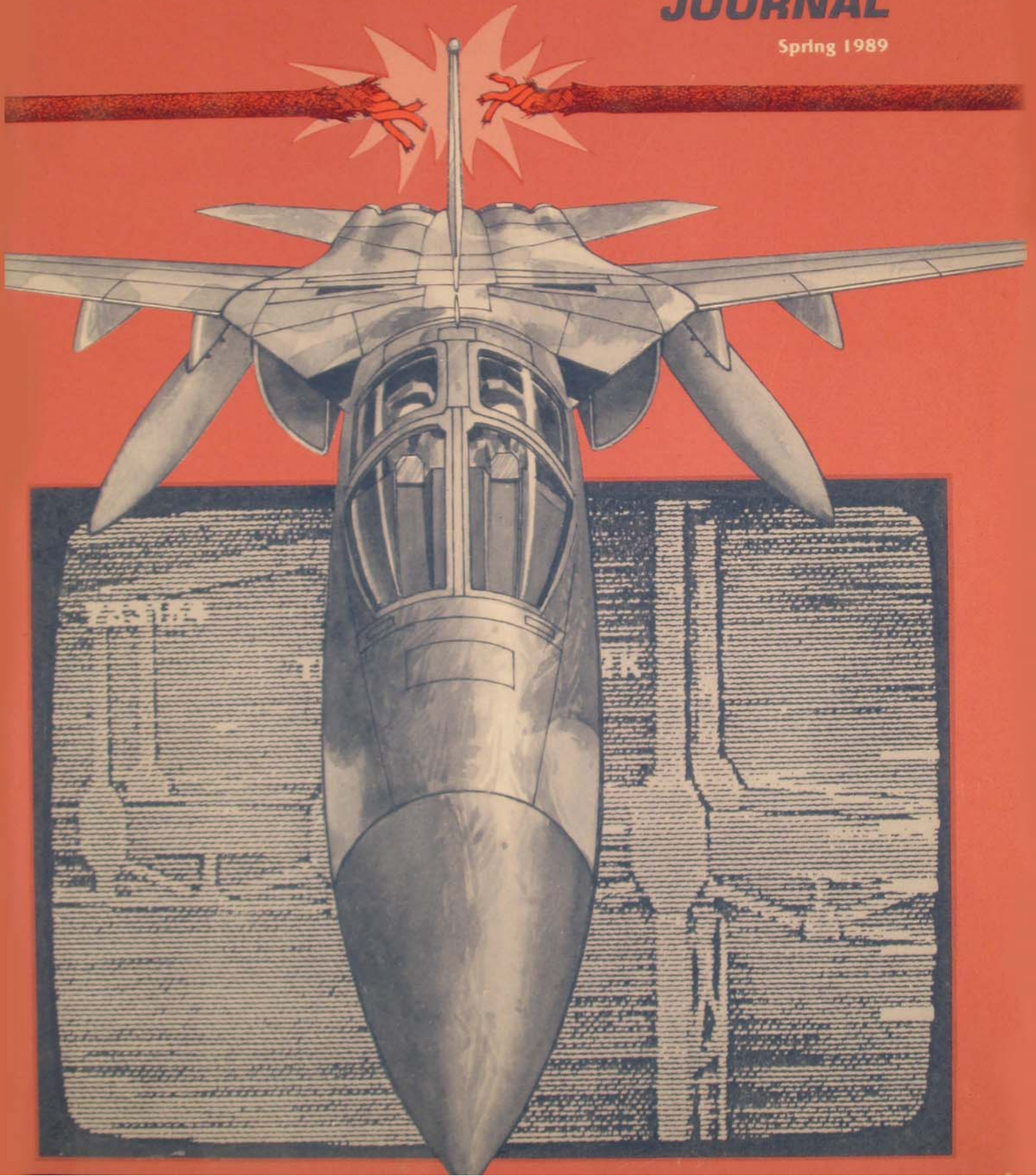


AIRPOWER

JOURNAL

Spring 1989



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EDITORIAL

A Magnificent Staff

There was a magnificent legal staff, a mechanism such as is possessed by every state before its political, economic, and moral collapse.

—Jaroslav Hasek
The Good Soldier: Schweik

THE quote refers, in a narrow sense, to the red-tape-encumbered administration of a 1914 Austro-Hungarian army detention barracks. It is not necessarily an indictment of the legal profession, nor of experts and expertise. It is not the railings of an old war-horse against the “rear-echelon SOBs” who do not have to endure the discomfort, fear, and chaos at the point of combat. It is a commentary.

Although good staffs are as essential to effectiveness as are any other activities, the quote is a telling exposition of the trap into which “magnificent staffs” can lead. It is an observation on the meaningless activity and goal-less processing to which staffs can become oriented in both peace and war. It is a lamentation of the all-too-familiar phenomenon of a rigidly structured, regulation-ridden, tunnel-visioned emphasis on process and “proper” procedure to the detriment of an overall end product. It speaks to a lack of vision of and an obliviousness to the ultimate objective to which the varied and individual mechanisms of an organization should contribute. It describes what usually happens when the parts of the whole become so specialized and narrowly oriented that perfect form in functional activity assumes the attributes of an end product. When that occurs, real goals become all but invisible to most of us.

It is a trap, by the way, that is not reserved for headquarters and other staffs. It is an equal opportunity pitfall that awaits any who have a tendency to lose sight of overall goals. (And who among us does not fall prey to this foible?) We all have seen manifestations of the highly intricate organizational structure within which the emphasis on part-tasks has replaced an appreciation of what the organization is all about: the absence of the “regular crew chief” to answer a question, the overgeneration of operationally ineffective sorties, the airlift deployment loads closed in no particularly usable sequence, the abundance of software-illiterate “clerks” of all ranks manning personal computers, and the flexible military leave form that can be flexibly used only in a few constrained circumstances.

Are we therefore destined to live out our professional lives, slogging away in a morass of activities, accepting the literary floggings served out by journal editors and other sage observers? No, we are not. The preventative is easy to prescribe, often difficult to swallow. Since any system is driven primarily by the individuals who people it, the remedy simply requires that each of us assess our actions and activities in light of the intended result. This does require us to stretch beyond *what* to *why*, and it requires that a mentor take the time to instruct us on the *why*. But this puts all of us in a position to ask, “Did I contribute today, not to the number of legal cases processed, nor to the production of sorties, nor to the number of patients seen, but did I contribute to the mission that those indicators support?” If so, then bask in a feeling of satisfaction; if not, then ask, “Why am I here and what am I really supposed to be doing?” KWG

ricochets

Letters to the editor are encouraged. All correspondence should be addressed to the Editor, Airpower Journal, Walker Hall, Maxwell AFB AL 36112-5532. We reserve the right to edit the material for overall length.

STRATEGIC LITERACY

No doubt about it—Lt Col G. Murphy Donovan knows how to express himself exceedingly well. His "Strategic Literacy" in your Winter 1988 issue touched on a subject near and dear to the hearts of those of us determined to add to the body of military writings. Although Colonel Donovan's linguistic gymnastics sometimes bordered on being a little too "cute," enhanced with more than just a hint of apparent bitterness, these detracted little from the significance of his article.

Since much of Colonel Donovan's theme is impinged upon significantly by the "jointness" of our armed services, I asked the commander of my joint command (a Navy flag officer) and our chief of staff (an Army O-6) to share their thoughts about the article. They agree that Colonel Donovan's concerns regarding the level of professional military writings on strategic thought are applicable to each of the military services. They also share my view that Colonel Donovan has perhaps attributed too much significance to the security and command review aspects of the issue.

It seems to me that, with few exceptions, rising stars in the military community often find little time during an active duty career to engage in rigorous, thought-provoking literary discourse on strategy. It's just a fact of professional life that we perceive ourselves as being too busy keeping our warfighting machinery "leaning forward in the trenches" in anticipation of the unanticipated. As a result, strategic thought tends to wait until retirement before being put to paper. I place no particular value judgment on this but merely note it.

The exceptions to this generality include those of us who enjoy one-year sabbaticals as research fellows, war college students, and the like. Another exception may be those assigned

as faculty at the service academies and war colleges, although it's been my observation that there is a dearth of strategic writings from this source. Still others likely include officers whose duties involve intelligence or similar research study—much like Colonel Donovan's duties. The number of officers in these or related positions at any point in time is, however, tremendously small. This fact, in my view, diminishes somewhat the significance of Colonel Donovan's observation that only ".003 percent of all active duty Air Force officers" are likely to write for publication.

After 23 years of service, I well appreciate the frustrations produced by the seemingly endless bureaucratic morass and documentation review processes that exist in today's Air Force. But I am not so cynical as to believe that some sort of institutional conspiracy or even an organizational lethargy exists to stop the flow of professionally relevant writings on military strategy. On the contrary, if Colonel Donovan's relatively low figure of 10 percent clearance denial for journal articles is to be generalized, then I'd consider that at least a preliminary indication that the system is working somewhat reasonably. Of course, this does not address the level of dilution the other 90 percent might have suffered in order to be cleared.

As for the supervisory and command "censorship" addressed by the author, my experience and that of others with whom I'm familiar regarding this aspect of publication review have generally been of a positive nature rather than a negatively inhibitive one. In the vast majority of the times, my superiors have reviewed my manuscripts and offered suggestions based on their more extensive real-world experiences and considered ideas; the resultant document proved not only vastly more publishable, but also significantly more scholarly in terms of level of contribution to our profession of arms.

Having said all this, however, it remains essential to the integrity of our profession that, as Colonel Donovan admonishes, we recognize the dynamic but inseparable nature of both the real-

Continued on page 65



AIR INTERDICTION

COL CLIFFORD R. KRIEGER, USAF

air interdiction—air operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces, at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required.

*—Department of Defense Dictionary of
Military and Associated Terms*

LIKE, counterair operations, air interdiction (AI) is a classic air mission. It appeared during World War I and came into its own during World War II. Over the last 70 years, air interdiction campaigns have had varying degrees of effectiveness. Air interdiction was an important factor in preparing for the Allied invasion at Normandy in 1944; however, its usefulness to the Allied effort in Italy was limited because it was conducted in isolation from the land campaign. In recent years, the Israeli air force has had mixed results with AI. Despite the fact that air interdiction is a classic air mission, it is little

studied and thus little understood. Few people know what it is and what it can and cannot do. This lack of understanding has led to errors at the highest levels, adversely affecting the conduct of air interdiction. The danger for the future is not that resources will be wasted on AI but that, because of mismanagement, its potential will be ignored or perhaps even lost. Against a strong and offensively oriented opponent, such as the Warsaw Pact, AI must be employed as effectively as possible.

Commanders have a natural desire to command and control those external forces (e.g., air forces) that they depend on for sup-

port. This inclination is in accordance with the basic principle of unity of command. However, two considerations mitigate against that approach. First, commanders cannot continue to add units to their purview without eventually diluting their ability to provide command and control for each one. Second, at some point commanders will find that they do not possess the expertise needed to give close attention to the detailed technical structure of each organization. Although overextending the span of control is a less serious concern with homogeneous units, technical diversity can quickly become a problem. A third issue—the ability of a senior commander to quickly provide new objectives for certain highly

fungible forces—will not be discussed in this article.

The air interdiction campaign is not an independent air operation but complements the efforts of friendly surface forces in achieving the objectives of the theater commander in chief (CINC). Like the campaigns of the surface component commanders, the AI campaign is structured to fulfill the theater CINC's overall objectives. In view of the common perception that an air interdiction campaign is designed to enhance the effectiveness of the land component commander, it seems strange to talk about conducting the campaign according to the theater CINC's objectives. These objectives are important because of the CINC's apportionment decision, which determines the total expected air effort and assigns forces that should be devoted to various operations for a given period of time.¹ The US Air Force has long maintained that it is the prerogative of the unified or joint commander to apportion air effort to counterair, air interdiction, and close air support.² Thus, from day to day the theater CINC can increase or decrease the amount of effort applied to the air interdiction campaign. The air component commander (ACC) recom-

mends the air apportionment to the theater CINC and thereby strongly influences the final decision. In fact, the views of all the component commanders must be considered.⁴ At the very least, the theater CINC prescribes the size of the air interdiction campaign and indirectly determines how it is executed. The CINC or a higher authority may also provide more definitive direction about what the air interdiction campaign should accomplish and what may or may not be done.⁴

Because the construction of an AI campaign appears to be straightforward, many people are tempted to meddle in the planning. A number of individuals want to have their hands on the air power throttle—from senior government leaders concerned about the impact of target selection on world opin-

ion to supported surface commanders who feel that they will benefit if they are running the show. The conduct of the campaign requires the expertise and constant attention of both the commander and staff of the air component. Whether the decision to conduct an AI campaign comes directly from the theater CINC, the ACC, or as a request from one of the surface component commanders, the ACC should have responsibility for the mission. Air interdiction is a classic case for the use of mission-oriented command and control, sometimes called mission order tactics.⁵ This concept of command and control (see table), which stems from German military tradition as far back as Helmuth von Moltke, is designed to give the greatest freedom to the person who knows the situation and emphasizes initia-

Tenets of Mission-Oriented Command and Control

The superior

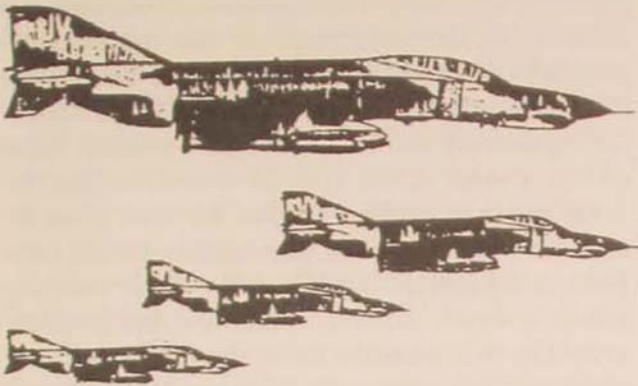
- determines the objectives to be achieved and to this end assigns a clearly defined mission.
- ensures that the forces, resources, and the authority required to accomplish the mission are available to the subordinate.
- lays down details only to the extent necessary for coordination within a broad scope. These details usually apply to the interaction with such forces and resources not subordinate to the person executing the mission or not immediately available to him.

The subordinate

- has extensive latitude in the way he executes the mission. He can use his own initiative to develop his operation plan and determine the necessary details. He has full discretion and freedom of action.
- remains—whatever he may do—committed to the substance of his mission and the concept of operations of the higher level of command. In carrying out his operation he never forgets the goals his superior is trying to attain. The Germans would say: "The mission is sacred to him."
- combines obedience with thinking in broader terms and a willingness to assume responsibility.

Source: *German Military Thinking: Selected Papers on German Theory and Doctrine*, Art of War Colloquium (Carlisle Barracks, Pa.: US Army War College, May 1983), 95–96.

tive at the lowest level. It thereby takes advantage of what the US military prides itself on—the initiative of the individual soldier, sailor, or airman.

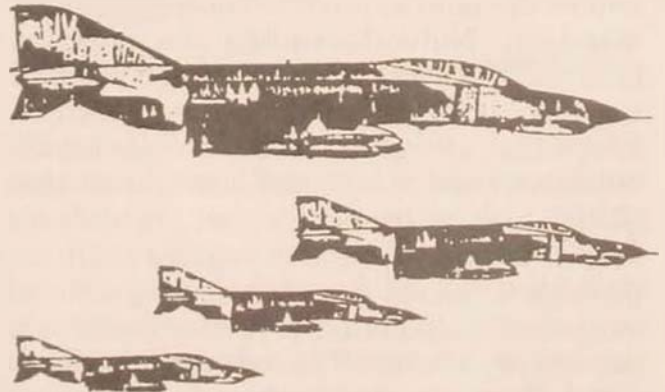


Mission-oriented command and control is missing in current discussions of air interdiction. Consequently, everyone who might receive some benefit from air interdiction wishes to have a say in how it should be done. The large number of cooks threatens to spoil the broth. Air interdiction must be conducted as a single campaign under the direction of one commander—the ACC—who should be held responsible for its execution. To do otherwise, given the limited air assets available, will fragment the effort and diminish effectiveness.

The air interdiction campaign delays, disrupts, diverts, or destroys enemy forces.⁶ It achieves one or more of these effects by conducting operations against a number of possible targets or target systems, including enemy combat units; transportation networks; command, control, and communications networks; combat supplies; or a combination of them. The specific form of an air interdiction campaign must be derived from the theater CINC's objectives, taking into consideration enemy threats and the opportunities for friendly action.⁷

The theater CINC's objectives for an interdiction campaign should be broad enough to permit the ACC latitude in meeting them. The CINC should identify these

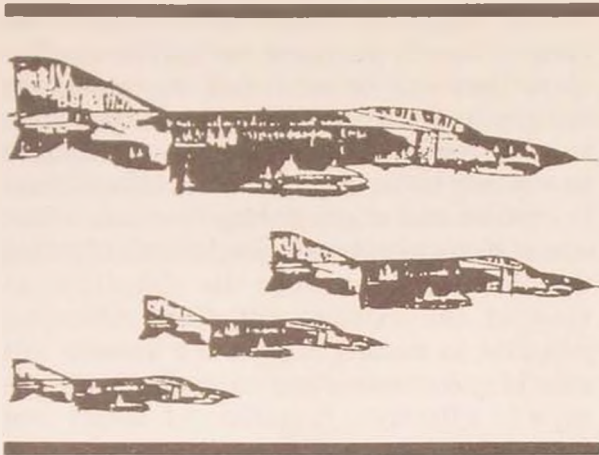
objectives in terms of desired outcomes rather than targets to be attacked or sorties to be flown. Although it may be easier to list targets or detail sorties, presenting the objectives in such terms cripples the planning process and results in a less effective overall air effort.⁸ Not only must ACCs know theater objectives but also they must know the objectives of the surface commanders so that they can provide them the best possible support and help them exploit the results of the AI campaign. Once the objectives are known, the air planners outline the various ways they can be achieved. An attack on bridges and road defiles may be possible, but—as our experience in Vietnam taught us—it may be far more effective to lay mines in harbors and attack docks. The issue is not one of hitting bridges or docks but of finding the best way to achieve the objectives, in view of the existing situation. Attacking supplies in dumps may be the answer, but attacking command and control nets may be equally effective. Selection of target systems should be coordinated with the surface component commanders to ensure that



destruction of these targets fulfills land and naval objectives. When reviewing potential targets, however, the air component commander must also consider the threat each one represents.

