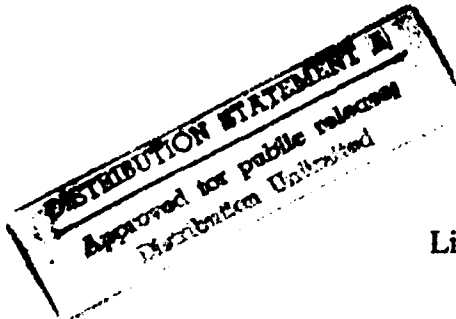
by

John J. Caban
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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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FUNDAMENTAL THEMES:

**"The *Instruments of Darkness* tell us truths,
Win us with honest trifles, to betray's
In deepest consequence."**

**-Shakespeare,
Macbeth-**

**"Historical examples provide the best kind
of proof in the empirical sciences. This is
particularly true of the art of war."**

**-Clausewitz
On War-**

**"America has only one air force, the United States Air Force.
The Army, Navy, and Marine Corps each have aviation arms essential
to their assigned warfighting roles. Each air arm provides unique but complementary
capabilities. They work jointly to project America's Air Power."**

**-General Colin L. Powell
Chairman, Joint Chiefs of Staff-**

ABSTRACT

NEW INSTRUMENTS OF DARKNESS COME TO LIGHT: THE ROLE OF AIRBORNE INTELLIGENCE ASSETS IN MODERN WAR

During Operations DESERT STORM and DESERT SHIELD, commanders at the operational level received immediate battlefield intelligence on video screen--a revolutionary way of fighting war. For the first time, intelligence information from E-3A AWACS, E-8A Joint STARS and RC-135 RIVET JOINT aircraft were melded together by datalink and sent via satellite to the theater CINC, his subordinates at the tactical level, and even to his superiors at National Command Authority, the strategic level. For the first time, battlefield intelligence available only at the tactical level twenty five years before, now was available in real-time at both operational and strategic levels. Consequently, these intelligence assets have become more than force multipliers--"force enablers"--they enable the "shooters and bomb-droppers" to do their jobs. Quite simply, "pin-point targets need pin-point intelligence." This paper will show how best to employ these assets at the operational level of war through training, joint interoperability and flexibility--but there are trade-offs.

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PREFACE

A portion of the information presented in this paper comes from personal experience as Squadron Commander of the RC-135 RIVET JOINT aircraft during DESERT STORM and DESERT SHIELD operations in the Persian Gulf. The author was selected to develop a briefing which was given to the Secretary of the Air Force and Air Force Chief of Staff, respectively, detailing the revolutionary way of using airborne intelligence assets during the War in the Gulf.

Special thanks to Captain Donald H. Estes, USN, for his review of this paper's draft outline and thesis, for access to his classified publications, and finally, for his recommendations to ensure all topics were written using unclassified sources.

Any assumptions made or perceived are the responsibility of the author and in no way reflect the views of the United States Air Force or the United States Navy.

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NEW INSTRUMENTS OF DARKNESS COME TO LIGHT: THE ROLE OF AIRBORNE INTELLIGENCE ASSETS IN MODERN WAR

CHAPTER I

INTRODUCTION

Thesis. The aim of this paper is to show how best to employ airborne intelligence assets at the operational level of war. Specifically, the Theater CINCs need to identify now those airborne intelligence assets they will need in war, and how to plan, train and use them to best advantage. This paper will focus on the crisis response element of national military strategy in light of military, economic, and political constraints within the New World Order.

New World Order. With the demise of the Soviet Union and Warsaw Pact, the bipolar world dissolved and the shift towards a multipolar world began. Simply, the Cold War has ended. Secretary of Defense Richard Cheney stated that from 1985 to 1997, defense spending will have dropped 37 percent in real terms--only 3.4 percent of the Gross National Product--the lowest since Pearl Harbor.¹ The new threat assessment and fiscal constraints--reflecting a "New World Order"-- have pared down our military forces. A new military strategy stressing flexible, rapid response to "hot spots" around the world, has driven military leaders to make our fighting forces as effective as possible. General Colin Powell, Chairman of the Joint Chiefs of Staff (CJCS), said, " Our force for the 1990s is a Base Force--A Total Force--A Joint Force..." with a strategy that "...provides the rationale for a reduced yet appropriate military capability...throughout the remainder of the 1990s."²

New Strategy. In his Aspen Speech of August 1990, President Bush introduced a new, regionally oriented, national defense strategy "...built upon the four foundations of Strategic Deterrence and Defense, Forward Presence, Crisis Response, and Reconstitution."³ Since President Clinton has not yet developed a national defense strategy, this paper will focus on

President Bush's crisis response element of national military strategy with emphasis on the Air Force concept of Global Reach-Global Power.

Crisis Response--Global Reach/Global Power. General Powell, CJCS, articulated that in crisis response, "US forces therefore must be able to respond rapidly to deter and, if necessary, to fight unilaterally or as part of a combined effort...to defeat a regional aggressor."⁴ In support of crisis response, the Air Force developed the concept of *Global Reach-Global Power*, "...a framework that builds on the unique attributes of air powerspeed, range, flexibility, precision, and lethality."⁵ Even so, current plans are to reduce the total number of Air Force assets by 1,000 aircraft. However, one method of significantly increasing the effectiveness of our "leaner" fighting forces is to tailor our Air Force operational intelligence resources to provide real-time targeting and threat information to operational level commanders. Never was this better demonstrated than during the War in the Persian Gulf, DESERT STORM.

DESERT STORM--Revolutionary Way of Fighting. During Operations DESERT STORM and DESERT SHIELD, commanders at the operational level received immediate battlefield intelligence on video screen--a revolutionary way of fighting war. For the first time, intelligence information from E-3A AWACS, E-8A Joint STARS and RC-135 RIVET JOINT aircraft were melded together by datalink and sent via satellite to the theater CINC, his subordinates at the tactical level, and even to his superiors at National Command Authority, the strategic level. For the first time, battlefield intelligence available only at the tactical level twenty-five years before, now was available in real-time at both operational and strategic levels. Consequently, these intelligence assets have become more than force multipliers--"force enablers"--they enable the "shooters and bomb-droppers" to do their jobs. Quite simply, "pin-point targets need pin-point intelligence."

CHAPTER II

HISTORICAL BACKGROUND

Radar/Communications: Key Intelligence Technologies. As in war generally, historical examples of intelligence applications provide key insight into their value. In his monumental book on Electronic Warfare during World War II, *Instruments of Darkness*, Alfred Price reported on the radar battle between German and British forces, and the impact this "Secret War" had upon the final outcome.⁶ Similarly, during the Vietnam War, a then-classified communications net called "T-Ball" was used to provide pilots a situational-awareness-backup of threats to their aircraft.⁷

Over the last 50 years, these two intelligence technologies--radar and communications--have been keys to threat warning, target cueing, SAR (search and air rescue), target damage assessment and other vital functions used in war. Due to the explosion of technology, not only have active sensors such as radar gone airborne (e.g. AWACS and Joint STARS), but passive sensors (e.g. RIVET JOINT) as well. The fact that RIVET JOINT, AWACS and Joint STARS performed so well during DESERT STORM provides fundamental insight into the military strategy of using them in the future.

DESERT STORM: Technological Triumph. The astounding success of allied forces against Iraqi forces (shown in virtual real-time by TV/media) resulted in many weapons achieving celebrity status. "F-117 Stealth," "Patriot," "Tomahawk," "Wild Weasel and HARM," "F-15 and air-to-air missiles," "A-10 and Maverick," "Hellfire and TOW missiles," "Apache and Blackhawk Helos"--all became instant household names. However, the unsung technology

heroes might well be the intelligence (and command and control) assets such as RIVET JOINT, Joint STARS and AWACS--they performed so well that they were nearly transparent--they were not just force multipliers, but force enablers.⁸ Perhaps known only to the true operations planning experts, they helped all the above "sexier" systems in one way or another. Yet, the uncertainties of an ill-defined threat in a post-DESERT STORM/post-Cold War world leads us, as General Merrill A. McPeak, Air Force Chief of Staff (AFCS) said, from "high threat, high stability to low threat, low stability."⁹

CHAPTER III

ANALYSIS

The Threat: Universal, Uncertain, Unstable. The so-called end of the Cold War brought with it an end of emphasis on the Soviet threat. As operations in DESERT STORM vividly demonstrated, the threat now is nearly universal."¹⁰ In an effort to package operational assets to potential threats, Senator Aspin suggested we measure future conflicts with DESERT STORM as the standard.¹¹ The irony of this is that both CJCS General Powell and National Security Advisor Brent Scowcroft have said that we would not have the military strength to repeat DESERT STORM by 1995, and maybe as early as 1993.¹² Thus, the national military strategy focuses on "North Korea, a weakened Iraq and Iran" as the primary threats in the world. "But the real threat we now face is the threat of the unknown, the uncertain. The threat is "instability" and being unprepared to handle a crisis or war that no one predicted or expected."¹³ This is certainly true today, as our political leaders address the issue of committing military forces into Bosnia-Herzegovina. However, once committed, an operational commander must respond to and perform in unpredictable, uncertain situations.