Enemy targets cannot be viewed solely in terms of the number of weapon systems involved. In addition to the types and prolifer-

eration of defensive radars, aircraft, missiles, and guns, the terrain and weather may also be factors. For example, terrain can be used to mask our attacking aircraft from ground-based radars, and atmospheric conditions can aid or hinder either the defender or the attacker. Further, ACCs have a number of options available to them to counter the existing threat and aid in mission planning. These include intelligence



assets and electronic warfare assets (e.g., defense suppression forces—those of the ACC and of the land and naval component commanders). Notwithstanding the effectiveness of electronic warfare assets, certain targets or target systems may be so costly to attack that alternate ways of achieving the objective need to be considered. More than likely, high-value targets that are well defended by the enemy will require a tailored package of attack forces including defense suppression, electronic warfare, and air-superiority aircraft. The nature of the threat may influence not only the selection of target systems but also the phasing and timing of attacks. For example, heavily defended bridges may call for sowing influence mines along rail lines in remote areas. Subsequent shifting of enemy defenses may then open up certain bridge targets for attack. The threat may also dictate friendly basing at extended ranges, which in turn requires integration of aerial refueling assets.

The ACCs must be alert to unique oppor-

tunities to apply air interdiction in especially effective ways. Often an AI campaign will resemble previous campaigns, but ACCs must examine all opportunities and exploit them when it is to their advantage. Such opportunities may be offered by the land component commander's scheme of maneuver, the campaign of the naval component commander, the enemy's situation, environmental factors, or the ACC's own existing condition. For example, enemy lines of communication may be very fragile, the weather may have shielded an area from attack or bogged down the enemy, or AI support of a Marine landing may divert enemy forces away from an impending Army offensive. On the friendly side, the range of available aircraft may allow large bomb loads to be carried to deep area targets (e.g., by F-111s) or may require the campaign to operate against pinpoint targets close to friendly bases (e.g., with F-4E PAVE TACK). Likewise, the pace of operations may be determined by limitations in either friendly supply or maintenance capabilities. Available intelligence may convince the ACC to attack critical logistics command, control, and communications nodes, thus disrupting movement of enemy reinforcements and supplies. If working with allies whose aircraft and munitions are second-rate, the ACC might use allied aircraft to attack soft targets on roads and rail lines and concentrate US air assets on defense suppression.

The task of the ACC and staff in the tactical air control center (TACC) is to tie all these and other factors together and produce a campaign plan to meet the theater CINC's objectives. This responsibility requires more than opening a copy of the *Joint Munitions Effectiveness Manual*. It requires a knowledge of the techniques and procedures involving fighter, bomber, and reconnaissance aircraft; the capabilities, limitations, and practices of supply and maintenance; and the tactical proficiency of various units. This expertise is gained through study and experience as airmen. Similarly, commanders and staff officers must be fully prepared for the conduct of air

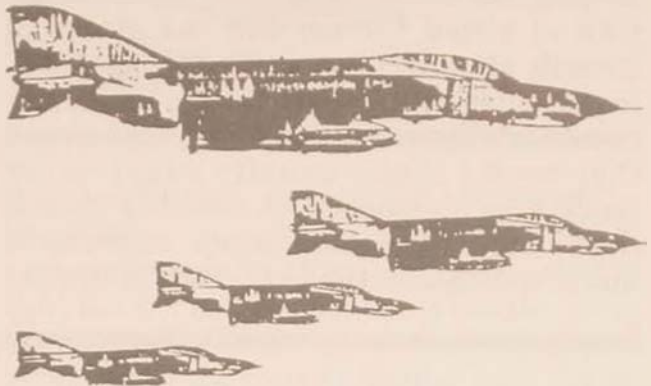
operations. Given the current limits on attendance at intermediate and senior service schools, Air Force personnel should take the time to pursue alternative educational opportunities.⁹ Staff officers must understand potential enemies—their doctrine, past military operations, strengths and weaknesses, as well as transportation networks and command, control, communications, and intelligence systems. Further, staff officers need to know the lessons learned from past air interdiction campaigns as well as the capabilities and limitations of manned and unmanned aerospace systems, the effects of weapons, and the doctrine of allied forces. This education, coupled with operational expertise and experience, will fully prepare commanders and staff for the conduct of theater air operations.

It is not enough that ACCs and their staffs be both smart and proficient. They must understand what surface forces can and cannot do. Further, they must know and understand the surface component commanders and their staffs. Electronic communications will not replace the value of speaking to each other. One of the best ways to encourage such communication is to collocate the headquarters of the component commanders. At the end of World War II, the US Ninth Air Force published an analysis of its operations in Europe. One comment in the *Condensed Analysis* is particularly germane:

One of the most significant lessons learned from tactical air warfare in the desert was that it was mandatory that air and ground cooperating headquarters function together in closest operational and physical unity. The practical step indicated by this thinking was that Ninth Air Force would have to form a mobile, compact operational headquarters which could keep pace with swiftest movement of the army group and could operate independently of the main administrative headquarters in the rear.¹⁰

When forces are operating in a major theater, collocation of headquarters should continue down the chain of command to at least numbered air forces and equivalent

surface component levels. If collocation is impractical, senior representatives must be exchanged. Placing junior liaison officers in each other's headquarters is not sufficient. Because these officers must represent their commanders at the other headquarters, they must understand how their commanders think. This capability requires skill and sensitivity that go beyond mere liaison. To a certain extent, the lack of such collocation is presently compensated for by collocating tactical air control parties (TACPs) and air support operations centers (ASOCs) with land unit headquarters, and ground liaison officers with Air Force combat wings. One idea under consideration within the US Air

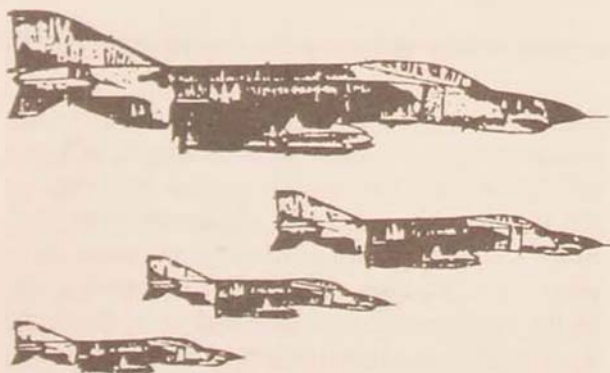


Forces in Europe (USAFE) is to provide brigadier general corps air liaison officers (ALOs) in wartime.¹¹ This idea is a step in the proper direction and, if Congress will allow the spaces, should be extended into peacetime as well. Such arrangements need to be continued and expanded to include equivalent representation at naval headquarters, when appropriate.

The surface component commanders assist the ACC by providing their requirements for air interdiction in terms of objectives and plans for achieving those objectives. When appropriate, they should also include recommended targets and target systems for air attack. The ACC then integrates the needs of the surface component commanders into the overall effort and con-

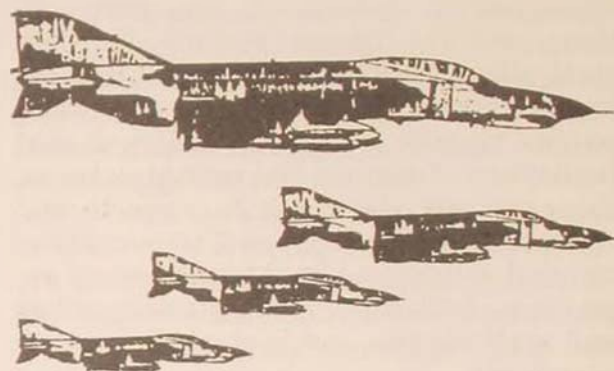
siders their target recommendations in formulating a plan. Whatever the decision, the ACC should coordinate the plan with these commanders and inform them of any changes.

Having developed an effective air interdiction campaign, the ACC cannot sit back and let it execute itself. As Gen Helmuth von Moltke pointed out, "No plan survives contact with the enemy."¹² The enemy is not an inanimate object but will react to our efforts and even initiate action that upsets our plans. Further, the ACC's ability to assign assets to the AI campaign varies daily according to attrition and variations in the war. No AI campaign can be static. The ACC must constantly review the campaign so that it responds to a number of factors, including the enemy threat, the surface situation of allied forces, and the status of friendly air power. In tracking enemy countermeasures, the ACC must have timely, accurate intelligence. Experience has shown that enemy forces usually adapt rather quickly to air operations directed against them. Sometimes the enemy response is quick, unexpected, and effective, as in 1943



when the Germans changed from night evacuation across the Strait of Messina to day evacuation. The Allied effort to cut off or destroy the German forces retreating from Sicily was thwarted by a failure to realize that the enemy had taken this risky step. Consequently, shifting Allied AI operations

from nighttime to daytime was delayed. Sometimes the changes are more subtle, as when the North Vietnamese ran cables across streams, placing wood planks on them when bridging was needed and taking the planks up again afterward.

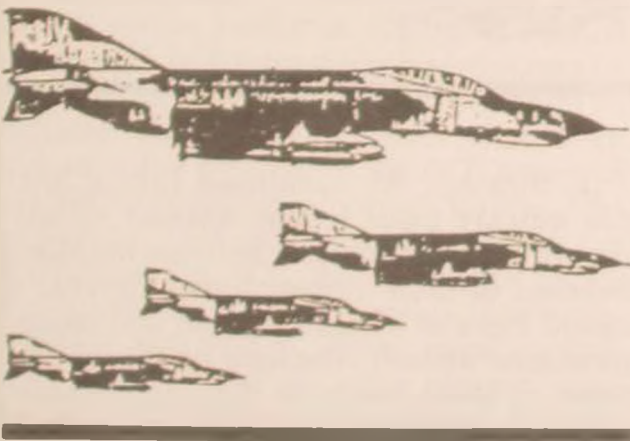


Intelligence should play three roles during the execution phase of the air interdiction campaign. First, it can provide up-to-date information to assist current operations. This data is critical for planning attacks on mobile targets. Although the ACCs should not make the campaign dependent upon the capabilities of real-time sensor systems, they should fully exploit the capabilities of these devices. Second, intelligence can indicate how the enemy is adapting to the campaign so that ACCs can respond appropriately. Third, intelligence can help analyze the effectiveness of the various parts of the air interdiction campaign, especially concepts newly introduced. Because they are at the center of both intelligence and air-status reporting, ACCs are best able to revise the campaign as necessary and thereby achieve the theater CINC's objectives. Further, based on the intelligence available, the expertise of the ACCs, the competence of their staffs, and the progress of the air interdiction campaign, the ACCs are able to recommend changes in immediate and near-term plans to the surface component commanders.

After examining theater objectives (in-

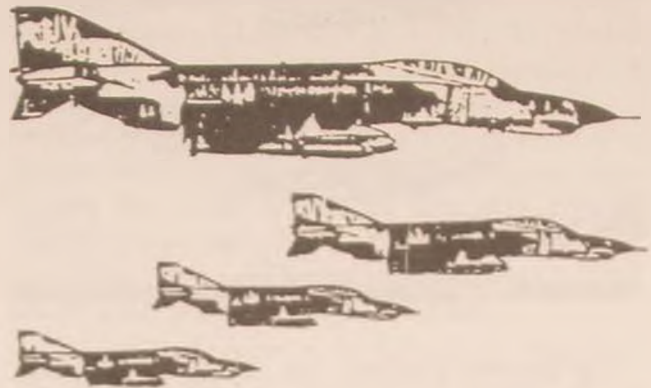
cluding the objectives of the surface component commanders), threat characteristics, and capabilities/limitations of friendly forces, the ACC determines the targets and, if necessary, tailors the attack packages. In accordance with mission-oriented command and control, however, participating units along with individual flight leaders and aircrews select appropriate tactics, techniques, and procedures. This process results in the best use of initiative and the most efficient use of expertise at the proper level. Further, because subordinate air commanders understand the objectives of air interdiction, they can continue the campaign despite interruptions in communications with higher headquarters. That is, they do not have to receive a daily Air Task Order to continue combat operations. Moreover, aircrews can rely on their training and expertise to conduct armed reconnaissance operations when so tasked and to attack targets of opportunity when so authorized.

Air interdiction not only assists a surface component commander by reducing the enemy's ability to reinforce and maneuver, but also it helps the commander and subordinates maneuver to defeat enemy forces. For example, a land-force commander, perform-



ing at what the Army calls the operational level of war, fights battles of maneuver (fire and movement). In planning and fighting the campaign, the commander needs the cooperation of air power. That cooperation

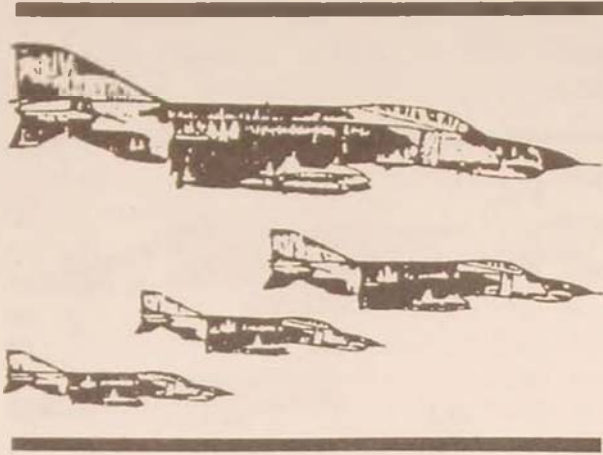
could take the form of counterair operations, air interdiction, close air support, air reconnaissance, or tactical airlift. When a particular scheme of maneuver requires air interdiction, both air and land forces must be closely coordinated. Diversion of air power or the delay of Army defense suppression or unit movements will disrupt



the overall effort and put the success of the undertaking at risk. Any changes in air interdiction must be closely worked out with the land commander. Similarly, any changes in the land commander's scheme of maneuver must be coordinated with the air commander.

The other side of mission-oriented command and control is that the superior—the theater CINC—ensures that forces, resources, and the authority required for accomplishment of the mission are available to the responsible subordinate. Although the assets are in theater due to previous service programming and the wartime execution decisions based on apportionment of forces in the Joint Strategic Capabilities Plan (JSCP), the theater CINC determines where the forces will be used and for what purpose. The CINC is responsible for the theater strategy and sets the objectives. This determination of priorities can make or break an air campaign. If the CINC directs the ACC to give priority to counterair and close-air-support operations, this decision will limit the assets available for air interdiction. If the CINC directs the ACC to con-

duct major air efforts in several areas within the theater, this action may dilute the effectiveness of air power and prevent a unified effort.



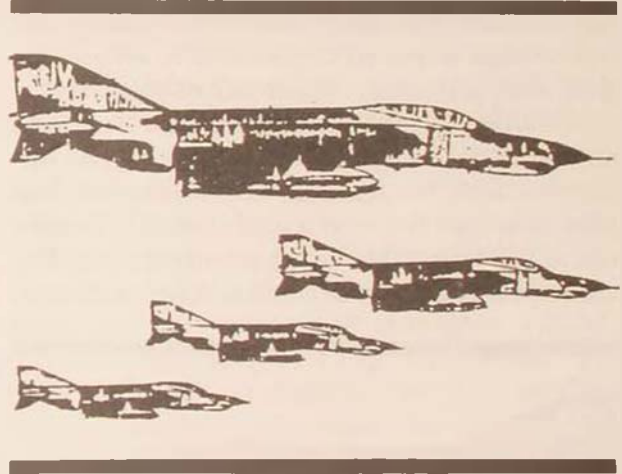
To ensure proper use of resources, the theater CINC provides forces to the people who can best use them to achieve theater objectives. Consequently, the air component commander is responsible for all air assets, including the limited number of specialized aircraft. Within mission-oriented command and control, the concept of centralized planning and decentralized execution is applicable to the air interdiction campaign. There are two reasons for centralized planning and decentralized execution: limited assets and the efficient application of those assets. The ACC must usually operate with less than the desired numbers and types of forces. Further, the speed, range, and flexibility of air assets require centralized planning.

For example, in early World War II when the Allies fought with limited resources, centralized control with decentralized execution was essential for successful operations. Although these assets were capable of doing a variety of missions, priorities had to be set. Granted, the speed and range of air power gave the commander flexibility in deciding where and when to use it. But if air assets were committed in penny packets to meet the needs of many parties, they accomplished little, and air strength was quickly

dissipated. The same situation obtains today. To try to operate an air interdiction campaign by parceling out air assets to various surface commanders means that sufficient forces and resources necessary to do the job will not be available. In effect, the principles of mass and economy of force will be violated.