Alternative Assets. Within the scope of this paper and its focus on crisis response, we define an "airborne intelligence asset" as an aircraft which can provide real-time threat and target information to friendly forces in the air, on the ground, or at sea. Since crisis response demands rapid reaction world-wide, this would rule out, for instance, the RC-12D Guardrail V, RV-1D Quick Look II and EH-60A--all excellent army corps-level airborne intelligence assets--which lack intercontinental range.¹⁴ If a carrier battle group (CVBG) were deployed near a "hot spot" where crisis response was needed, two excellent naval assets would meet our definition--the E-2C Hawkeye, and the ground-based EP-3 electronic surveillance aircraft.¹⁵ The Hawkeye

provides airborne active radar coverage (the "eyes") while the EP-3 collects with passive sensors (the "ears"). However, these assets are used mainly to support naval activities, and might not be available in other parts of the world. Additionally, both aircraft are propeller driven, limiting their speed, range and thus highlighting their drogue requirements for air refueling. Then, too, are the roles and missions problems between the EP-3 program and the more highly visible RC-135 RIVET JOINT, underlined by Senator Sam Nunn's floor speech on 2 July 1992.¹⁶ Consequently, "the House denied a \$32.9-million request for P-3 modifications."¹⁷ Therefore, we will concentrate only on Air Force assets--RC-135 RIVET JOINT, E-3A AWACS, and E-8 Joint STARS aircraft. We will address these aircraft in terms of their intelligence capabilities (and discuss command and control aspects later).

RC-135 RIVET JOINT. Probably the premier SIGINT (signals intelligence, consisting of ELINT--electronics intelligence--and COMINT--communications intelligence) collector in the world, RIVET JOINT (RJ) became known as the "Ears of the (DESERT) STORM." Relatively unknown in the news media until the Gulf War, RJ has a remarkable and storied career. It has provided support to US forces for virtually every newsworthy "hotspot" in the world. Although its mission--even in peacetime--is shrouded in secrecy, it is the "daddy rabbit" for a remarkable link, used for the first time during DESERT STORM, called TIBS (Tactical Information Broadcast Service) which provided real-time intelligence data to theater and tactical commanders, including air assets such as AWACS and Joint STARS. Additionally, TIBS was relayed real-time via satellite to the highest levels of national command authority, who could monitor the war first-hand. TIBS receivers were distributed to army attack helicopter forces, SAR (Search and Air Rescue) and special operations forces on the ground. Naval forces received RJ data via Link 11. RJ has numerous radio/relay links in both secure and unsecure modes. It is a large aircraft (crew of 30-34) and long loiter time--some missions during the Gulf War lasted over 20 hours.¹⁸ RJ provided threat warning, target cueing, SAR, and other highly classified functions. "The Iraqis were good (in EMCON--emission control), but not good

enough to beat the electronic sweep of the shadowy RC-135s."¹⁹ RJ's main operating base is Offutt AFB, Nebraska.

E-3A AWACS ("Sentry"). Known as the "Eyes of the STORM," the AWACS (Airborne Warning and Control System) provided outstanding radar coverage during the War in the Persian Gulf. It is the *sine qua non* in conditions where air superiority fighter aircraft are needed. "Allied air forces flew more than 110,000 combat and support sorties during the war, and the responsibility for controlling the great majority of the missions was in the hand of AWACS operators."²⁰ Col Gary Voellger, commander of 52d Airborne and Control Wing said, "We connected all of the aircraft and ground stations together for a continuous radar picture from the Arabian Sea to the Red Sea."²¹ AWACS has a wealth of other radio/relay links, both secure and unsecure. Like RJ, AWACS is a Boeing 707 airframe capable of long loiter times, flying as many as three continuous orbits, linking its air picture to RIVET JOINT and all air defense aircraft under its control. Basic operating crew is 17, but room is available for much more during extended flights.²² Due to its phenomenal effectiveness, the "Frisbee" has been purchased by NATO and other countries such as Saudi Arabia, UK and France.

E-8A Joint STARS(Surveillance Target Attack Radar System). Of all the airborne assets used during DESERT STORM, none have had greater, if unexpected, success than Joint STARS: "Joint STARS arrived in-theater hours before DESERT STORM began. With six years of development still to go, it was deployed into combat within 48 hours of arrival."²³ Its ability to provide real-time targets in war was underestimated. General McPeak, AFCS said, "Joint STARS is a huge success...and I don't think the United States will ever want to go to a combat situation again without a Joint-STARS-like system."²⁴ Analogous to AWACS, which uses its radar to track targets in the air, Joint STARS provides intelligence and targeting data on enemy ground targets. "The most impressive feature of Joint STARS is the ability to serve Air Force operators in aircraft and Army ones in ground service modules simultaneously....The phased-array radar has two primary operating modes--synthetic aperture radar (SAR) and wide area

surveillance--that operate simultaneously. The Army is interested primarily in SAR imagery to identify fixed targets...The Air Force, looking for moving targets, is more interested in wide area surveillance, using moving target indication (MTI)."²⁵

Military Considerations.

RC-135 RIVET JOINT. Of the three assets, RJ can respond quickest in a crisis response--in many ways this has been its peacetime job for the past 30 years. It routinely deploys overseas to Japan, UK, Greece, Alaska and Saudi Arabia. RJ is the only asset of the three to deploy to all the crisis areas since *Operation El Dorado Canyon* (Libya). When AWACS was unable to deploy initially during *Operation Provide Comfort* (Kurdish humanitarian relief), RJ was on station providing threat warning for U.S. fighter aircraft. Unlike AWACS and Joint STARS, RJ does not need threat warning protection--it is the ultimate threat warning receiver. Once flying along the borders of the Soviet Union during the Cold War, RJ crews are used to being "up close and personal " to hostile threats. All the sensors aboard RJ are passive--this is important, since enemy fighters will not "see" RJ unless they "paint" the aircraft on their radars (or see it visually)--with a pencil-beam radar, this is difficult.