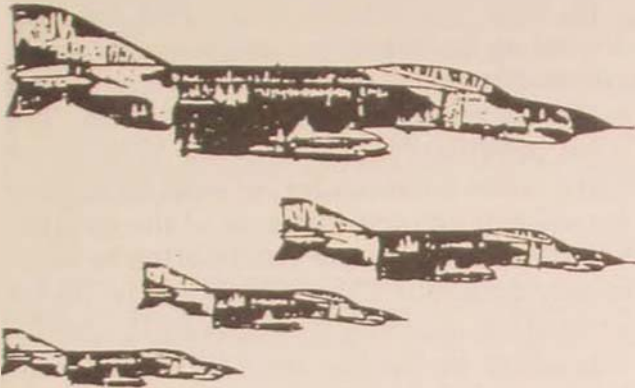
The various services, commands, and agencies have roles to play in all military operations we conduct today. Certain assets can play a vital role in the AI campaign even though they do not belong to the ACC. Five types come to mind:

(1) National Intelligence Assets. Intelligence resources may meet the needs of more than one theater. They should be controlled at the national level, but tasking might be delegated if communications allow.



(2) Strategic Air Command (SAC). SAC can quickly place a large amount of ordnance on a target and can increase the effectiveness of other forces. It can provide a mixed force of bomber, tanker, and reconnaissance aircraft. Because of the importance of these assets in deterring nuclear war, operational command has remained with CINCSAC.¹³ We now recognize, however, that responsibility for control of these aircraft should pass to the theater commander so that targeting, allocation, tasking, and execution of these assets will be in the hands of the person who knows what is

going on.¹⁴ We have yet to acknowledge that the responsibility should belong to the air component commander rather than the theater CINC. Under a new concept presented at the 1988 US Air Force Aerospace Power Symposium, SAC proposed that a



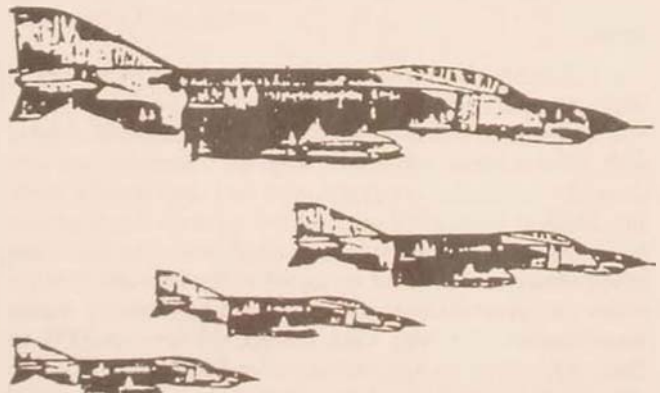
strategic area of responsibility (SAR) be designated within a theater and that SAC forces operate in that SAR under what amounts to mission-type orders.¹⁵ The SAR would be an area accessible only by heavy bomber or principally by this aircraft.

(3) Naval Air. Depending on the theater CINC's objectives and the state of battle, the naval component commander may have carrier sorties available. Similarly, Marine air-ground, task-force aircraft sorties may be available. If the overall theater situation so dictates, these excess sorties should be placed at the disposal of the ACC's control system for targeting, allocation, tasking, and execution. This recommendation does not imply that the ACC should control all air operations of the naval component commander. Far from it. When naval component commanders are using organic naval air to conduct the naval campaign, they are in the best position to understand its capabilities/limitations and to integrate it with surface and subsurface operations. In fact, the ACC cooperates with the naval component commander in fulfilling theater objectives. This cooperation is in addition to that provided by the ongoing counterair and air

interdiction campaign (e.g., assisting with defensive operations at sea). When the naval component commander has organic air capability and associated command and control capabilities—as in an amphibious operation—the ACC provides the air effort, including targeting, allocation, tasking, and execution. ACCs support naval component commanders who have no organic tactical air (e.g., commander, Naval Forces Southern Europe—COMNAVSOUTH) in much the same way they provide close air support to land component commanders.

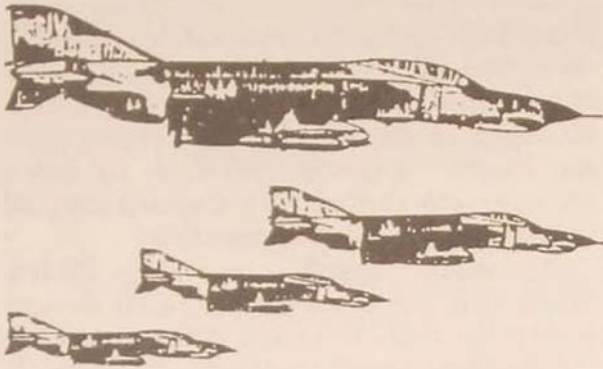
(4) Special Operations Forces (SOF). When SOF forces are operating in an area where the ACC is conducting AI and are conducting operations applicable to the AI campaign (e.g., gathering intelligence), they should be part of the ACC's effort.

(5) Army Weapons. As the Army employs weapons with ranges upward of 200 kilometers (km), it becomes clear that those systems need to be closely integrated into the air interdiction campaign to take advantage of their extreme range. The ratification of the Intermediate-range Nuclear Forces (INF) Treaty will soon remove ground-



launched missile systems with ranges exceeding 500 km, but other long-range systems remain in the Army inventory or can be procured.¹⁶ The question of command and control of surface-to-surface missiles becomes more important as technology makes them effective participants in non-

nuclear counterair and air interdiction campaigns. Logically, control of targeting,



allocation, tasking, and execution for such weapons belongs to the commander responsible for the overall direction of a particular campaign. If these systems are not integrated into the AI campaign, it is possible that they might inadvertently destroy friendly aircraft. For example, if timing is

particularly bad, a Lance missile could conceivably arrive at the very moment that AI aircraft are delivering their ordnance. At the very least, these weapons should be closely integrated with the ACC's tasking because no one would conduct close air support without closely integrating it with the land force's scheme of fire and maneuver.

In sum, air interdiction must be conducted as an integrated campaign by a single commander who has the tools and authority to accomplish the mission. The ideal candidate for conducting AI is the air component commander because this officer commands or controls most of the applicable assets and has the information to make timely decisions. The ACC should be the coordinating authority for the overall interdiction effort in the theater and must always keep in mind the objectives assigned by the theater CINC. Mission-oriented command and control is fully applicable to air interdiction, and not until it is rigorously applied will we be able to gain the maximum benefit from our efforts. □

Notes

1. JCS Publication 1, *Department of Defense Dictionary of Military and Associated Terms*, 1 June 1987, 32.

2. Exchange of letters between Gen J. P. McConnell, chief of staff, US Air Force, subject: Concept for Improved Joint Air-Ground Coordination, 19 March 1965, and Gen Harold K. Johnson, chief of staff, US Army, subject: Concept for Improved Joint Air-Ground Coordination, 28 April 1965. The discussion of apportionment is found on page 5 of the concept. This position on apportionment was confirmed by a jointly signed memorandum of 23 May 1981, subject: US Army and US Air Force Agreement on Apportionment and Allocation of Offensive Air Support (OAS)—Information Memorandum—signed by Lt Gen Glenn K. Otis, GS, deputy chief of staff for operations and plans, and Lt Gen Jerome F. O'Malley, US Air Force deputy chief of staff, plans and operations.

3. As an example of evaluating the needs of all components, consider a hypothetical discussion in the NATO war headquarters in northern Italy, where the component commanders or representatives are commander, Land Forces Southern Europe (COMLANDSOUTH); commander, Five Allied Tactical Air Force (COMFIVEATAF); commander, Naval Forces Southern Europe Representative (COMNAVSOUTH REP); and commander, Striking and Supporting Forces Southern Europe Representative (COMSTRIKEFORCESOUTH REP). At some

point in the war, COMLANDSOUTH may turn to the COMNAVSOUTH REP and ask why ships with a resupply of artillery shells have not yet left Gibraltar. The COMNAVSOUTH REP would turn to the COMSTRIKEFORCESOUTH REP and ask when carrier battle groups will be available to clear the path. The response might be that commander in chief, Southern Europe (CINCSOUTH) has directed the carriers to support the battle in Greek-Turkish Thrace. At that point the COMNAVSOUTH REP might turn to COMFIVEATAF and ask about tactical air support of maritime operations (TASMO), only to be told that land-based air has been totally committed to providing support to COMLANDSOUTH. At this point the COMNAVSOUTH REP turns to COMLANDSOUTH and says, "If you want your resupply, you need to decrease your immediate demands for air support for two days, so Five ATAF can provide TASMO for my supply convoy." Although this case is hypothetical, it points up the need for mutual understanding among component commanders.

4. An example of restricting an air interdiction campaign is the initial limitation on operations against transportation targets during the preparation for the Normandy invasion. Prime Minister Churchill directed that the only targets to be attacked were those where French casualties were unlikely to exceed 150. This limitation was quickly dropped, however, after at-

tacks produced relatively few casualties. Hilary St. George Saunders, *The Fight Is Won*, vol. 3 of *Royal Air Force 1939-1945* (London: Her Majesty's Stationery Office, 1954), 87.

5. *German Military Thinking: Selected Papers on German Theory and Doctrine*, Art of War Colloquium (Carlisle Barracks, Pa.: US Army War College, May 1983), 94.

6. The meaning of air interdiction cited earlier differs somewhat from the current Department of Defense definition of interdiction: "An action to divert, disrupt, delay or destroy the enemy's surface military potential before it can be used effectively against friendly forces." JCS Publication 1, 191. This definition closely parallels the view in Air Force basic doctrine that successful air interdiction "can delay the arrival or buildup of forces and supplies, disrupt the enemy's scheme of operation and control of forces, divert valuable enemy resources to other uses, and destroy forces and supplies," AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*, 16 March 1984, 3-3 and 3-4.

7. AFM 1-1, 2-10 and 2-11.

8. If the theater CINC goes beyond apportionment of air effort or if a component commander wishes to detail how support should be provided, either officer immediately becomes involved in the detailed planning of the air effort. Commanders cannot simply translate air effort into sorties. For example, in NATO's Central Region of Allied Command Europe (ACE), an Alpha jet sortie represents a limited bomb load at short range with little electronic self-protection. On the other hand, an F-111 represents a large bomb load delivered at considerable range with significant electronic self-protection. Once commanders decide to take on the allocation and tasking function, they must assume the entire function; otherwise, some, if not all, missions will not be performed at optimum levels.

9. We will have to develop the instruction that we need. Joint professional military education (PME) does not have time to teach the issues of AI planning in the TACC or in an equivalent allied headquarters. Even Air Force PME does not now have time to teach this material, and the reduction of Air Command

and Staff College to a half-year course will further exacerbate the problem. Further, officers assigned to a TACC or to an overseas equivalent have not attended PME in residence. Although both the Air Ground Operations School (AGOS) and the Combined Air Warfare Course (CAWC) provide pieces of the puzzle, we need in-depth instruction in air war. That includes not only organization charts and command, control, communications, and intelligence (C²I) flow, but also targeting, weapons effects, sortie generation, the enemy approach to war, and the history of air power from an applications point of view. This last topic may be the most difficult to teach.

10. *Condensed Analysis of the Ninth Air Force in the European Theater of Operations* (1946; new imprint, Washington, D.C.: Office of Air Force History, 1984), 57.

11. The USAFE plan is to provide general officer liaison during war by committing Tactical Air Command air division commanders as corps air liaison officers. This action will, for the first time, provide a level of liaison that shows the serious nature of the Air Force's commitment to the corps commander. Although the general officer ALO may lack direct experience when he deploys, the permanent colonel ALO will make up for any shortcomings. The general officer ALO will ensure access to the highest councils of war within both the Air Force and Army camps.

12. Robert Debs Heinl, Jr., *Dictionary of Military and Naval Operations* (Annapolis, Md.: United States Naval Institute, 1966), 239.

13. Gen William W. Momyer, *Air Power in Three Wars* (Washington, D.C.: Government Printing Office, 1978), 99-107.

14. "Integrating Strategic and Tactical Air Power in Conventional Warfare," US Air Force Aerospace Power Symposium, Maxwell AFB, Ala., 2-4 March 1988.

15. *Ibid.*

16. Systems that operate beyond 500 km are allowed under the INF Treaty, but because they operate at such extreme ranges, they are considered part of a different concept for the application of air power.

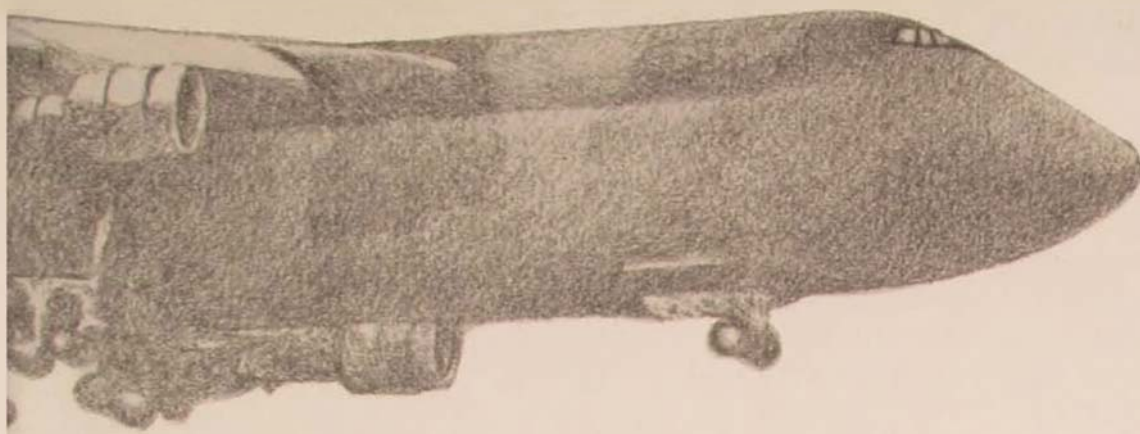


OPERATION NICKEL GRASS

Airlift in Support of
National Policy

CAPT CHRIS J. KRISINGER, USAF

ON 6 October 1973, while the state of Israel observed the Jewish holy day of Yom Kippur, war burst upon the Middle East. Egyptian and Syrian forces struck simultaneously against the frontiers of Israel in what would be the fourth Middle East war in 25 years. In his book *The Arab-Israeli Wars*, Chaim Herzog commented that the attack was the equivalent of the NATO forces



in Europe being flung against Israel.¹ Attacking in midafternoon, Egyptian forces crossed the Suez Canal at three points and moved into the Sinai Peninsula while, to the northeast, Syrian troops overran Israeli-occupied positions in the Golan Heights. After initial Arab successes, the Israeli Defense Forces (IDF) held and by 10 October counterattacked, first in the Golan Heights area, where they drove to within 30 miles of Damascus, and a week later in the Sinai, where they eventually pushed the Egyptians back across the Suez Canal.

The ferocity of the combat severely depleted the equipment and military stockpiles of both sides, and the need for resupply became urgent. The Soviets responded to requests from Egypt and Syria and, while US observers looked on with growing apprehension, began airlifting military supplies into those countries aboard An-12 and An-22 transport aircraft.² The United States delayed the resupply of Israel to conduct diplomatic negotiations with Moscow to restore peace in the area; however, it became apparent that those talks would succeed only by reestablishing the military balance through a massive resupply of war materiel to Israel.

US officials considered various delivery methods that did not require military airlift forces to enter the war zone.³ They rejected sealift because the prohibitively long time necessary for delivery would fail to meet Is-

rael's urgent requirements. Airlift was the only viable alternative, and plans were quickly drawn to accomplish the necessary resupply. On 13 October President Nixon made the decision to begin the airlift, and on the following day the first US military transport, a C-5, landed at Lod International Airport, Tel Aviv. The American airlift, dubbed Operation Nickel Grass, was under way.⁴

By midnight on 14 November, one month later, the United States completed an airlift of immense proportions—an effort that played a decisive role in preventing the defeat of Israel.⁵ Although less publicized than the belligerents' combat operations, the aerial resupply efforts of Operation Nickel Grass were significant. For the United States, Nickel Grass had far-reaching political and military effects. From a broad perspective, the airlift may even have been as important as the Western allies' airlift that broke the Berlin blockade in 1948–49.

Militarily, the Israeli airlift was significant because it offset the Soviet airlift to Egypt and Syria, it overcame Israel's critical shortage in certain military items, and it strengthened Israel's overall military position. For the US Air Force, Nickel Grass was an important milestone in developing its ability to project and resupply forces with an all-jet transport fleet over intercontinental distances. In particular, the operation put the C-5 Galaxy to its first real test as the

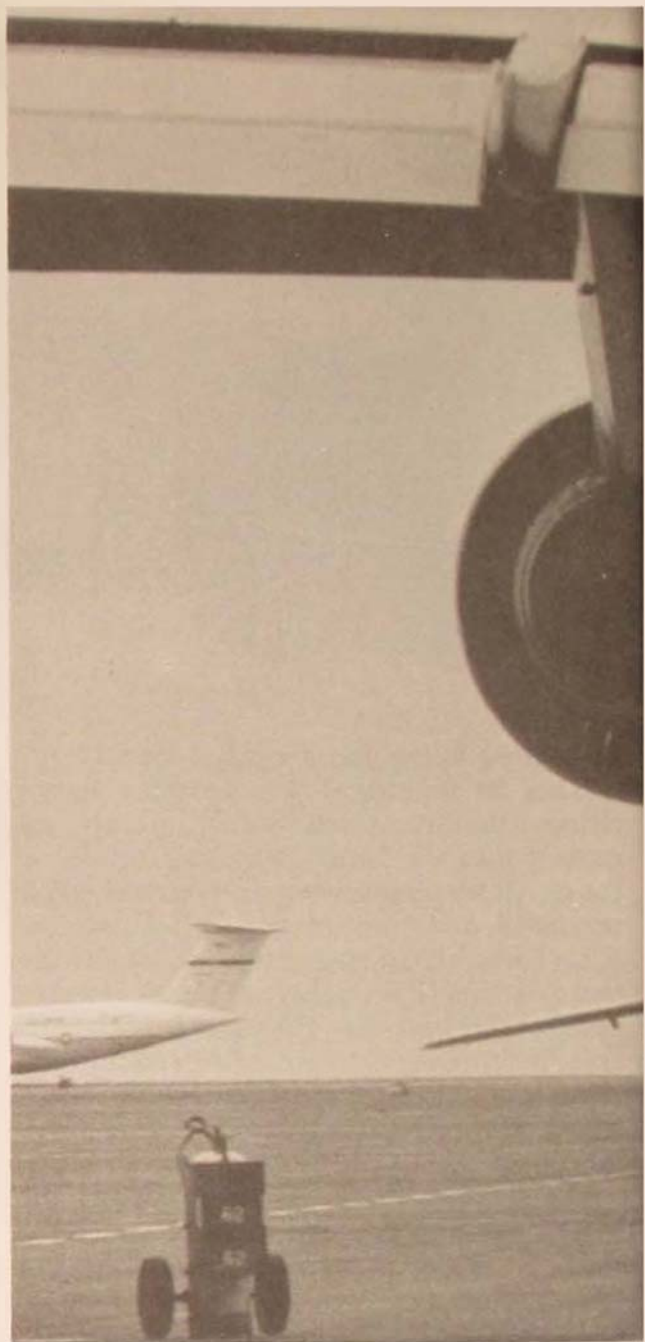
C-5 aircraft unloading at Lajes Field in the Azores. Lajes was a critical location because most European nations refused to permit overflight or en route landing of aircraft supporting Operation Nickel Grass. Lajes handled 30 to 40 flights per day.

world's largest intercontinental airlifter. The events of Nickel Grass also provided the impetus for several significant enhancements to the airlift capability we know today: air refueling for airlift aircraft, upgrades in command and control, and realignment of airlift assets under Military Airlift Command (MAC).

Despite its military importance, the airlift probably had an even greater political impact because of the effects that extended beyond the immediate scope of the Arab-Israeli conflict. The political ramifications involved not only the relationship of the United States with Israel but also with the Soviet Union, the Arab countries (particularly Egypt), and NATO members. The success of the aerial resupply also supported the contention that airlift may be among the most flexible options available to the national command authorities (NCA) for the execution of national policy during peace or war.

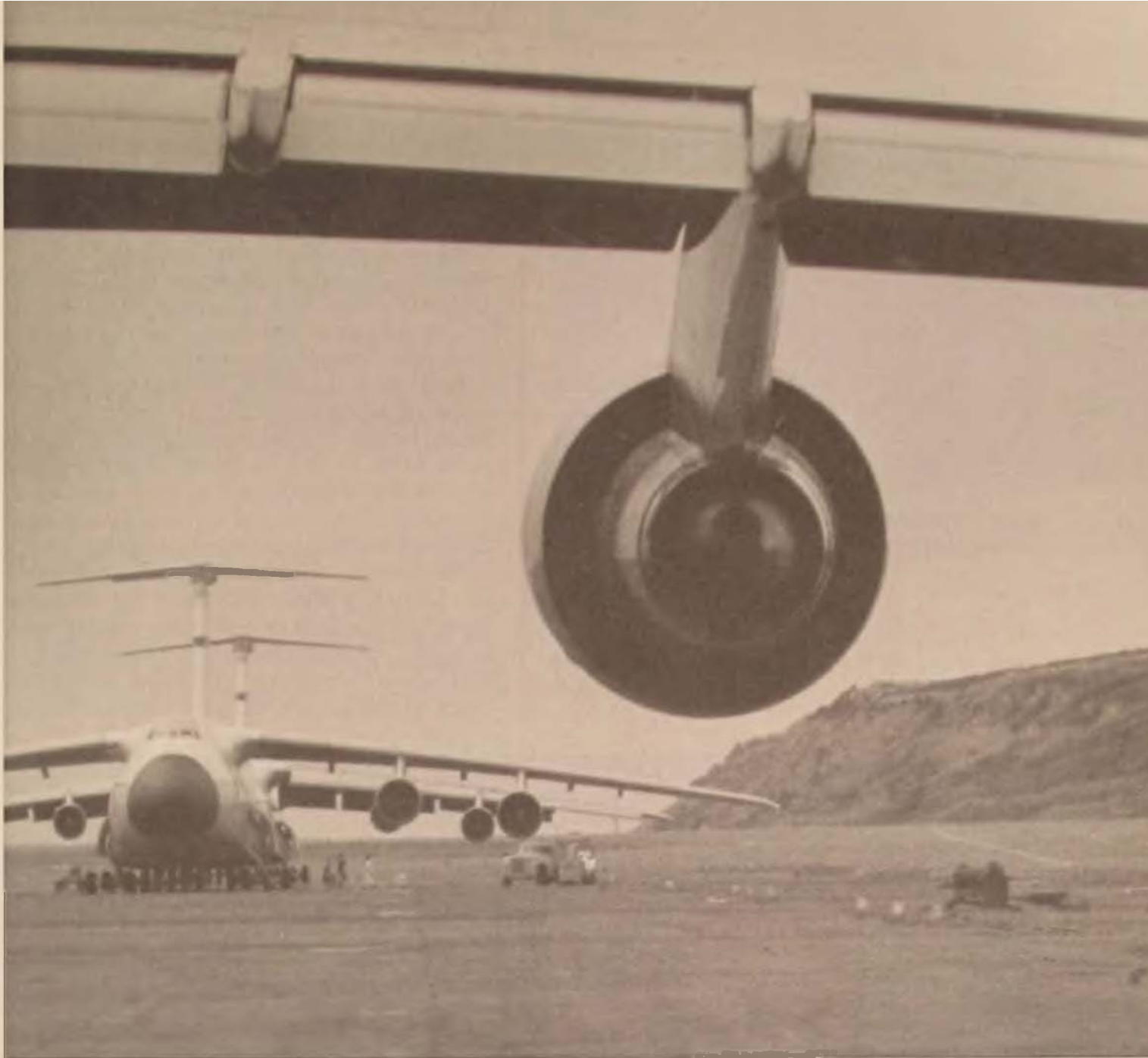
Policy before Planes

The Israelis called for American aid almost immediately after the Egyptian army crossed the Suez Canal. Their request was denied on 7 October because of a consensus within the Nixon administration that "they didn't really need the equipment" and that they didn't suffer from shortages of materiel.⁶ Officials in the administration, most prominent among them Secretary of State Henry Kissinger, also believed in an inevitable Israeli victory with or without resupply. Additionally, some people did not want to antagonize the Arabs because we depended upon them for some of our oil. Large oil companies warned against aid to Israel, fearing that the flow of oil would be



halted—particularly to countries even more dependent on Arab oil than the United States.⁷ Also at stake was our status as a broker in the peace negotiations going on with the Soviets and with various Middle Eastern countries.

Regardless of these concerns, the US government found that maintaining the balance of power in the region was closely tied to the survival of Israel. Surprisingly, the United States was under no treaty obligations or formal protocols to supply Israel. Our commitments derived from a series of



White House policy pronouncements issued by five successive presidents dating back to Harry S Truman. These pronouncements indirectly linked the territorial integrity of Israel to the national security interests of the United States within the greater framework of peace and stability in the Middle East.⁸ Moreover, under the Nixon Doctrine, the United States favored support to friendly countries by providing the military equipment and supplies needed for self-defense.⁹

For Israel, resupply did not come as

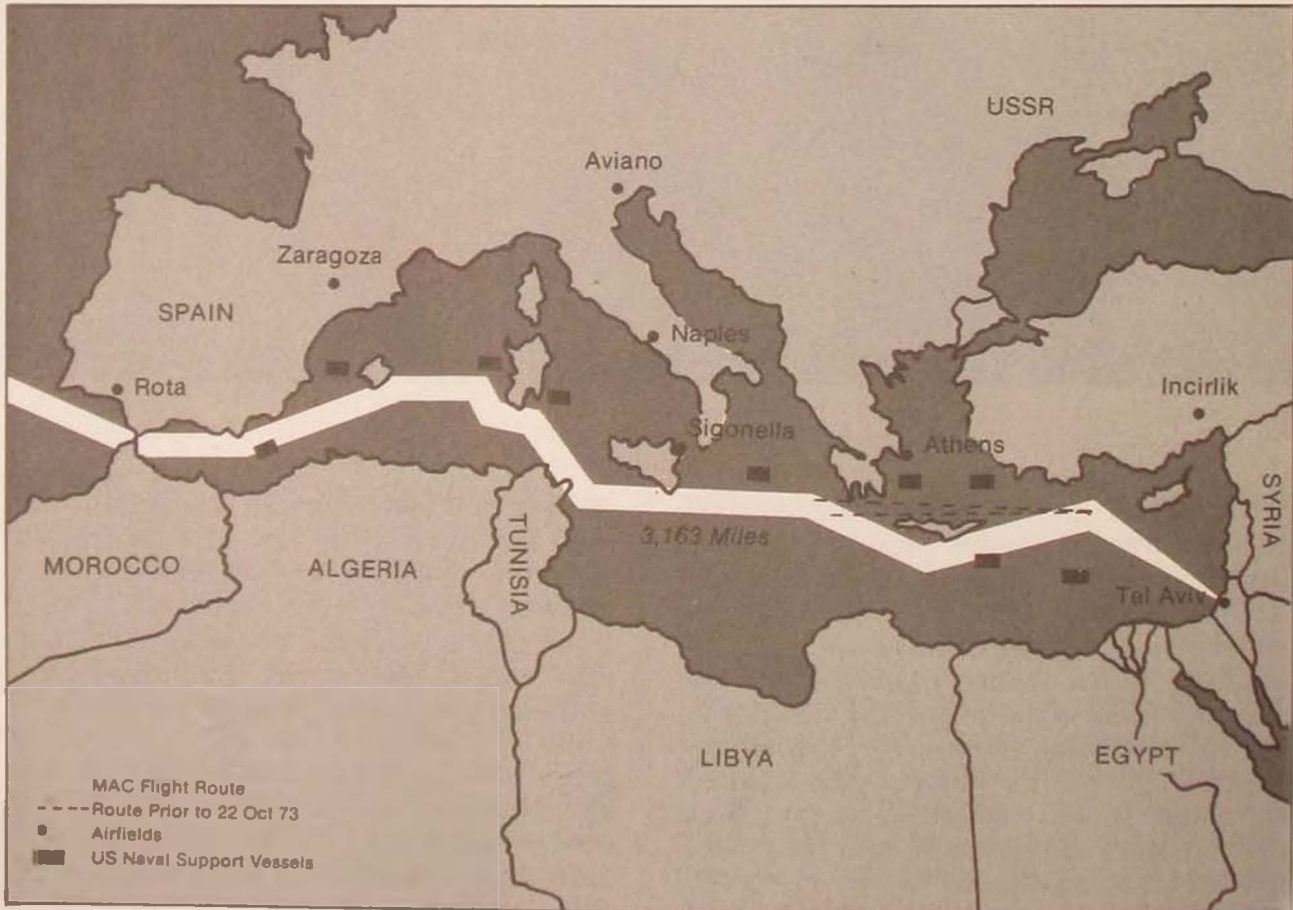
quickly as it had hoped. In dealing directly with the Israelis, the United States stipulated that it would provide military assistance only under certain conditions.¹⁰ First, Israel was not to have provoked the Arabs into starting the conflict. In a related requirement, the United States wanted assurance that Israel had not ordered a preemptive military strike against the Arabs, thereby initiating hostilities. Two events emphasize US intransigence on this issue: on the morning of 6 October, the US ambassador to Israel cautioned Prime Min-

ister Golda Meir against a preemptive attack, stating that the United States could not resupply Israel under that circumstance; at the same time, Secretary of State Kissinger warned Israel's foreign minister not to initiate the fighting if Israel desired US support. Actually, Mrs Meir had already ruled out a first strike even though military intelligence indicated that an Arab attack was imminent. Yet another criterion for aid was that it would be offered only for self-defense. It is possible the United States established this condition so that the Soviets would perceive US military aid to Israel only as a counterbalance to Soviet aid to Egypt and Syria.

The US Departments of State and Defense had similar concerns for Soviet opinion and established their own conditions for aid to Israel.¹¹ First, Secretary Kissinger did not want military aid to Israel to disrupt US relations with either the Arabs or the Soviet Union. Further, he wished to avoid damage to the ongoing negotiations over the Middle East situation or to the spirit of détente that existed with the USSR. Within the Department of Defense (DOD), Secretary of Defense James Schlesinger initially did not want MAC to deliver goods directly to Israel. Instead, he favored a covert operation in which MAC would fly supplies to the Azores for pickup by Israeli aircraft.

Because of these numerous conditions, the United States deliberated for nearly a week on whether to authorize military aid to Israel. After costly battles, particularly in the Sinai, Israel on 8 October again requested assistance from the United States.

MAC pilots were careful to stay in international airspace during the flight from Lajes to Tel Aviv. The original route north of Crete had to be changed to comply with a request from the Greek government.



This time it asked for aircraft, tank and artillery ammunition, and electronic countermeasures (ECM) equipment.¹² Despite a deteriorating battlefield situation, the United States was still reluctant to commit to a resupply, preferring to analyze the extent of Soviet efforts and determine its effect on détente. At this point, the United States gave Israel tacit approval for El Al, the Israeli airline, to begin moving supplies to Israel. Consequently, planeloads of bombs and air-to-air missiles arrived in Israel on 10 October.¹³

The Airlift Takes Shape

Gen Paul K. Carlton, MAC commander, kept a close watch on the unfolding events. During the early part of the war, MAC was



Upon arrival at Lod Airport, Tel Aviv (below), the supplies were immediately loaded aboard waiting trucks for delivery to the front (above). Critical supplies reached the northern front in about three hours.





Even such oversize items as this 175-mm cannon (above) and M-48 tanks (below) were delivered by air. C-5 aircraft airlifted almost half the total tonnage of supplies yet flew only 25 percent of the total sorties.



directed to provide a number of options for airlifting war materiel to Israel. Accordingly, MAC prepared its plans and waited for a political decision. In the following days, these plans changed repeatedly as the White House, National Security Council, and the Departments of State and Defense wrestled with the complexities of the war and its political and economic factors to determine the extent of US involvement.¹⁴

One of the options examined at various levels called for MAC to airlift cargo to the East Coast of the United States for transshipment by Israeli aircraft to the final destination. Another option was to shift the transshipment point to the Atlantic—Lajes Air Base in the Azores. Planners also considered using American commercial aircraft for the operation.¹⁵ The Israelis did, in fact, use eight of their commercial B-707 and B-747 aircraft to move 5,500 tons from the United States to Israel but abandoned this effort because their fleet could not expeditiously move the necessary quantities of cargo.¹⁶

On 12 October 1973, before a final decision was made on the method of conducting the airlift, Mrs Meir personally sent President Nixon an urgent message requesting immediate assistance. At this point Israeli supplies were running critically low, and Israel's fate was in serious doubt. That day the president ordered DOD to immediately begin an airlift to Israel with cargoes destined for offload at Lajes Air Base. The next day, however, the secretary of defense directed that the US airlift would operate all the way into Israel using MAC aircraft and that Lod International Airport near Tel Aviv would be the offload point.¹⁷

Once the method of resupply was approved, the United States funneled large quantities of equipment and materiel through an aerial pipeline that stretched across the Atlantic and through the Mediterranean. To begin the supply transfer, crews unloaded equipment and supplies at 29 locations in the United States, principally military air bases.¹⁸ Equipment and materiel were also drawn from the stock-

piles of US forces in Europe and airlifted to Israel.¹⁹

Once loaded, the transports began the approximately six-hour flight to Lajes Air Base. Lajes was the only available choice for landing and refueling because most European countries had denied overflight and landing rights to the United States, fearing that the Arabs would retaliate by withholding vital oil supplies.²⁰ Serving as a staging base for the entire operation, Lajes handled

Many of the airlifted supplies, such as these ECM pods for Israeli F-4s, helped turn the tide in the conflict. The United States learned a number of lessons, both in preparedness and airlift requirements, from Operation Nickel Grass.