AWACS. Like RJ, AWACS can respond quickly--it routinely deploys to Japan, UK, and Alaska. AWACS has approximately 34 aircraft--over twice the number of RJ--and works routinely with fighter aircraft during training such as Red Flag at Nellis AFB. The AWACS radar is primarily an active pulse/pulse doppler radar, but has a passive scan feature as well. Since its radar mode is primarily active, it highlights itself to hostile aircraft who can see its powerful beam on its threat receivers. If fighter CAP aircraft such as F-15s are committed to a crisis response, this is not a problem. However, before a final decision is reached to respond to a crisis, AWACS will not deploy--this is not true of RIVET JOINT, which already will be on location, gathering electronic order of battle (EOB) intelligence.

Joint STARS. Like RJ and AWACS, Joint STARS is a large Boeing 707 airframe variant, capable of long range and long loiter time. Carrying as many as 34 personnel, the system is

designed to "spot the movement of helicopters, surface ships...and tracked and wheeled vehicles from distances of 200 km. or more."²⁶ Joint STARS has an astounding capability which "...with minor modifications, Grummon officials said the aircraft could control unmanned aerial vehicles, provide targeting information for precision-guided missiles and operate as an airborne command post."²⁷ Joint STARS is still in Full Scale Development (FSD), with the third aircraft due to fly in 1993.²⁸ Due to the limited number of aircraft, and those in FSD, Joint STARS would have the most difficult time responding to a near-term crisis response. As in the case of AWACS, Joint STARS would not deploy unless a firm decision has been made to respond to a crisis. Furthermore, since J-STARS is used by both army and air force to find ground targets (e.g., armored tank columns), those assets which strike ground targets (e.g. A-10s and attack helos) would have to deploy as well.

Force Enablers. To sum up the discussion above, all three intelligence assets can respond rapidly during a crisis response, have great range, large crews, long loiter times, and work real-time to enable the "shooters and bomb-droppers" to do their jobs--they are Force Enablers. This is particularly important now, in the post-DESERT STORM time-frame, where some of the "star performers" above (see last paragraph on p. 3) have dwindled in numbers (Wild Weasel , A-10) or whose performance has come into question (Patriot Missiles^{29,30,31}). Weapons systems have become so complex that they need "pin-point" intelligence to hit "pin-point" targets. "Aircraft directed by Joint-STARS had a 90% success rate in finding targets on the first pass. In one incident two A-10s and an AC-130 directed by Joint-STARS destroyed 58 of 61 vehicles in a single convoy."³² An Iraqi army corps commander said that "...he had direct communications with Baghdad only once during the war, but it was not because his links were destroyed. The Iraqis were petrified about sending any transmission for fear that U. S. signals intelligence analysts (RC-135) would hear it and immediately have the Iraqis bombed."³³ "...More than 4,000 aircraft operated in the Gulf theater--1,200 fighters, plus tankers, surveillance and reconnaissance, bombers and support aircraft. AWACS played a crucial role 'in controlling this

spaghetti,' reinforcing the value of this capability for airborne control."³⁴ This is what our three assets do best--and they perform best together. The following table summarizes their capabilities, including what assets they work with and what their missions can provide.

	RIVET JOINT	AWACS	JOINT STARS
AIR ASSETS.....	X.....	X.....	X
AIR TARGETS.....	X.....	X.....	O
GROUND ASSETS.....	X.....	O.....	X
GROUND TARGETS.....	X.....	O.....	X
TARGET CUEING.....	X.....	X.....	X
TARGET BDA.....	X.....	X.....	X
THREAT WRNG.....	X.....	X.....	X
IDENT C ³ LINKS.....	X.....	O.....	O
SEARCH/RESCUE.....	X.....	X.....	X
PASSIVE SENSOR.....	X.....	O*	O

X = Capability O = No capability * = Capability to track enemy ECM

The point of the table is not to dwell on limitations--each asset does what it was designed to do--but to demonstrate the remarkable capability to enable other assets to perform at their peak.

RJ's ability to perform across the board is the result of its passive sensors and TIBS.

Crisis Response Scenario. It is nearly certain that we will not have a 5-6 month build-up for a crisis response as we had for DESERT STORM. A likely scenario will require nearly all our forces and logistics to be flown in--this will certainly be true initially. The threats and targets in the crisis will determine if and when our three intelligence assets will play. Certainly, RIVET JOINT will respond in any event, providing senior national leadership with information on how and when to respond to the crisis. If the response is a single, surgical, surprise air attack such as the "Libyan Raid," then F-15s (and AWACS) will not be used. However, any response longer

than a single raid is likely to require AWACS and fighter CAP support. Any scenario in which Joint-STARS responds will require two conditions. First, a viable ground target, such as massed tank/armor must be identified. Second, either air or ground "shooters" (AH-64 Apache, A-10) must be deployed to the region. Taking J-STARS away from its ongoing Full Scale Development is another key decision which will have to be made before it is committed.