30 to 40 flights per day during the airlift.²¹ Base crews handled little cargo and were more involved in maintaining the aircraft and keeping the airlift moving. The C-5s and C-141s did not unload cargo here unless they could not continue due to mechanical problems. Rather, maintenance personnel refueled the aircraft, and fresh crews boarded the C-141s. Before leaving the United States, the C-5s were augmented with extra crewmembers who often remained with their aircraft to Lod and back to the United States, sometimes flying more than 28 hours without relief.²² At the peak of the airlift, 1,300 additional personnel crowded Lajes. They were billeted in World War II barracks, psychiatric wards, show-



ers, and even aboard the aircraft. At one point, someone recommended that SAC tanker crews supporting operations and transiting Lajes bring their own sleeping provisions.²³

Once the transports departed Lajes for Israel, they flew to a point over the Strait of Gibraltar, then east over the Mediterranean to the vicinity of Crete, then southeast to Tel Aviv. On 22 October 1973 MAC changed the route to fly south of Crete, to comply with a request from the Greek government. MAC exercised extraordinary care to comply with flight restrictions; even flights originating in West Germany were routed to Lajes, then through the Mediterranean to Israel. Aircraft were also careful to avoid overflying Arab territory or entering airspace controlled by Arab countries.²⁴

Once in the Mediterranean, the US Navy's Sixth Fleet helped arrange codes, safe-passage procedures, and diversion plans in case of hostile interceptions. In fact, the Navy tracked the airlift aircraft from Gibraltar throughout the length of the Mediterranean. A ship was stationed every 300 miles and an aircraft carrier about every 600 miles to provide support, if necessary.²⁵ As incoming aircraft approached to within 150 miles of the Israeli coast, Israeli Air Force (IAF) Mirages and F-4s escorted them the remainder of the way. Most of the transports landed at Lod Airport in Tel Aviv, while some flew to an airfield at El Arish in the Sinai. Overall, the flight time from Lajes to Israel was approximately seven hours.²⁶

We had no support facilities at Lod Airport, and only a small number of US support personnel were present in Israel to assist with the airlift. To coordinate a minimum maintenance capability for the transports once they landed, the US Air Force established an airlift control element (ALCE) at Lod, while El Al maintenance crews performed routine servicing for the aircraft. To unload the planes, the Israeli Defense Forces employed a mixture of reserve personnel and civilian teenagers enlisted as laborers from the surrounding area. Israeli teams of five to 10 men emptied the

airplanes either by hand or with materials handling equipment (MHE) flown in on early chinks.* Interestingly, the first C-5 to arrive at Lod on 14 October had its 113,000 pounds of cargo unloaded by hand (in three and one-half hours) because the C-5 with the first MHE had aborted at Lajes.²⁷ In addition, the IDF was responsible for loading the supplies and ammunition on waiting trucks and overseeing their distribution either directly to the combat units or to the IDF's main depots, depending on the type of materiel. Sources report that crews averaged 30 minutes to unload the aircraft and that IDF trucks left Lod Airport approximately 90 minutes after the aircraft landed, reaching their farthest destination about two hours later. Thus, the minimum total time from arrival of the supplies at Lod to their delivery was around 3.5 hours.²⁸

Conditions at Lod were more difficult than at Lajes, not because of overcrowding, but due to a lack of US personnel. Col Donald R. Strobaugh, commander of the MAC ALCE throughout the operation, had only 12 cargo handlers and 20 communications workers when the airlift began. The number of ALCE personnel at Lod never exceeded 55 during the 32 days of the airlift. Colonel Strobaugh described working conditions at Lod in an article in the McGuire AFB, New Jersey, newspaper *Airtides*: "Our men did a fantastic job. They worked 12 hours a day—84 hours a week. Some worked more than that. If they started working on a plane at the end of their shift, they stayed on past the time they should have to finish the aircraft."²⁹

The Israelis eagerly displayed their appreciation for the hard work of the ALCE and the aircrews that made the trip from the United States:

El Al Airlines did a great job taking care of the American aircrews at Lod. Tables with catered meals were set up in a special lounge for crew

*Chinks refers to the early troop carrier practice of chalking corresponding numbers on complete, individual aircraft loads and on the intended aircraft. The term has entered general use as a means of identifying loads or missions.

members. . . . El Al's chief stewardess went around Tel Aviv asking merchants for gift donations saying they were making it possible for their businesses to continue.³⁰

Colonel Strobaugh also received 75 to 100 letters each day from Israeli schoolchildren. One typical letter read, "Thanks for helping us in our war. When you have a war, we will help you."³¹

Measuring Airlift's Performance

The airlift to Israel lasted 32 days. Though not as large as the Berlin airlift, which carried more than 2 million tons of supplies to that city, the US airlift of 22,305 tons to Israel was impressive, nevertheless. The C-141s flew 421 missions to Israel, delivering 11,632 tons of equipment and supplies, while the C-5s flew 145 missions and delivered 10,673 tons of cargo. Some 48 percent of the total tonnage was moved on Galaxy flights, yet they flew only 25 percent of the missions.³² The Soviet airlift to Arab allies pales in comparison:

Best estimates of the Soviet effort were that their 935 missions, over a distance of 1,700 miles, moved in about 15,000 tons during a 40-day period. In short, MAC airlifted one-fourth more cargo with a little more than one-half the missions over a route that was three times greater.³³

Overall, it appears that the American airlift had both substantive and psychological effects. The Israelis, who had begun to worry about how many shells they had left, were able to resume an extremely high rate of fire with the delivery of plentiful stocks of 105-, 155-, and 175-millimeter ammunition. With the influx of many of the consumables of war to replenish depleted stockpiles, they also were emboldened to throw all available reserves into the battle and succeeded in breaking through the Egyptian lines to the west side of the Suez Canal, threatening the bridgehead established by the Egyptians on the east side, and encircling the Egyptian Third Army.³⁴ Psy-

chologically, the Egyptians were shaken by this reversal of their military successes.

Another example of the impact of the airlift on the war was the effectiveness of the TOW and Maverick missiles. According to the Defense Intelligence Agency, these weapons were responsible for the majority of Israeli tank kills (Arab losses were estimated at 1,900 tanks during the war). Since the TOW and Maverick were not present in the Israeli inventory in any significant numbers before the war began, it is apparent that the missiles delivered by airlift made the difference.³⁵

Most accounts measure the airlift's performance in terms of tonnage moved, but it is more important to note what items were moved and their actual impact on the war. For example, only 39 percent of the Nickel Grass materiel was delivered before the cease-fire agreement on 22 October.³⁶ Further, the C-5 was able to demonstrate its capability to transport outsized cargo—items too large for other transport aircraft.³⁷

The movement of outsized cargo had different effects on the Israeli war effort but generally complemented the continual resupply of combat consumables. During the entire airlift, the C-5s delivered 29 battle tanks to Israel.³⁸ Only four of those tanks along with 10 other pieces of outsized equipment arrived before the cease-fire on 22 October.³⁹ The other 25 tanks were delivered after the fighting had stopped. Although 432 Israeli tanks were lost between 6 and 8 October during the armor battles of the Sinai, the Israelis did not overlook the psychological value of the airlifted tanks.⁴⁰ The General Accounting Office (GAO) report on the airlift assessed the impact of the outsized cargo accordingly:

The aerial delivery of combat tanks and other outsize cargo by C-5s was an impressive use of airlift capability and it is impossible to assess the psychological impact of demonstrating this capability. In our opinion, the relatively small quantities of outsize equipment delivered in this manner had no effect on the war's outcome.⁴¹

Facts and figures aside, American airlift "reversed the imbalance of military power created by the vast shipments of Russian war material to the Arab nations and led to a cease-fire which in turn brought about a return to the status quo. In short, the airlift made possible the achievement of a national objective—peace in the Middle East."⁴²

Nickel Grass and Its Mark on US Airlift Capability

The Military Airlift Command received near-unanimous high marks for its performance under demanding conditions, but the operation was not entirely free of problems. Fortunately, MAC resolved these difficulties before they jeopardized the operation. Still, there were lessons to be learned. After the cease-fire, MAC officials examined these areas and gained insights that would benefit future airlift capability. Three areas requiring improvement were particularly prominent: (1) air refueling (AR), (2) command and control, and (3) management of airlift resources.

Need for Air Refueling

Although the C-5 could have carried a reduced load of 33 tons nonstop from the United States to Israel, the C-141 could not have flown this mission nonstop at all.⁴³ Without the C-141, it would have taken more than 670 C-5 flights to deliver the same 22,305 tons to Israel. At the directed daily aircraft flow rate of six to eight arrivals per day, the operation would have taken 100 days.⁴⁴ The C-5 has always been capable of in-flight refueling (the C-141 lacked this capability at the time of the operation); however, MAC did not use AR because of concerns about its effect on the aircraft's then questionable wing.⁴⁵ Technicians later determined that AR would have put less stress on the wing than the extra takeoffs and landings. Further, the political climate

in Europe prevented the United States from strategically positioning tankers to provide refueling for the return trip from Lod.⁴⁶

Thus, the Israeli airlift was possible only because our aircraft were able to use Lajes Air Base. Although Portugal made Lajes available for this operation (after considerable negotiation), it is uncertain whether we will always have access to this facility. Therefore, an important lesson learned from the airlift is that implementation of our policy of remote presence requires an effective in-flight refueling capability. MAC and the Air Force have recently made great strides in this area. In fact, the current refueling capability of the C-141 and C-5, the procurement of the KC-10, and the commitment to training in air refueling all have their genesis in Nickel Grass.

Need for Improved Command and Control

General Carlton described the problems of command and control during Nickel Grass in a 1984 interview:

The concept of operating within an established command and control structure was violated—the Air Force didn't set up a command post to handle our activity; yet, we were working for the Air Force. We found ourselves taking instruction primarily from JCS/J-4, Logistics. Command and control, or rather a lack of it, caused indecision.⁴⁷

General Carlton went on to explain that, despite operating in European Command's (EUCOM's) theater of operations, the command "wasn't even in the equation for this operation."⁴⁸ Instead of tying into EUCOM's command and control system, MAC aircraft transiting the Mediterranean worked indirectly with the Navy's Sixth Fleet through the Joint Chiefs of Staff (JCS), as mentioned previously.

The GAO report on Nickel Grass further identified specific shortcomings in command and control procedures: (1) insufficient numbers of experienced people to manage emergency airlift operations, (2) inadequate communications facilities, (3) in-

accurate and delayed reports to higher levels, (4) deficient dissemination of critical weather data, and (5) the lack of reliable, high-quality voice, air-to-ground, and secure communications.⁴⁹ After the operation, each item was redressed through modernization of equipment or additional training and manpower.

Need for Improved Management of Airlift Resources

The GAO report also made the point that "to manage an airlift efficiently, MAC should control the flow of aircraft."⁵⁰ That is, MAC should specify the types of cargo and number of passengers to be moved and the time frames for movements. Then MAC should determine the type of aircraft, airlift flow, and methods of delivery best suited to meet the requirements. During the Israeli airlift, quite the opposite was true. DOD directed MAC's operations and frequently changed the aircraft flow rate. To comply with the variable flow rate, MAC had to position extra aircraft and crews at Lajes and use them as directed. This procedure proved to be counterproductive to efficient management of aircraft, crews, and facilities. According to DOD, the secretary of defense controlled the airlift because political considerations were more important than efficient airlift management. However, DOD did agree that, to achieve economic use of aircraft, MAC should have a say in determining total airlift needs.⁵¹

Furthermore, MAC initially did not have access to the C-130 fleet to move small but critical loads to certain locations because these aircraft were either theater assets under the control of theater commanders in chief (CINCs) or CONUS-based assets under Tactical Air Command. Because of this situation, it wasn't until 15 October that 12

C-130s per day were dedicated to MAC for use, even though initial planning for Nickel Grass began on 6 October.⁵² As it turned out, these instances of doubtful airlift management were powerful arguments for airlift consolidation—which took place on 1 December 1974—and for designating MAC as a specified command on 1 February 1977.

Final Assessment

Along with the Berlin airlift of 1948 and 1949 and numerous other military and humanitarian emergencies, Nickel Grass takes its rightful place in proving that airlift is a key factor in America's military and diplomatic activities around the globe. MAC dramatically demonstrated its ability to organize quickly and transport vast amounts of cargo over global distances to support our government's policies. Furthermore, the fact that our effort exceeded the Soviets' did not go unnoticed in capitals throughout the world. Nickel Grass convinced many people that airlift is a vital component of our national strategy of deterrence: "The demonstration of capability and determination doubtless will not be lost on friend or foe and should prove of great value in underscoring the deterrence that is the cornerstone of American strategy."⁵³ Perhaps the most meaningful assessment of our role came from Israeli Prime Minister Golda Meir. During a private meeting in Washington with American Jewish leaders three weeks after the cease-fire, she emotionally commented that "for generations to come, all will be told of the miracle of the immense planes from the United States bringing in the materiel that meant life to our people."⁵⁴ □

Notes

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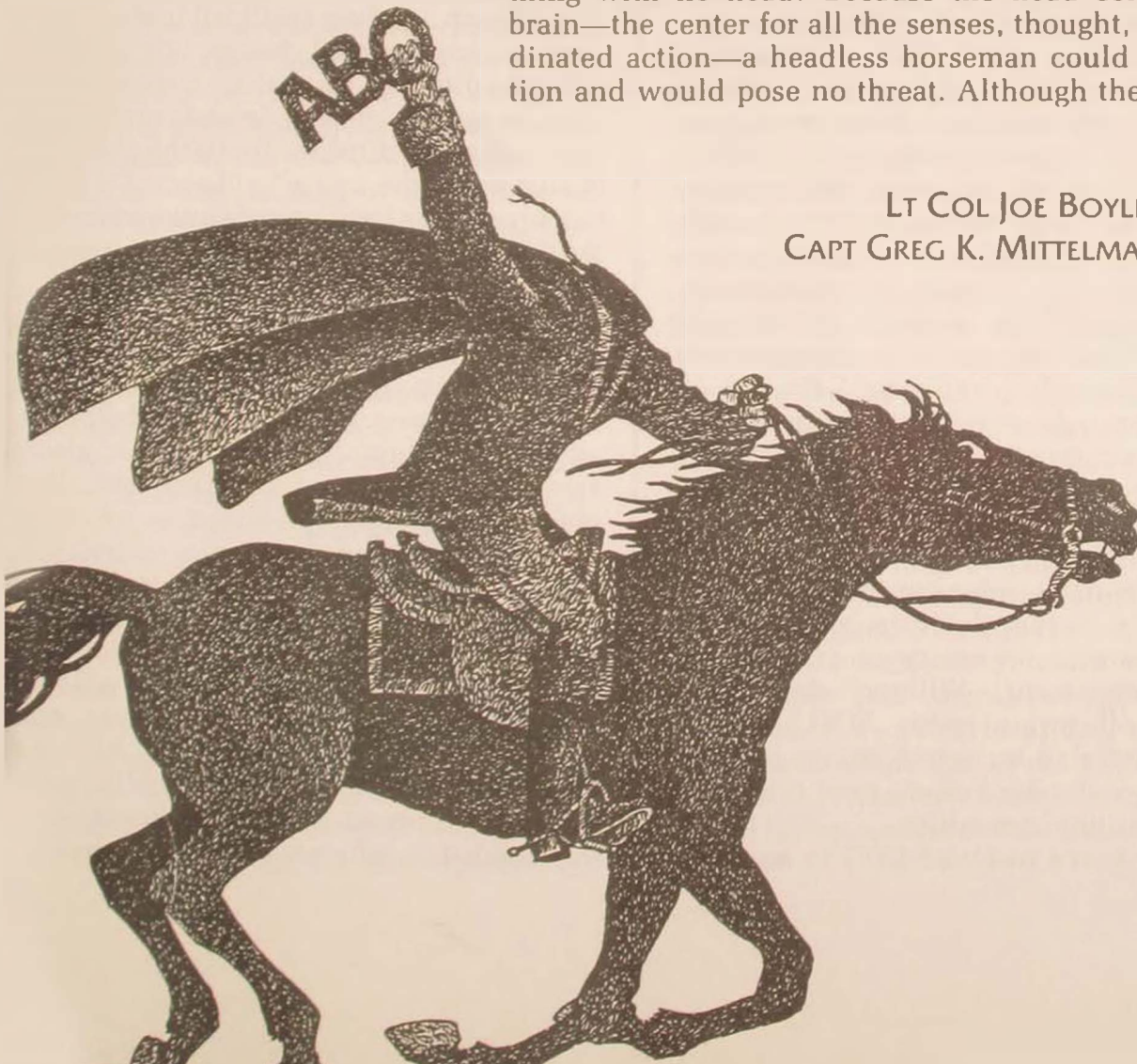
Paradox of the Headless Horseman

On mounting a rising ground, which brought the figure of his fellow traveler in relief against the sky, gigantic in height, and muffled in a cloak, Ichabod was horror-struck, on perceiving that (the rider) was headless!—but his horror was still more increased, on observing that the head, which should have rested on (the rider's) shoulders, was carried before him on the pommel of the saddle.

—Washington Irving, "The Legend of Sleepy Hollow"

AS children, we were terrified by the specter of Irving's mighty horseman riding through the night without a head. But years of experience have diminished our fear, and the former nightmare has been reduced to a quaint fairy tale. Perhaps one of the reasons we no longer dread the haunts of Sleepy Hollow is that the very idea of a headless horseman is a paradox—why should we fear anything with no head? Because the head contains the brain—the center for all the senses, thought, and coordinated action—a headless horseman could not function and would pose no threat. Although the headless

LT COL JOE BOYLES, USAF
CAPT GREG K. MITTELMAN, USAF



horseman may have existed only in the mind of nineteenth-century author Washington Irving, countless examples today suggest that the paradox he represented still persists. Specifically, it exists in organizations that either have no mission or lack the leadership necessary to accomplish the mission.

Nowhere is the paradox more prominent than in air base operability (ABO), the newest in-vogue phrase to describe the ability of the US Air Force to defend and regenerate its air bases following attack. The Air Force has long possessed the fundamental capabilities of ABO—explosive ordnance disposal, damage response, disaster preparedness, fire fighting, and runway repair—but has failed to join these parts into a whole.¹ Consequently, our training has been fragmented, acquisition of new equipment inadequate, and development of doctrine incomplete. The net result is a questionable ABO capability.

An example of a modern headless horseman is the Air Force explosive ordnance disposal (EOD) career field. Previously, EOD accepted only officers and enlisted specialists experienced in other munitions career fields. Because storing and loading munitions is an adjunct to aircraft maintenance, EOD units—although they lacked any maintenance function—were organizationally tied to the deputy commander for maintenance (DCM). Since the DCM's primary mission was sortie production—to which EOD rarely contributed—the fate of EOD officers took one of two roads: benign neglect and career oblivion or conversion to a sortie-producing specialty. EOD leadership was left in the capable hands of senior noncommissioned officers, adept at executing an operations order but ill equipped to develop the vision, doctrine, and bureaucratic apparatus necessary to carve out a mission statement. Without dedicated, long-term officer leadership, EOD has been left to wander an uncertain course despite being one of the Air Force's most critically needed wartime specialties.

The Air Force resigned EOD to an even

lesser backseat role when the Navy assumed joint Department of Defense (DOD) responsibilities for technical training and equipment development. Many of the responsibilities expected from an officer corps were swept away in the interests of efficiency and economy. In essence, the Air Force has received from EOD what it paid for: since little has been invested, not much has been gained. Interestingly, the life preserver for EOD's mission—as well as for several other poorly organized yet vital career fields—is firmly attached to air base operability.

The ability of an air base to survive an enemy attack and quickly reconstruct minimum essential operating areas so it can resume offensive air operations has long been a concern to people who think seriously about war. Because the problem is difficult to solve, our solution was to have faith in the joint air defense network and assume that forward air bases were invulnerable.² In the 1980s we no longer suffer from that illusion; our bases will fall under attack from enemy special forces, quick-strike ground units, and tactical air forces. Therefore, we must prepare to defend, survive, repair, and reconstitute to fulfill the objective of sustaining the war effort beyond the initial surge.³ Air base operability encompasses the emerging mission area of sustaining air operations before and after attack.

It isn't surprising that ABO has been long ignored—the Air Force has a history of emphasizing its glamorous, state-of-the-art weapon systems. New strategic bombers, advanced tactical fighters, strategic airlift vehicles, and tactical missiles—so-called sexy weapon systems—attract much more support and attention than a technically unsophisticated, armored bulldozer needed to remove unexploded ordnance from runways. Yet all of these advanced strategic and tactical systems will be wasted unless we also organize, train, and equip for ABO.⁴ Make no mistake, ABO is a fundamental warfighting capability because it will permit aerospace forces to sustain combat operations. As Under Secretary

of the Air Force Tidal McCoy puts it, ABO is Task One in the ability to project an air "force." ABO is the fundamental base of the air operations pyramid that allows Task Two (aircraft) and Task Three (munitions) to sustain combat.⁵

Just as EOD needs help, so does ABO. A strong advocate and mission statement are the ingredients to ensure that ABO will survive the tough budget battles that lie ahead. It is amazing that ABO still exists without the bureaucratic constituency so necessary to survive in times of fiscal restraint and limited resources. ABO survives because of the crying need recognized at base level in our overseas commands. This grass-roots approach to building an organization is an unusual, rather inefficient way of carving out a mission element. The usual approach is to begin with a statement of need followed by bureaucratic, top-down management of the supporting programs. But this procedure has not been observed with ABO, where the mission has slowly and sporadically evolved without significant centralized or coordinated guidance.⁶

The basic responsibility of any service is to organize, train, and equip combat forces. A deficiency in the first requirement—organization—has resulted in our failure to support the ABO mission. The Air Base Operability Division is under the Deputy Chief of Staff for Plans and Operations. This association is probably a mistake from the standpoint of establishing and maintaining a strong power base. Ultimately, ABO is a logistics, engineering, and services responsibility—clearly the charter of the Deputy Chief of Staff for Logistics and Engineering. Selecting an appropriate bureaucratic power base is vital to any emerging mission element in order to help enhance and develop capability. The importance of a strong advocate cannot be overstated, particularly in times of shrinking budgets.⁷

Even if there is a central office for ABO in the Pentagon, the bureaucratic foundation breaks down at the next lower level, where the major commands disagree on organization and support for air base operability.

Some commands place responsibility for ABO in the staff of the deputy for operations while others task the logistics deputy or civil engineering. Still other commands, notably some in the CONUS, have not fully lent their support to ABO and, as a result, have fragmented the effort needed to get the concept completely off the ground. Thus ABO, recognized as an urgent need by many people, faces an uncertain future without the cohesive bureaucratic line and staff development necessary to wage the fiscal and doctrinal battles now under way.

Similarly, the ABO concept sorely lacks internal leadership. Unfortunately, there is no easy solution to this dilemma. It takes time and patience to develop leaders who are thoroughly indoctrinated, practiced, and schooled in their career specialties and the profession of arms. The core of future ABO leadership will come from the career fields of EOD, disaster preparedness, security police, and civil engineering. Two of these fields, EOD and disaster preparedness, have not fared well in the officer corps because they were either organizationally misplaced or considered to have no consistent peacetime or wartime role. These attitudes must change. Once again, we get what we pay for. Until the corporate Air Force structure recognizes the legitimacy of ABO, acknowledges its warfighting aspect, and centralizes management, the concept will flounder. On the other hand, recognition of ABO together with support from a strong advocate would create a legitimate career path of line, staff, and command functions with commensurate academic and professional schooling. The Air Force could cultivate its ABO leadership from second lieutenants and junior NCOs and use cross trainees from other combat-support career fields as a stopgap during the interim. Ideally, cross utilization between ABO and other traditional combat-support career fields, such as personnel and services, could serve to strengthen each area and introduce the warrior concept to a broader base of future leaders in the officer and NCO ranks.

The staffs at Headquarters US Air Force and the major commands provide the framework for ABO, but implementation of combat capability is the responsibility of the air base. Air base operability is a combat-support function and rightly belongs to the base commander. Below this level, the water is muddied across organizational lines. Properly organized, ABO can justify a squadron structure composed of EOD, disaster preparedness, fire fighters, power production, and airfield management. This structure would require breaking into mission territory reserved for civil engineering, but the advantage of joining the elements of ABO is worth the pain of reorganization. ABO is inextricably linked to civil engineering; once this relationship is understood and acknowledged, redefining mission lines is not inconceivable.

Civil engineering has been at the vanguard in transforming Air Force peacetime attitudes to a wartime perspective.⁸ Historically, Air Force thinking has limited the warrior's mantle to aircrews and security police units charged with base defense. The vast majority of Air Force personnel have been characterized as direct or indirect combat-support technicians: people in maintenance, transportation, services, munitions, supply, to name a few. Many individuals still view the rear echelon base as an invulnerable garrison. This perspective has allowed most Air Force specialties to comfortably slip into the role of technician or resource manager, an approach that appears to work during times of peace but is ineffective during war.⁹ On the other hand, the civil engineering corps—mindful of the lessons from Navy Seabees and Army combat engineers—embarked on a warfighting course with the formation of Red Horse and Prime Beef units in the 1960s.¹⁰ These organizations are good examples of the warrior spirit for future ABO operations and squadrons to emulate.

However, an effective ABO structure at base level goes far beyond those units tasked specifically for full-time operability. Many secondary skills and considerable

augmentation will be required to flesh out a wing capable of sustaining a base under attack. The recent experiences of naval units in combat in the Falkland Islands and Persian Gulf should serve as a useful reminder that just as warships are vulnerable so are air bases. Navy crewmen—with secondary skills in fire fighting, damage control, and unexploded ordnance handling—have saved more than one vessel. Air Force personnel can and should be organized to respond to base defense in the same manner, adding the skills of defensive infantry tactics and buddy-care first aid to the ABO repertoire.¹¹ Furthermore, passive defense measures including camouflage and concealment techniques developed in ABO circles need to be taught and practiced by augees to help protect their respective work areas. ABO is much larger than a small division of specialists responsible for selecting a minimum operating strip and repairing adjacent facilities. It is a warrior spirit that needs to permeate the entire air base population and supporting organizations.

Just as ABO requires central leadership and broad-base acceptance, so does it need a center where personnel can practice integrated tactics, test units operationally, test new equipment, and refine the doctrine that field units will need to employ. If the Air Force Engineering and Services Center (AFESC) is the proper organizational home for ABO, then it should be formally designated as such and supported with additional monies and expertise that show commitment and resolve. But the concept needs to expand beyond base recovery after attack (BRAAT), now practiced on field no. 4 at Eglin AFB. The ABO center should also include the means to defeat or deceive attackers and protect command, control, communications, and intelligence (C³I) systems to coordinate all the elements that comprise ABO.¹² It is time to realize that initial training in disaster preparedness, explosive ordnance disposal, runway repair, and security gives technicians and officers only the basic tools to protect and defend the air base.

ABO, on the other hand, integrates specialties into a coordinated unit mission to support the air base during wartime conditions.

The immediate threat to ABO is that it may fall victim to the budget ax before being given an opportunity to flourish and contribute to combat capability. Even though ABO equipment is far less expensive than our newest weapon systems, the danger of neglect is ever present. It is important to remind programmers that the most capable aircraft or tactical missile is useless if locked in a Tab-Vee shelter at an air base, frozen after attack to the point of immobility. Ultimately, the air base is the foundation of our logistics system. We would do well to heed the reminder of popular novelist Tom Clancy's antihero in *Red Storm Rising*: "The tactics . . . no, amateurs discuss tactics, Alekseyev thought wryly. Professional soldiers study logistics."¹³

Another danger lies in the mental trap of viewing a new capability only from the vantage point of what it is designed to accomplish. The value of ABO lies not so much in what it will allow the Air Force to accomplish but what it will prevent the enemy from accomplishing—namely, shutting down operations after the first attack. In fact, ABO is not a new capability—just a

plan of action to correct the persistent, though erroneous, assumption that our bases are invulnerable.

To summarize, ABO faces many challenges. Among these are competition with glamorous new weapons in lean budget years, acquiring strong advocacy from the Air Staff, obtaining common agreement on organization among the major commands, establishing a coordinated ABO career path to develop officer and NCO leadership, embodying the warrior spirit in career fields that have emphasized peacetime management in lieu of wartime leadership, and creating a center of excellence to coordinate integrated training, doctrine development, and equipment acquisition. We do not help matters by failing to address these tough issues. It is not enough to leave the challenges of ABO in the hands of overseas base-level commanders; each obstacle must be addressed by corporate Air Force leadership bent on strengthening the logistics base to permit projection of air power. Like EOD, ABO requires central focus to fully develop its leadership in order to sustain combat operations. It is time to lift the head from the saddle and place it on the shoulders of the horseman. ABO deserves no less than strong leadership, central focus, and unwavering support. □

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A Rare Feeling of Satisfaction

MAJ MICHAEL A. KIRTLAND, USAF

AS the ground launched cruise missile (GLCM) and Pershing II troops return to the United States from Europe, it seems appropriate to reflect on the meaning of the Intermediate-range Nuclear Forces (INF) Treaty. Many people have already speculated on whether the treaty is a "good deal" or a "bad deal" and whether we are more or less safe from Warsaw Pact threats. To understand the situation, we must consider why the missiles were deployed in the first place.

NATO decided to deploy the missile systems to counter Soviet deployment of the SS-20 mobile missile. NATO made it clear at that time that if the Soviets did not deploy their missiles, new NATO systems would not be deployed. The Soviets attempted to call our bluff by denying any such mutual restraint. They felt they could ensure sufficient political unrest within the NATO alliance and could convince antinuclear activists in Western Europe that NATO would be unable to deploy its systems. In so doing, the Soviets saw an opportunity to weaken or perhaps even split apart the Western alliance. In simple terms, they expected NATO resolve to crumble under Soviet saber rattling.

Instead of crumbling, NATO stood firm, and its members worked together as they have for the last 40 years. The deployment of NATO missiles was well on its way to completion when the Soviets agreed to the

INF Treaty. In the aftermath of that agreement, many people argued that removal of these systems that had helped bolster Western security would leave Europe vulnerable to Soviet aggression and perhaps damage the NATO alliance. They seem to have forgotten the original purpose of the deployment: to convince the Soviets to remove their SS-20s—the missiles that we felt tipped the balance too far against NATO. For the first time, we achieved worldwide disposal of an entire class of nuclear weapons. NATO had seen a threat, countered the threat, and created the conditions that allowed the INF Treaty to remove the threat.

In the world of nuclear deterrence it is often difficult to tell just what impact a country's actions have on any given situation. In the case of the INF Treaty, however, we have rare, tangible evidence of the success of our time on alert in Europe: the SS-20s are being removed and destroyed. We should remember that it is the job of deterrent forces to keep the peace. The GLCM and Pershing II forces have contributed to keeping that peace and to making the world a little bit safer.

Other forces will remain to keep the deterrent alive. But as the INF troops go to other tasks, it is important to remember that they are leaving, not because they have reached their rotation date, but because they have accomplished their mission. They can come home with a rare feeling of satisfaction. □



Winter 1988

IRA C. EAKER AWARD WINNERS



Col K. A. Myers, USAF

Lt Col J. G. Tockston, USAF

for their article
"Real Tenets of Military Space Doctrine"

Congratulations to Col Kenneth A. Myers and Lt Col John G. Tockston on their selection as the Ira C. Eaker Award winners for the best eligible article from the Winter 1988 Issue of the *Airpower Journal*. Lt Col Tockston receives a \$500 cash award for his contribution to the Air Force's professional dialogue. The award honors Gen Ira C. Eaker and is made possible through the support of the Arthur G. B. Metcalf Foundation of Winchester, Massachusetts.

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Weaseling in the BUFF

COL A. LEE HARRELL, USAF*

The radar-guided threat to our aircraft continues to grow at an increasing rate. Unfortunately, the electronic warfare threat is not limited to central Europe but can be found in all theaters . . .

THE threat of radar-guided weapons to our aircraft continues to grow at an increasing rate. The worst case is the Soviet integrated air defense system (IADS), consisting of over 7,000 early warning radars, 13,000 surface-to-air missile (SAM) launchers, and 12,000 air-defense guns.¹ Unfortunately, the threat of electronic warfare is not limited to central Europe but can be found in all theaters. Our current airborne capability to combat this threat is technically quite good but also very limited in range and numbers. The good news is that reasonably inexpensive solutions exist. I propose that we employ conventionally tasked B-52s, assisted in the highest threat areas by the Army's multiple launch rocket system (MLRS), to augment our current defense suppression assets.

¹I gratefully acknowledge the assistance of Maj Gary C. Morgan, USAF, in the preparation of this article. Major Morgan, formerly of the 52d Tactical Fighter Wing at Spangdahlem AB, West Germany, is currently with the Tactical Air Warfare Center at Eglin AFB, Florida.

In Europe, our electronic combat capability consists of one wing of F-4G/F-16C Wild Weasels, one squadron of EF-111 Ravens, and a squadron of EC-130H Compass Call aircraft. These assets could be augmented by a like number of TAC aircraft, assuming there is no other contingency requiring TAC's support. The in-place force in Europe provides defense suppression for a very limited number of locations along the forward edge of the battle area (FEBA), where our attack aircraft could operate or penetrate. Due to the Weasels' limited range, there is no in-place capability in NATO's Allied Forces, Northern Europe (AF-NORTH) and Allied Forces, Southern Europe (AFSOUTH) without use of scarce air refueling assets or resource-intensive forward basing. Although the EF-111 and EC-130H have greater range than the Weasels, the synergistic effect of the EF-111's jamming of the IADS radar, Compass Call's jamming of command, control, and communications (C³), and the Weasel's lethal antiradiation missiles (ARMs), makes joint employment of all three assets the most ef-

fective combat option even though it limits the package to the Weasel's area of coverage. However, using our conventionally tasked B-52s armed with the AGM-136 Tacit Rainbow antiradiation drone would increase both our range and coverage.

The B-52 has virtually unlimited range and is capable of carrying 30 Tacit Rainbow drones, giving it the firepower of over a dozen Weasels (each Weasel nominally carries two ARMs).² In addition, the B-52 has an electronic countermeasures (ECM) capability that conceptually approximates the combined capabilities of the Compass Call (EC-130H) and EF-111 aircraft (i.e., the ability to jam the same bandwidths). Assuming

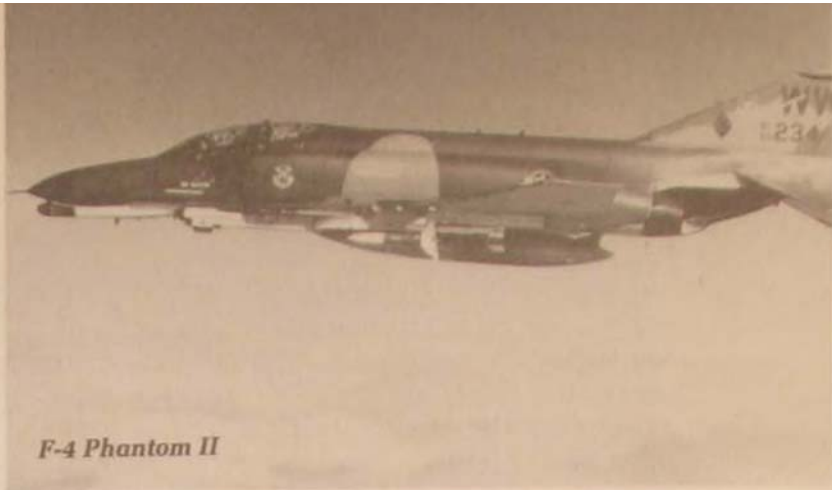
Clockwise from below are the EF-111A, EC-130H, F-4G and F-16C. In Europe, these ECM combat aircraft can work together to form a very effective electronic shield and strike capability, but they are limited in range and numbers. An EB-52 would have the combined capability of these tactical aircraft as well as longer range and the ability to employ the Tacit Rainbow antiradiation missile.