Political Considerations.

Foreign Interest. The dazzling display of high tech wizardry by RIVET JOINT, AWACS and J-STARS during the Gulf War was not lost on shrewd, observant Saudi Arabia. "The kingdom plans to obtain aerial sensor platforms such as the U.S. Air Force/Army Grumman joint surveillance target attack radar system (Joint STARS) E-8 aircraft. Additional Boeing E-3 airborne warning and control system (AWACS) aircraft and 48 new F-15E ground attack aircraft also are considered as priorities....Saudi Arabia also is seeking an electronic intelligence aircraft similar to the U. S. Air Force's RC-135.... KC-135 tankers...now are being converted to electronic intelligence aircraft working with the U.S. Air Force and E-Systems...."³⁵ It is vitally important that we consider carefully the ramifications of selling these intelligence assets as part of Foreign Military Sales. What made the Air War in the Gulf so decisive was that we did not have to worry about our enemy, Iraq, having the same intelligence advantage that we enjoyed.

Roles and Missions. Thus far, we have discussed RIVET JOINT, AWACS and Joint STARS only in terms of their considerable intelligence capabilities. The role of Command and Control of aircraft is a very sensitive issue for AWACS--they view that as their own. Historically, they certainly have precedence for their feelings. However, RIVET JOINT participation in Red Flag Exercises at Nellis Air Force Base and Joint STARS spectacular results during DESERT STORM call for a closer re-examination. At Red Flag, fighter aircraft were "shot down" because RJ warnings passed to AWACS were not reaching friendly aircraft in time. Therefore, RJ passed the warning directly to friendly fighters and it worked well. This also happened

during the Gulf War, when AWACS failed to pass a threat advisory to air defense aircraft for over 30 minutes, resulting in a tertiary backup fighter finally shooting down two hostile fighters.³⁶ Similarly, Joint STARS poses a threat to the AWACS community. "...The majority of targets relayed to fighters were handled by having the fighters assigned directly to a Joint-STARS weapons allocation officer...(this) was a new position instituted for Desert Storm missions, and it represented a more active role for Joint-STARS than was originally envisioned....(It) operated with a USAF colonel serving as a mission commander in the back of the aircraft."³⁷ Also, "...with minor modifications, Grumman officials said (Joint-STARS) could control unmanned aerial vehicles, provide targeting information for precision-guided missiles and operate as an airborne command post (author underlined)."³⁸

Organizational Divisions. Beginning with RIVET JOINT, there are deep organizational divisions which hinder the effectiveness of optimum mission accomplishment. RJ crews actually consist of three squadrons--one squadron of pilots and navigators, a second squadron of electronic warfare officers (navigator specialists called "Ravens") responsible for ELINT collection, and a third squadron of specialists who specialize in COMINT collection.

Furthermore, the three squadrons are in two different commands--the pilots, navigators and Ravens from Air Combat Command (ACC), and the other squadron from Air Force Intelligence Command (AFIC). An overarching organizational problem is that even though RIVET JOINT, AWACS and Joint STARS are in the same command, ACC, they are in different Numbered Air Forces, with no one person in charge at a low enough level to oversee that training (and fighting together in war) is consistently prosecuted.

Finally, there does not exist a single office at Air Staff or on the Joint Staff at the Pentagon to ensure that competition for funding--both within DoD and Congress--is both consistent and fair to each intelligence asset.³⁹

Economic Considerations

Competition for Funding. The roles and missions controversy has been highlighted by the competition for funding, both within the Department of Defense and Congress. AWACS, in an effort to thwart any threat to command and control posed by RJ, sought to fund an "...electronic support measures (EMS) system...providing real-time combat identification capabilities that cannot be met by off board sensors."⁴⁰ However, the House Armed Services Committee (HASC) recommended cutting the \$38.6-million program. Additionally, HASC terminated the \$49.5-million Joint-STARS self-defense suite. "(Secretary of Defense) Cheney said the House's plan to terminate the ...self-defense suite was also based on the 'misperception' that it would only 'replicate certain capabilities provided by Rivet Joint aircraft.'"⁴¹

"Priceless" Assets. Due to the enormous capabilities of all three aircraft, operating together within a neighboring airspace, they present a most lucrative target for any hostile aircraft. Both RJ and AWACS crews were aware during the months of DESERT SHIELD that Iraqi fighter tracks were practicing "pop up" tactics expressly tailored to "take out" intelligence aircraft.⁴² Consequently, any loss of RIVET JOINT, AWACS or Joint-STARS--each costing many hundreds of millions of dollars--would probably not be replaced or rebuilt.