EC-130H



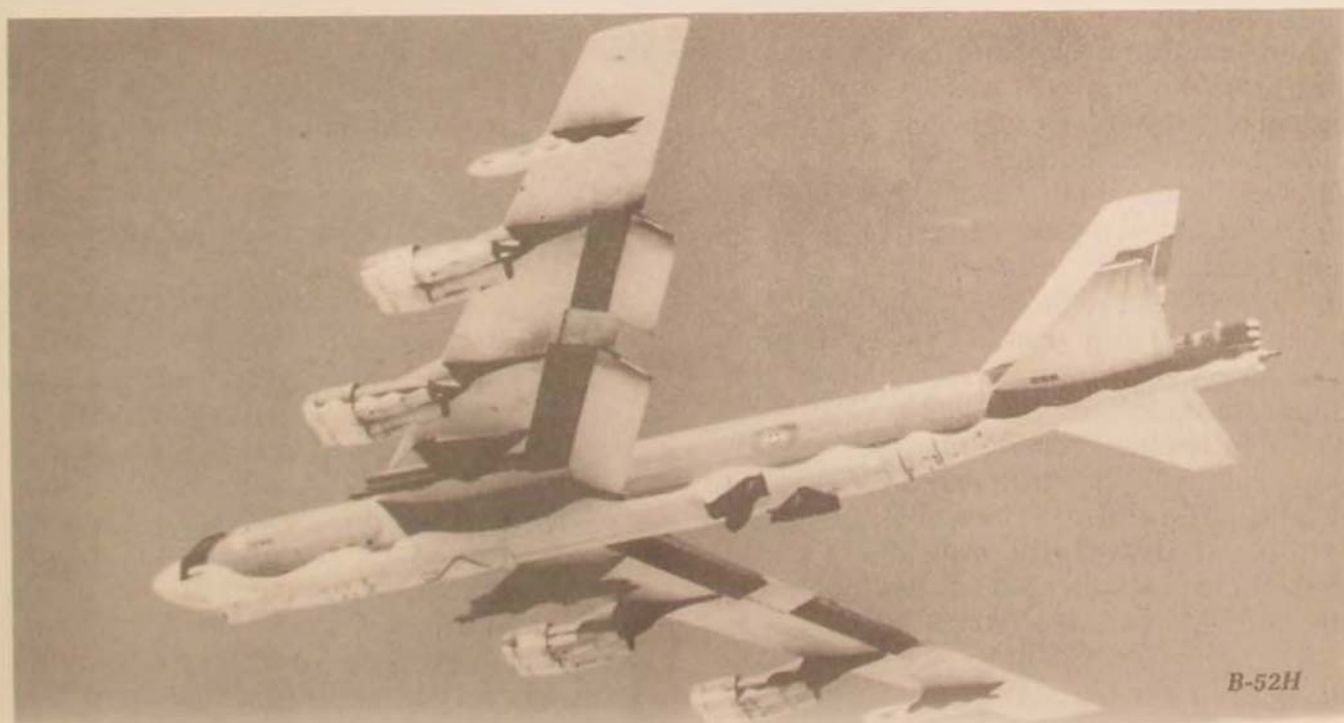
EF-111A



F-4 Phantom II



F-16C



B-52H

the Tacit Rainbow has at least the same effectiveness as the Weasel's best weapon—the AGM-88 high-speed antiradiation missile (HARM)—the potential to destroy enemy SAM radars is actually increased. Since the Tacit Rainbow was developed 10 years after the HARM, it is reasonable to assume that its capability is actually better than the HARM's.

The Tacit Rainbow also has two major advantages over the HARM: range and loiter time. *Jane's Defence Weekly* credits Tacit Rainbow with a range of "several hundred kilometers," which greatly exceeds that of the HARM.¹ More important, because it is a winged drone rather than a ballistic missile, Tacit Rainbow is able to loiter in the target area. Therefore, the enemy ground radar operator cannot defeat the antiradiation munition by shutting off the target radar since the AGM-136 will simply loiter in the target area until the threat radar is turned on. If the radar operator chooses to remain "off the air" while Tacit Rainbow is in the vicinity, the weapon will have accomplished its mission of protecting our attack aircraft. A coordinated HARM/Tacit Rainbow (and Harpoon?) attack, especially in a maritime operations role, would give an enemy radar operator cause for increased vodka consumption.

The combined capabilities of the B-52 and Tacit Rainbow provide opportunities not now available, range being the most prominent. The current defense suppression assets are able to provide coverage of NATO's Central region, but, as noted above, they cannot easily support the AFNORTH and AFSOUTH regions. The "BUFF Weasel" (EB-52?) can provide that capability with a very small number of B-52s. In addition, arming the B-52 with Tacit Rainbows would enhance its current maritime operations role in both European and maritime theaters. The ability to suppress the significant naval SAM threat would give greater freedom to US and NATO aircraft (both carrier and land-based) to attack hostile ships.

The range of the Tacit Rainbow will allow the B-52 to remain outside the scope of the

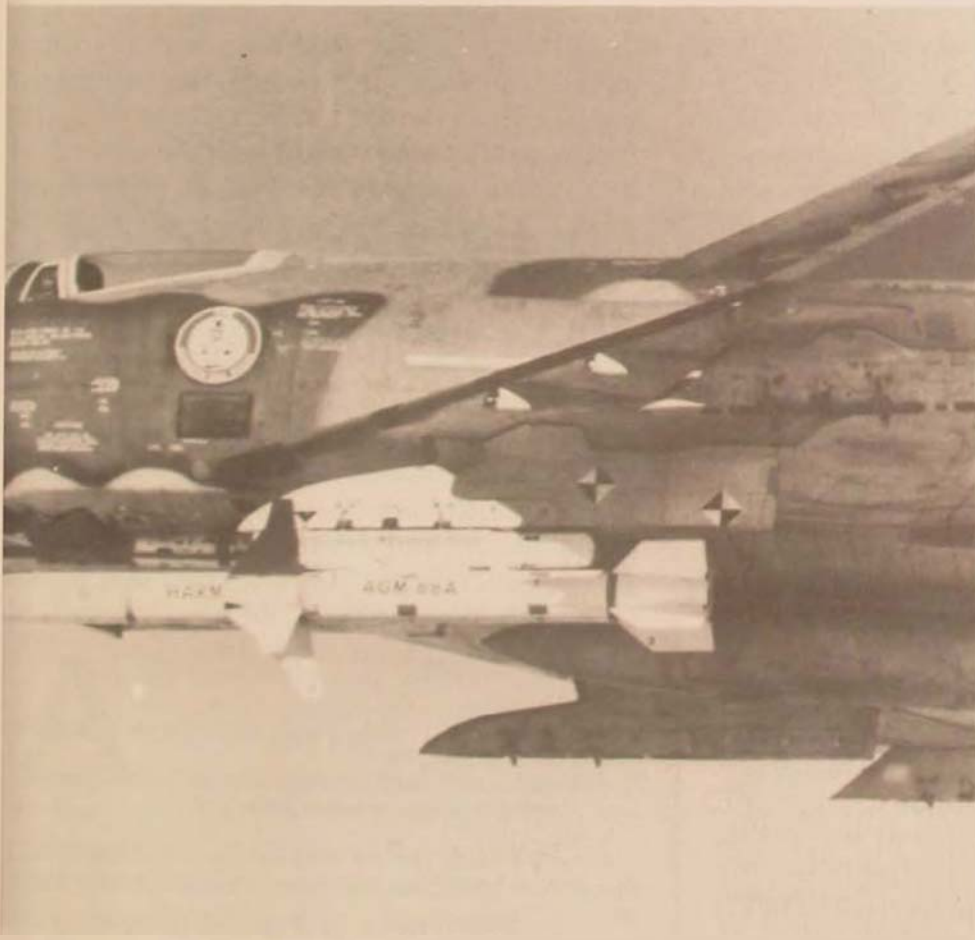
threat normally found at the FEBA (e.g., mobile SAMs, infrared (IR) SAMs, and guns) and on ships. In addition to keeping this limited resource out of harm's way, no Army corps airspace would have to be allocated to the B-52 because it could operate well back from the FEBA and above the normal ingress/egress routes. Currently, significant coordination is necessary to allow the Weasels to work near the FEBA; required fire-control measures often hamper the ground commander's ability to make good the air defender's promise that "if it flies, it dies."

Few experts doubt that we need more defense suppression assets. As a simplistic yardstick, if defense suppression can reduce the loss of NATO aircraft by only 2 percent, it will save the equivalent of a wing of fighters (72) for each week's 3,600 combat sorties. Yet, in our current budget climate, the first question asked concerns cost. In one sense, there is no additive cost in my proposal. The Air Force has already announced its desire to dedicate a portion of the B-52G force to conventional operations as the B-52H, B-1, and B-2 assume the strategic nuclear mission. My proposal simply offers a specific conventional role for the B-52Gs. Tacit Rainbow is nearing operational status and is designed for employment by the B-52. Since the B-52 is obviously a "sunk cost," the primary additional expense would come from operation and maintenance (O&M). The fact that relatively few B-52s (less than a squadron) are essentially as effective as an entire Weasel wing plus EF-111s and EC-130Hs suggests that my proposal would be both fiscally and operationally cost-effective.

Basing options also favor BUFF Weasel. The B-52's intercontinental range would allow it to operate from CONUS locations if operational constraints (short-notice contingency) or funding constraints required such basing. Since the lengthy flight time would significantly reduce the B-52's availability and responsiveness, the use of a forward operating location (FOL) to provide in-theater responsiveness is attractive. This



The AGM-136A Tacit Rainbow will be carried on board Navy A-6 aircraft. Using the EB-52 for maritime operations would provide increased ECM coverage for antiship strikes by naval aircraft.



The AGM-88A HARM missile aboard an F-4G Wild Weasel. HARM is a highly effective system that has been in the inventory for some time. Tacit Rainbow will have the advantage over HARM of being able to loiter in the target area and automatically attack any hostile radar that is turned on.

scheme would eliminate the costs associated with maintaining a permanent base overseas. The FOL would need the standard forward base support (billeting, messing, water, minimal maintenance capability, fuel, munitions storage, and operations support). However, instead of the vast quantities of munitions required for employment of the B-52 in its conventional bombing mission, the BUFF Weasel's munition storage requirement would be relatively small and should even be less than that of a fighter FOL. A special requirement of the B-52G, though, is the production and/or storage of large quantities of demineralized water needed to augment engine thrust at takeoff.

Morocco would be an appealing location for a BUFF Weasel FOL, with advantages accruing to Morocco, the United States, and NATO. Lt Col David Dean suggests that the political climate is right for such a move: "King Hassan II . . . has always been pro-Western in his political inclination and in recent years has made a strong move toward increasing his ties with the United States."⁴ Following the ouster of the 401st Tactical Fighter Wing (TFW) from Spain, Rabat offered to base the 401st in Morocco. An FOL in Morocco would help the Moroccan economy, improve US-Moroccan relations, and provide us with a geographically ideal location. B-52s launching from Morocco would not require overflight rights to reach any location in the area of responsibility (AOR) of the commander in chief, European Command (CINCEUR). By basing the B-52s outside NATO, CINCEUR could employ the B-52s throughout his AOR (including much of Africa and parts of the Middle East) without requiring NATO sanction. Should NATO become involved in a conflict, the B-52s would obviously be close enough to support all NATO commands.

If necessary, the B-52's range would also allow it to support US Central Command (USCENTCOM) operations. Since the BUFF Weasel's primary role would be to augment, rather than replace, our current electronic combat (EC) assets, its basing should be able to support the NATO flanks (AFNORTH

and AFSOUTH), the sea lines of communication (SLOCs), and the CENTCOM AOR. Andersen AFB in Guam could cover the Pacific, and Loring AFB, Maine, could support the Atlantic. These two B-52 main operating bases, combined with an FOL in Morocco, would provide reasonable coverage of the world's hot spots.

Fighter aircraft operating at the FEBA are threatened by more defenses than even BUFFs and current Weasels can suppress. However, there is a joint capability that could become operational in the near term at minimal cost, which would provide our forces with increased defense suppression at the FEBA. A simple procedural change could help reduce the threat (especially to Army helicopters) from the ZSU-23/4 and other short-range radar threats found close to the FEBA. An F-4G equipped with the ARN-101 (a precise navigation device) can locate enemy radar emitters with enough accuracy to allow the Army's MLRS to target them. The airborne F-4G need only call the coordinates (using the Army's grid system) to the MLRS targeting center. (Since the F-4 has only UHF radios, the call might have to go to the air liaison officer with the Army unit.) There would be little or no cost involved in making the simple procedural change of providing the Weasels with the location/frequency/call sign of the receiving units.

My purpose has been to propose some low-cost solutions to the very difficult problem of providing our forces with adequate defense suppression. Like many other novel ideas, their success will require nontraditional employment of air power, true joint cooperation, and willpower not to "gold-plate" procedures that are adequate to accomplish the mission. In this period of fiscal constraint, we must do no less. □

Notes

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THINKING ABOUT AIR POWER

MAJ ANDREW J. OGAN, USAF

AIR power is the military employment of aerospace resources to defend the nation and support national foreign policy. Further, it is the application of aerospace tools to achieve the objectives of the national leadership. Air power may act independently or in concert with land and sea forces.¹

The Problem

Although such statements may be accepted today, the concept is, nevertheless, unclear. Just what is air power and, more importantly, how does it fit within the parameters of modern warfare? The questions are basic, but the answers are not readily apparent. The fact is that air power has been

fragmented. We have no comprehensive doctrine that pulls together the separate entities of air power and defines the medium of aerospace. Today's US Air Force oversees only a small portion of total air power resources. The Army, Navy, and Marine Corps all maintain "air forces" that are separate and distinct from the US Air Force.

Doctrinally and operationally, each service has developed facets of air power. Like the blind men and the elephant, each service "touches" only a portion of the air power spectrum. This fragmentation of air power has historical roots. The political objective of forming a separate air service (or retaining an air arm within land or sea forces) has blurred the very lessons of history that demonstrate the potential of air power.² Out of this turf battle has come a very limited view of air power as it relates to the activities and needs of each service. Today, air power is what each service says it is—nothing less and certainly nothing more.

Missing from the current concept of air power is a structure for doctrinal development and innovation. Rivalries and artificial boundaries must be put aside in order to define and develop its capabilities. This article assumes a dispassionate view of air power and suggests a possible conceptual framework that may aid the future development of this medium of warfare. Toward that end, this discussion develops two major themes: a conceptual framework for air power and the translation of that framework into actual applications. Together, these two themes determine the employment of air power.

Characteristics of the Aerospace Medium

Any discussion of air power or the aerospace medium should begin with a definition because the medium affects the tools available and the usefulness or applicability of future technological developments.

Today, however, there exists no concise, generally accepted definition of air power. Even the mix of tools that make up air power differs from service to service and from country to country. The problem in defining this term really turns upon the best way to delineate aerospace weapon systems from land and sea systems. Only two characteristics are needed to fulfill this requirement: environment and intelligence. A description of both characteristics and the way they interact will illustrate their impact on concepts of future air power employment.

Environment

The aerospace environment is the medium in which a military mission occurs.³ An aircraft must fly through the air to put bombs on target; similarly, a satellite must use the aerospace medium to perform its missions. In this regard, an aircraft uses the medium to accomplish military objectives. This environmental characteristic admits weapon systems such as fixed-wing aircraft and helicopters while excluding such military instruments as tanks and ships.

Admittedly, the characteristic is an obvious one. Air Force documents that discuss the performance characteristics of speed and range assume that all actions take place within the aerospace environment.⁴ However, this characteristic alone is not sufficient to distinguish aerospace instruments from sea and land forces. Bullets and shells, for example, travel through the aerospace medium but are not considered unique aerospace instruments in the same sense as aircraft. Another characteristic is needed to further delineate aerospace from the other mediums.

Intelligence

Intelligence is a logical consequence of environment. Specifically, once the vehicle is in the aerospace medium, the operator has the capability to make decisions or to exercise intelligence. This characteristic is a less

obvious but essential element of air power. The intelligence can be resident within the aerospace vehicle, within a second vehicle, or on the ground. Thus, fixed-wing aircraft, remotely piloted vehicles, and satellites would all be aerospace vehicles.

This characteristic is neither new nor startling. Air Force documents that discuss the flexibility of air power assume the ability to change targets or locations—to exercise intelligence within the weapon platform.⁵ Further, many of the operational capabilities attributed to aerospace operations such as mobility, responsiveness, survivability, and presence have their basis in this characteristic.⁶ Originally, intelligence was resident in the airman operating the aircraft. Today, although the weapon system remains intact, it can be supplemented by artificial intelligence and ground-controlled systems.

Application of the Characteristics

Taken together, these two characteristics provide a basis for development of future aircraft. A sampling of air power instruments that exhibit these characteristics include helicopters, missiles, remotely piloted vehicles, satellites, and fixed-wing aircraft. Although this list is not exhaustive, it does provide a useful frame of reference. Each of the "air forces" in the US military uses some of these instruments. No service, however, includes all of them in the development of its doctrines or operational concepts.

To date, distinctions made between aircraft (e.g., fixed-wing aircraft versus helicopters) for the purpose of dividing them among the services have been artificial and transitory.⁷ Because of the technological developments taking place in the aerospace industry, clean lines of demarcation between various aircraft are not always possible or practical. For instance, the airlift resources of air power have been augmented and enhanced by the helicopter. In a short time, this vehicle has matured into a

workhorse on the modern battlefield, assuring a degree of mobility that only air power can deliver.⁸ The technologies of vertical and/or short takeoff and landing (VSTOL) will further blur the distinctions among the tools of air power.