New Intelligence Technology. "Many enabling technologies will be complemented by off-the-shelf components and systems. Basic research programs, such as the Defense Advanced Research Projects Agency's (DARPA's) microwave/millimeter wave monolithic integrated circuit (MIMIC) effort, are providing spin-offs into reconnaissance and surveillance applications...such as ...Joint STARS...and RIVET JOINT."⁴³ Additionally, digital radio frequency memories (DRFMs) offer great possibilities with respect to signal response times, fidelity and the possibility of introducing deception techniques.⁴⁴

CHAPTER IV

CONCLUSION

Air Force Airborne Intelligence Key to Crisis Response. Since "...regional crises are the predominant military threat we will face in the future,"⁴⁵ their demands will be the primary concern of each Theater CINC in his area of responsibility. Thus, our crisis response intelligence assets should be consistent with our National Security Strategy in responding to these regional crises. Air Force assets will be keys to a credible crisis response. "DESERT STORM," stated General McPeak, AFCS, marked "...the first time in history that a field army has been defeated by air power."⁴⁶ Similarly, General Powell, CJCS, said, "I will say this. I've said it before, and I'll say it again: **Air power was decisive in that war. It made the rest of what we had to do much easier. Air power won the game ball in that contest.**"⁴⁷

(Boldfaced used in original) Air Power was decisive because airborne intelligence assets were the "barrel or gun site" which fired the "bullets" of the weapons systems in the right direction. Historically, radar and communications intelligence have been instrumental in modern war. In considering alternative airborne intelligence assets, Army (e.g. Guardrail) and Navy (e.g. E-2C Hawkeye, EP-3) aircraft were ruled out due to lack of range, service commitments and budgeting problems, respectively. However, if we must commit to a rapid, unilateral response in a region such as in Bosnia-Herzegovina, it may happen that Navy E-2C Hawkeye and Army V Corps Guardrail may comprise the "eyes" and "ears", respectively, of our first operations.

Planning. Theater CINCs must begin planning now for the possibility of using different airborne intelligence assets during a crisis response. Initially, it may come from different branches of the service, all with different logistics and communications requirements. If allied forces (e.g. NATO) must be formed, it is quite possible that SIGINT platforms such as the

British Nimrod R aircraft might play--or if a coalition is formed, perhaps a Saudi AWACS, as during the Gulf War. The important consideration is that planning must begin now.

Training. To be successful, we must train as we will fight. First, as a nation, we must continue a rigorous training program. Every opportunity must be used during live-fly exercises to practice using different airborne intelligence assets together.

Optimum Use. From the choices, RIVET JOINT, AWACS and Joint STARS were chosen, all financially and technologically healthy programs with tremendous intelligence programs for the future (e.g. MIMIC, DRFM, Millimeter Wave). They are force enablers--"Instruments of Darkness"--which will make crisis response both a deterrent and a reality in a regional conflict. However, to be most effective, operational commanders cannot be stymied by outdated plans, training shortfalls, logistics limitations or obsolete organizational divisions. Therefore, the following recommendations are made which will improve using these priceless assets at the operational level of war.

1. RIVET JOINT, AWACS and Joint STARS programs must be consolidated in the same office in the Pentagon, specifically a joint office to take advantage of the latter asset's unique capabilities. RJ should take the lead in this office since it will be present during any crisis response scenario--the other two might not. Additionally, RJ programs and equipment will be classified at a higher level due to its peacetime role as a National Asset.
2. All three assets must be within the same Numbered Air Force to consolidate training and operations at the lowest level. It is recognized that a composite wing concept would not work for these aircraft due to the maintenance diversity and sophistication these assets demand.
3. Combine RIVET JOINT program under one command, ACC.
4. Combine the three RIVET JOINT squadrons under the same wing. (They are already located at the same base, Offutt AFB.)
5. Let both RIVET JOINT and Joint STARS talk directly to air assets when necessary.

This does not threaten AWACS' role and mission as the primary command and control agent.

6. Continue joint service training (e.g. Ocean Venture) to wring out connectivity and procedural differences.

7. During annual live-fly allied training (e.g. NATO Central Enterprise) exercises, work with different allied assets to drive resolution of communications and connectivity differences.

NOTES

CHAPTER I

1. Dick Cheney, Secretary of Defense, *Annual Report to the President and the Congress, February, 1992* (Washington: U.S. Government Printing Office, 1992), p. vii.

2. General Colin L. Powell, Chairman of Joint Chiefs of Staff, *National Military of the United States, January, 1992* (Washington: U.S. Government Printing Office, 1992), cover letter.

3. *National Military Strategy of the United States, January, 1992* (Washington: U.S. Government Printing Office, 1992), p. 6.

4. *Ibid.*, p. 7.

5. Donald B. Rice, Secretary of the Air Force, *Annual Report to the President and the Congress, February, 1992* (Washington: 1992), p. 125.

CHAPTER II

6. Alfred Price, *Instruments of Darkness* (New York: Charles Scribner's Sons, 1978), pp. 55-70.

7. Stephen M. Hardy, "Air Force Hits the Intelligence Fastball," *Journal of Electronic Defense*, January 1992, p. 29.

8. Dr. Ralph W. Schrader, "C⁴I: Desert Storm's Unsung Technology Superstar," *Signal Magazine*, May 1991, p. 15.

9. General Merrill A. McPeak, Air Force Chief of Staff, Lecture, U. S. Naval War College, Newport, RI: 16 October 1992.

CHAPTER III

10. Russ Davis, "Electronic Warfare Mission Grows as Budget Declines," *Signal Magazine*, April 1991, p. 23.

11. Rep. Les Aspin, Chairman of House Armed Services Committee, "An Approach to Sizing American Conventional Forces in the Post-Soviet Era," 24 January 1992.

12. Brent Scowcroft and Colin Powell (in *New York Times*), quoted in Julian S. Lake, "From the President," *Journal of Electronic Defense*, April 1991, p. 12.

13. Powell, *op cit.*, p. 4.

14. Stephen M. Hardy, "Reaping the RF Harvest," *Journal of Electronic Defense*, December 1992, pp. 39-43.
15. *Ibid.* pp. 38, 40.
16. Sen. Sam Nunn, "The Defense Department Must Thoroughly Overhaul the Services Roles and Missions," floor speech, 2 July 1992, p. 14.
17. John D. Morrocco, "Cheney Urges Senate to Preserve Funding for F-22, C-17 Programs," *Aviation Week & Space Technology*, 20 July 1992, p. 23.
18. Information taken from personal experiences of the author, Col John J. Caban, as Commander and Operations Officer of the 343d Reconnaissance Squadron (RIVET JOINT), Offutt AFB, Nebraska, from 8 January 1988 through 30 October 1991.
19. Robert S. Hopkins III, "Ears of the Storm," *Air Force Magazine*, February 1992, p. 38.
20. Jeffrey M. Lenorovitz, "AWACS Played Critical Role in Allied Victory Over Iraq," *Aviation Week & Space Technology*, 4 March 1991, p. 23.
21. Col Gary Voellger, quoted in Jeffrey M. Lenorovitz, "AWACS Fleet Supplied Surveillance Crucial to Allies' Desert Storm Victory," *Aviation Week & Space Technology*, 22 April 1991, p. 82.
22. *Jane's All the "World's Aircraft* (London: 1986), pp.364-65.
23. "Command, Control, Communications, and Intelligence," *Aero American*, December 1991, p. 62.
24. E. A. Smith, "Pentagon Weighs Key Reconnaissance Values Highlighted by Gulf War," *Aviation Week & Space Technology*, 22 April 1991, p. 78.
25. Bruce D. Nordwall, "Highly Integrated System, Versatile Radar Win Kudos for Joint-STARS' Gulf Role," *Aviation Week & Space Technology*, 24 June 1991, pp. 48-9.
26. "Two Joint-STARS Aircraft to Support Allied Operations in Persian Gulf Region," *Aviation Week & Space Technology*, 14 January 1991, p. 24.
27. *ibid.*, p. 87.
28. *Jane's, op cit.*, p. 166.
29. Elliot Marshall, "Fatal Error: How Patriot Overlooked a Scud," *Science*, March 1992, p. 1347.

30. David F. Bond, "Army Scales Back Assessments of Patriot's Success in Gulf War," *Aviation Week & Space Technology*, 13 April 1992, p. 64.
31. "A defense specialist with the Congressional Research Service who helped carry out a congressional investigation, said in April that he could find only "one warhead Kill" when he used the Army's methodology for its initial study." Steward M. Powell, "Scud War, Round Three," *Air Force Magazine*, p. 35.
32. David A Fulghum, "Desert Storm Success Renews US Interest in Specialty Weapons," *Aviation Week & Space Technology*, 13 May 1991, p. 85.
33. "Tactical Bombing of Iraqi forces Outstripped Value of Strategic Hits, Analyst Contends," *Aviation Week & Space Technology*, 27 January 1992, p. 62.
34. "Aerial Combat Stimulates Saudi Air Force Blueprint," *Signal Magazine*, August 1991, p. 117.
35. *Ibid.*, pp. 116, 117.
36. Caban, *op cit.*
37. David Hughes, "Joint-STARS Officials Provide Data for Missile Defense Plan Analyses," *Aviation Week & Space Technology*, 27 April 1992, p. 71.
38. "Two Joint STARS Aircraft, etc.," *op cit.*, p. 25.
39. Caban, *op cit.*
40. John D. Morrocco, "Cheney Urges Senate to Preserve Funding for F-22, C-17 Programs," *Aviation Week & Space Technology*, 20 July 1992, p. 23.
41. *Ibid.*, p. 22..
42. Hopkins, *Ibid.*, p. 41-42.
43. Wayne P. Gagner, "Surveillance Proves Primary Need in Tactical Collection," *Signal Magazine*, August 1992, p. 41.
44. Information taken from Gagner, *Ibid.*, p. 42.
45. *National Security Strategy of the United States, August 1991* (Washington: U.S. Government Printing Office, 1991), p. 28.
46. General McPeak, *op cit.*

47. General Colin Powell, "Policy Letter from the Office of the Secretary of the Air Force,"
October 1992.

BIBLIOGRAPHY

- "Aerial Combat Stimulates Saudi Air Force Blueprint." *Signal Magazine*, August 1991, pp. 116-17.
- Aspin, Les. "An Approach to Sizing American Conventional Forces in the Post-Soviet Era." 24 January 1992.
- Bond, David F. "Army Scales Back Assessments of Patriot's Success in Gulf War." *Aviation Week & Space Technology*, 13 April 1992, p. 64.
- Caban, John J. Personal experiences as Commander and Operations Officer of the 343d Reconnaissance Squadron (RIVET JOINT), Offutt AFB, Nebraska, from 8 January 1988 through 30 October 1991.
- Cheney, Dick. *Annual Report to the President and the Congress, February, 1992* (Washington: U.S. Government Printing Office, 1992), p.vii.
- "Command, Control, Communication, and Intelligence." *Aero American*, December 1991, pp. 62-3.
- Davis, Russ. "Electronic Warfare Mission Grows as Budget Declines." *Signal Magazine*, April 1991, pp. 21-24.
- Fulghum, David A. "Desert Storm Success Renews US Interest in Specialty Weapons." *Aviation Week & Space Technology*, 13 May 1991, p. 85.
- Gagner, Wayne P. "Surveillance Proves Primary Need in Tactical Collection." *Signal Magazine*, August 1992, pp. 41-2.
- Hardy, Stephen M. "Reaping the RF Harvest." *Journal of Electric Defense*, December 1992, pp. 34-43, 55.
- Hardy, Stephen M. "Air Force Hits the Intelligence Fastball." *Journal of Electric Defense*, January 1992, pp. 29-31, 69.
- Hopkins, Robert S. III. "Ears of the Storm." *Air Force Magazine*, February 1992, pp. 38-43.
- Hughes, David. "Joint-STARS Officials Provide Data for Missile Defense Plan Analyses." *Aviation Week & Space Technology*, 27 April 1992, pp. 70-71.
- Jane's All the World's Aircraft*. London: 1986.
- Lenorovitz, Jeffrey M. "AWACS Played Critical Role in Allied Victory Over Iraq." *Aviation Week & Space Technology*, 4 March 1991, pp. 23-4.
- Marshall, Eliot. "Fatal Error: How Patriot Overlooked a Scud." *Science*, p. 1347.

McPeak, Merrill A. Lecture. U. S. Naval War College, Newport, RI: 16 October 1992.

Morocco, John D. "Cheney Urges Senate to Preserve Funding for F-22, C-17 Programs." *Aviation Week & Space Technology*, 20 July 1992, pp. 22-3.

National Military Strategy of the United States, January, 1992 (Washington: U.S. Government Printing Office, 1992).

National Security Strategy of the United States, August 1991 (Washington: U.S. Government Printing Office, 1991).

Nordwall, Bruce D. "Highly Integrated System, Versatile Radar Win Kudos for Joint-STARS' Gulf Role." *Aviation Week & Space Technology*, 24 June 1991, pp. 48-9

Nunn, Sam. "The Senate Department Must Thoroughly Overhaul the Services Roles and Missions." Floor Speech, 2 July 1992.

Powell, Colin L. *National Military Strategy of the United States, January, 1992* (Washington: U.S. Government Printing Office, 1992), cover letter.

Powell, Colin L. "Policy Letter from the Office of the Secretary of the Air Force." October 1992.

Powell, Steward M. "Scud War, Round Three." *Air Force Magazine*, pp. 32-35.

Price, Alfred. *Instruments of Darkness*. New York: Charles Scribner's Sons, 1978.

Rice, Donald B. *Annual Report to the President and the Congress, February, 1992* (Washington: U.S. Government Printing Office, 1992).

Schrader, Ralph W. "C⁴I: Desert Storm's Unsung Technology Superstar." *Signal Magazine*, May 1991, p. 15.

Scowcroft, Brent and Powell, Colin. Quoted in *New York Times* in Julian S. Lake, "From the President." *Journal of Electronic Defense*, April 1991, p. 12.

Smith, E. A. "Pentagon Weighs Key Reconnaissance Values Highlighted by Gulf War." *Aviation Week & Space Technology*, 22 April 1991, 78-9.

"Tactical Bombing of Iraqi Forces Outstripped Value of Strategic Hits, Analyst Contends." *Aviation Week & Space Technology*, 27 January 1992, p. 62.

"Two Joint-STARS Aircraft to Support Allied Operations in Persian Gulf Region." *Aviation Week & Space Technology*, 14 January 1991, pp. 24-5.

Voellger, Gary. Quoted in Jeffrey M. Lenorovitz, "AWACS Fleet Supplied Surveillance Crucial to Allies' Desert Storm Victory." *Aviation Week & Space Technology*, 22 April 1992, p. 82.