Aerospace Military Capabilities

The characteristics of environment and intelligence set air power apart from land and sea forces. Once this distinction is made, we can begin to define the role of air power. As a basis of discussion, we can focus on the military capabilities of air power. Typically, air power enthusiasts have concentrated on the massive destructive potential of air power—strategic bombardment.⁹ However, the capabilities of air power must be viewed against all of the ways it has been used in the past, in light of the way the term is defined.

Historically, air power has been employed to accomplish projection, denial, and oversight. Rather than attempting to provide an inclusive definition, we will refer to these functions as military capabilities. They form a powerful triad from which roles and missions can be developed. Each represents a valuable element of air power that must be recognized in the employment of aircraft.

Projection

The great part of modern air power theory and doctrine has been directed toward the capability of projection. In this context, projection is the ability to place military force at a given location at a certain time. This definition is intentionally general. A variety of methods are used to focus military power. The obvious Air Force method is through bombardment. A less obvious but equally important method is the projection of land forces through airlift. The mobility that the Army enjoys today is a result of the projection of force by helicopters and fixed-wing aircraft.¹⁰ Commonly accepted practices

such as close air support, interdiction, and strategic bombardment are all variations of this capability. The important aspect of projection is the placement of military force—in whatever fashion—in a given amount and at a specified time and place.

Denial

The companion to projection must be denial. This capability entails denying an adversary freedom of action. Whereas projection was strictly offensive, denial involves a mixture of offensive and defensive actions. On the one hand, this capability tends to be defensive insofar as it prevents enemy actions. Many people consider the Battle of Britain a classic example of such denial.¹¹ On the other hand, offensive actions such as those involved in attaining air superiority are also integral parts of denial. Certain elements of interdiction and close air support may also fall into this category. Through movement of forces and resources, even airlift can deny territory or freedom of action to an adversary.

Oversight

Perhaps the most used but least considered military capability of air power is oversight. Simply stated, oversight involves watching or guarding to assure proper direction and control. The use of reconnaissance aircraft and satellites to observe foreign military developments and to protect the United States is a significant and critical contribution of air power. Clearly, this capability uses the impact of visibility to influence the actions of hostile governments. For example, the satellite observation that goes on worldwide is a key ingredient in the military power of the United States and a critical component of foreign policy.¹² Furthermore, the movement of E-3A aircraft into a region sends an assortment of political and military signals. One of the crucial components of any arms reduction agreement is the ability of the United States to exercise this military capability. Oversight may

cause governments to behave differently—to change their military plans.

Application of Military Capabilities

These capabilities work in concert to support specific air power missions. Missions are simply statements of military objectives that form the basis for force structures.¹³ These objectives can be attained through exercising military capabilities. In short, any mission contains a mix of these capabilities. Hence, these capabilities establish a foundation for building mission statements and force structures.

In each mission, one capability dominates while the others assume supporting roles. Only through utilization of all capabilities can the mission be completed. In air interdiction, for example, projection is the dominant capability. However, denial is necessary to suppress enemy defenses—to allow freedom of movement—and oversight is needed to acquire target information and evaluate the success of the mission.

Application Environment

These characteristics and capabilities are important only if they help us apply air power. In the final analysis, theory must be of some practical use. Air power leadership functions within the application environment, a broad structure for the practical application of air power theory. To the military leader, this environment consists of two primary considerations: the spectrum of conflict and the national policy. It is within this environment that air power must be effective and responsive.

Spectrum of Conflict

The nature and intensity of conflict vary substantially from event to event. Although air power proponents have traditionally focused on nuclear or conventional roles, there are many other kinds of conflicts that require US forces. In point of fact, there is a

recognized spectrum of conflict (see figure) that categorizes these different forms of warfare. Conflicts can range from low intensity, such as show-of-force operations and surgical strikes, to high intensity, such as general conventional or nuclear war.¹⁴

The spectrum of conflict defines the operational environment for the military planner. Determining the nature of a conflict and the appropriate military options is the purest form of military art. This military assessment of the appropriate strategies, tactics, and tools is performed against the backdrop of the conflict. The tempo and intensity of operations as well as required force strengths to carry out these operations are key factors defined by the nature of the conflict.

National Policy

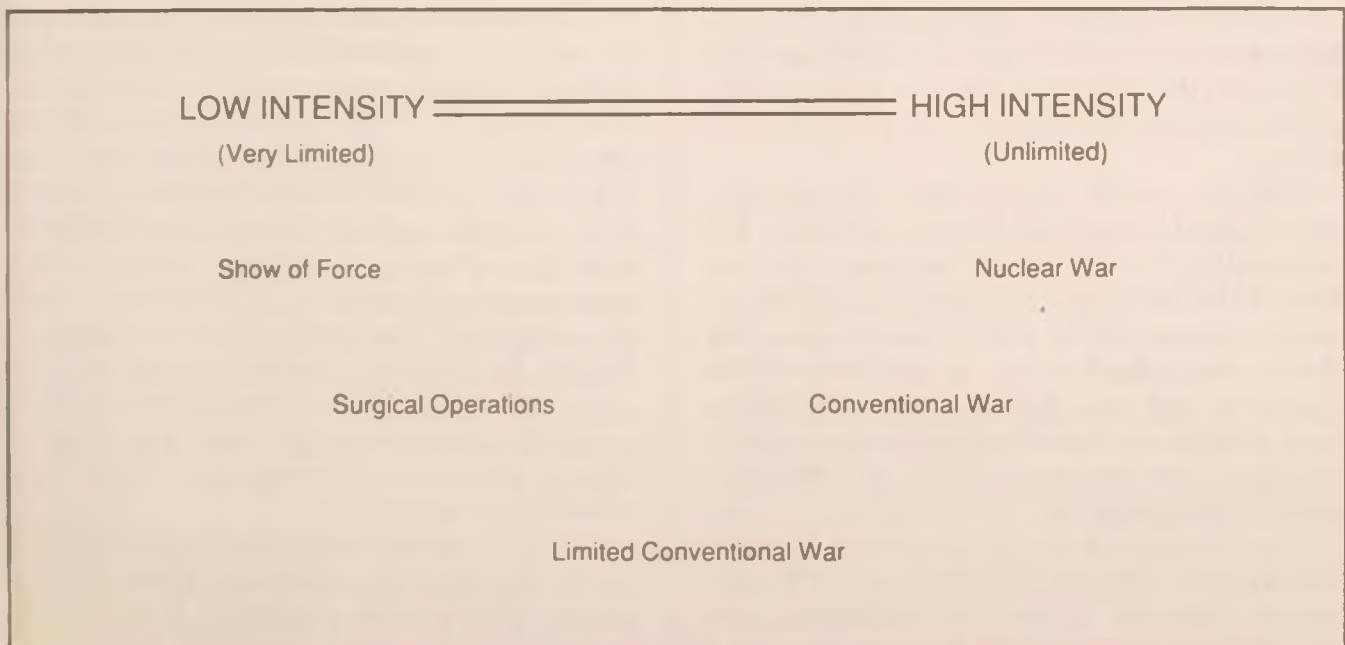
Air power is effective—and, for that matter, needed—only to the extent that it supports and furthers national policy. Implicit in that statement is the idea that the sea, air, and land forces operate in concert rather than in opposition. Military forces, in this context, are used to “influence” another

country or group to act in a certain manner.¹⁵ Whereas the spectrum of conflict determines the appropriate military response, the national policy dictates the level and scope of military involvement in any given situation.

To the military leader, national objectives describe the political framework within which military power will be used. These objectives define the terms of success or victory and must be consistent. Key military variables that are dependent upon the political environment include the level of force, duration of the conflict, degree of freedom for the military forces, and, possibly, the forces to be used.¹⁶

Air Power and the Environment

The spectrum of conflict and the national policy both define the application environment for the air power planner. The characteristics and capabilities of air power provide a framework to develop aerospace options within this environment. The characteristics are important in identifying the wide range of tools available to accomplish air power missions. The military capabilities provide a means of assessment for struc-



Source: Adapted from David J. Dean, *The Air Force Role in Low-Intensity Conflict* (Maxwell AFB, Ala.: Air University Press, October 1986), 3.

turally developing air power missions commensurate with the demands of the conflict and the nation.

Employment of Air Power

To this point, the discussion of air power has been theoretical. With the real-world framework or application environment established, however, the actual employment of air power against that framework can be developed. The remainder of this article elaborates upon a concept for mission development, discusses this concept in greater detail through the use of one example, and summarizes the key elements of this discussion.

Mission Development

Mission development begins with a conflict. The spectrum of conflict is useful in determining the nature of a particular conflict and its possible resolution. The purely military options can be ascertained through this process. However, only after a national policy has been established can military planners begin to assign forces or build a force structure to support that policy. Air theorists, working with their counterparts from the land and sea forces, must develop air power missions. Following the identification of the conflict and the development of policy, the air power planner defines missions and builds forces to implement the policy.

The air power capabilities (projection, denial, and oversight) form a structure for developing the air power mission. The nature of the air power mission (e.g., offensive versus defensive or active versus passive) determines which of the capabilities will be the dominant one. Although one capability may dominate, the others assume supporting roles and are essential to the development of the mission.

The characteristics of air power identify the weapon systems that implement the air power mission. These characteristics are helpful in determining the number and types of instruments available for use. Fur-

ther, care must be taken to consider the capabilities of the tool rather than its common use. The role of the bomber, for example, has evolved to include nuclear, conventional, tactical, and strategic missions.¹⁷ The air power planner can, from a list of possible systems, use a mix of systems that best supports the military capabilities sought and thereby meets the mission needs.

Example of Mission Development

To put all of these details into some perspective, let's consider a simplified case. Assume that the type of conflict is nuclear war. In the pure military sense, there are a variety of ways to protect the nation from and possibly win a nuclear war. Preemptive nuclear strikes, defensive missile systems, and a number of other options are possible solutions. However, the national policy must also be taken into account. Assume that the national leadership has a policy of strategic nuclear deterrence. That is, the leadership wants to prevent an attack on this nation solely through its ability to counterattack and devastate any nation that attacks it. How would this air power mission be developed?

To perform this mission of deterrence, the air power planner relies on a blend of projection, denial, and oversight. The dominant capability is offensive, most probably the military capability of projection. The other two capabilities are directed in ways that support and facilitate the dominant one. Projection is essential to carry out the response to an aggressor. This action is what the national leadership has demanded. Denial is added to deflect enemy attacks against the projection forces. Observation or oversight is necessary for early detection of enemy attacks and to assist in the targeting of mobile enemy forces.

The air power planner builds the needed force structure by choosing from the air power instruments available. The characteristics of air power are useful here. Environment and intelligence allow the air

power planner ample tools to fulfill the national policy objective. For instance, the capability of projection is achieved through the use of manned aircraft, satellite systems, and missiles. The forces to conduct denial make use of similar systems designed to obstruct or deflect enemy forces. Finally, satellites, remotely piloted vehicles, and manned aircraft would be appropriate to perform the oversight function.

Key Elements

Three key elements are central to this discussion. First, the element of national policy remains influential throughout the process. For example, some air power instruments may not be acceptable to the national leadership. Second, the military capabilities provide a structure for examining any mission. Together, they cover the abilities of air power. Third, the characteristics assure that planning will have at its disposal the total inventory of air power instruments. Further, this discussion focuses entirely on the broad mission of air power and largely ignores tactical matters. The methods for getting through an opponent's defenses or the appropriateness of certain air power instruments are not in question here. Those decisions are left to the technical expertise of the airman.

Conclusions

When the early proponents of air power were developing their theories, few aircraft existed. The lessons of combat were not available. Therefore, their theories were based on what they thought air power could accomplish. Many of these theories (which formed the basis of our doctrines) were based on very specific views of future conflicts.

Over the past 70 years, the entire science of warfare has undergone massive changes. Air power has evolved into a fighting force in its own right. Those fragile biplanes have been replaced by a variety of jet aircraft,

missiles, and helicopters. The explosion in technology that created these systems continues unabated. The air power forces of tomorrow may have as much in common with air forces today as current aircraft have with the biplane.

Because the role of air power will continue to evolve as it matures, its doctrinal foundations must be broad enough to allow for the maturation process. The spectrum of conflict and national policy establish the context within which air power will be used. The characteristics and the military capabilities of air power provide a broad basis for future growth—and for the future of air power.

Thus, it falls to the practitioner of air power to escape the artificial constraints of the past and develop the air medium broadly on the basis of the doctrinal framework delineated here. Reconsider those initial questions: What is air power? How does it fit into modern warfare? We now have a means to answer them. □

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Modified to Meet the Need

British Aircraft in the Falklands

CAPT JOSEPH F. UDEMI, USAF



*In peace there's nothing so becomes a man
As modest stillness and humility;
But when the blast of war blows in our ears,
Then imitate the action of the tiger.*

—Shakespeare, *Henry V*

LIKE Shakespeare's placid character, Great Britain was shaken out of its lethargy in 1982 when Argentina invaded the Falklands (Islas Malvinas), an island group in the South Atlantic claimed by both Argentina and Britain but occupied by the British. Ground, sea, and air forces of the Bard's homeland did indeed imitate the action of the tiger in fighting for control of the islands. Meanwhile, back in Britain, military and industrial engineers and technicians hurriedly modified military aircraft to meet the requirements of the war effort. At the time of the invasion, Britain was at a disadvantage in the critical areas of available fighter aircraft, long-range airlift aircraft, instruments for conducting electronic warfare, and devices for aircraft surveillance. This discussion examines various aircraft modifications or improvisations Britain hastily undertook to meet the needs created by shortfalls or by Argentine threats. Many of these changes were completed in a matter of days or weeks. In peacetime, comparable modifications and improvisations performed in Britain or the United States might have taken years. Since the conflict lasted only two and one-half months (2 April to 14 June 1982), some of these aircraft modifications were not completed before the cessation of hostilities. Others were completed with various degrees of success and made contributions in combat. The effectiveness of the program is evidence of the ingenuity, inventiveness, and resourcefulness of the British government, military, and industry.

Although Britain responded to the "blast of war," prior to the crisis the country was very much like Shakespeare's man in peacetime. During previous years, Britain had elected to maintain its contributions to the North Atlantic Treaty Organization (NATO) rather than support a worldwide defense commitment. Consequently, the Royal Navy was hit especially hard by budgetary cuts.¹ In fact, plans were made to eliminate its two operational aircraft carriers by scrapping HMS *Hermes* and selling HMS *Invincible* to Australia. Two amphibious assault

ships were also considered expendable.² Fortunately for Britain, these vessels were still available when Argentina invaded. Britain also was proud of the vertical and/or short takeoff and landing (VSTOL) capability of the British Aerospace (BAe) Harrier and Sea Harrier aircraft, designed to defend air and sea. However, opponents of the aircraft claimed that their weapons load was too small, that they were too slow for modern air warfare, and that there were too few of them to be effective against an enemy.³

Meeting the Superior Numbers

Argentine aircraft greatly outnumbered the Sea Harriers of the Royal Navy's air arm. Together, the Argentine air force and naval air arm had approximately 110 fighter and fighter-bomber aircraft. Posing the greatest threat to the British were 11 French-built Mirage IIIs and five Super Etendard aircraft. Argentina also boasted 57 American-built A-4 Skyhawk fighter-bombers and 34 Israeli-built Mirage Vs (called Daggers by the Argentines).⁴ These aircraft operated out of several air bases on the Argentine mainland, the closest being 380 miles from the islands and the farthest 517 miles. Although the long distances meant that some of the aircraft would be operating close to the end of their combat radius and their loiter time over the islands would be limited, they still posed a substantial threat to the ships of the British task force and to Sea Harrier aircraft.⁵

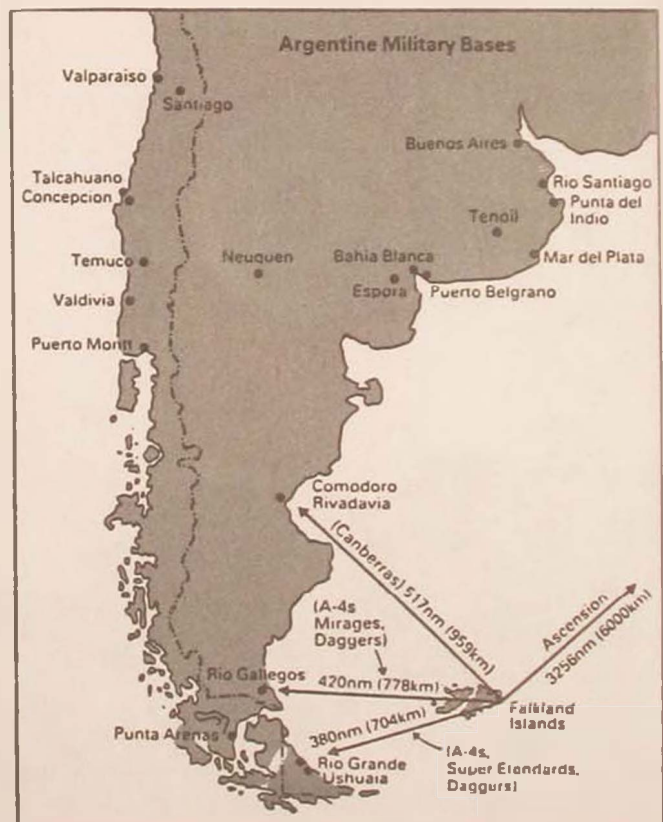
To supplement its fighters, Argentina deployed 34 short-range attack aircraft of various types to the islands. Adding over 100 reconnaissance, transport, helicopter, and support aircraft brought the total combined Argentine air strength to approximately 250 aircraft.⁶ Initially, the British aircraft facing this Argentine force included 20 Sea Harriers on board the carriers *Hermes* and *Invincible* together with 53 helicopters on the carriers and other warships of the task



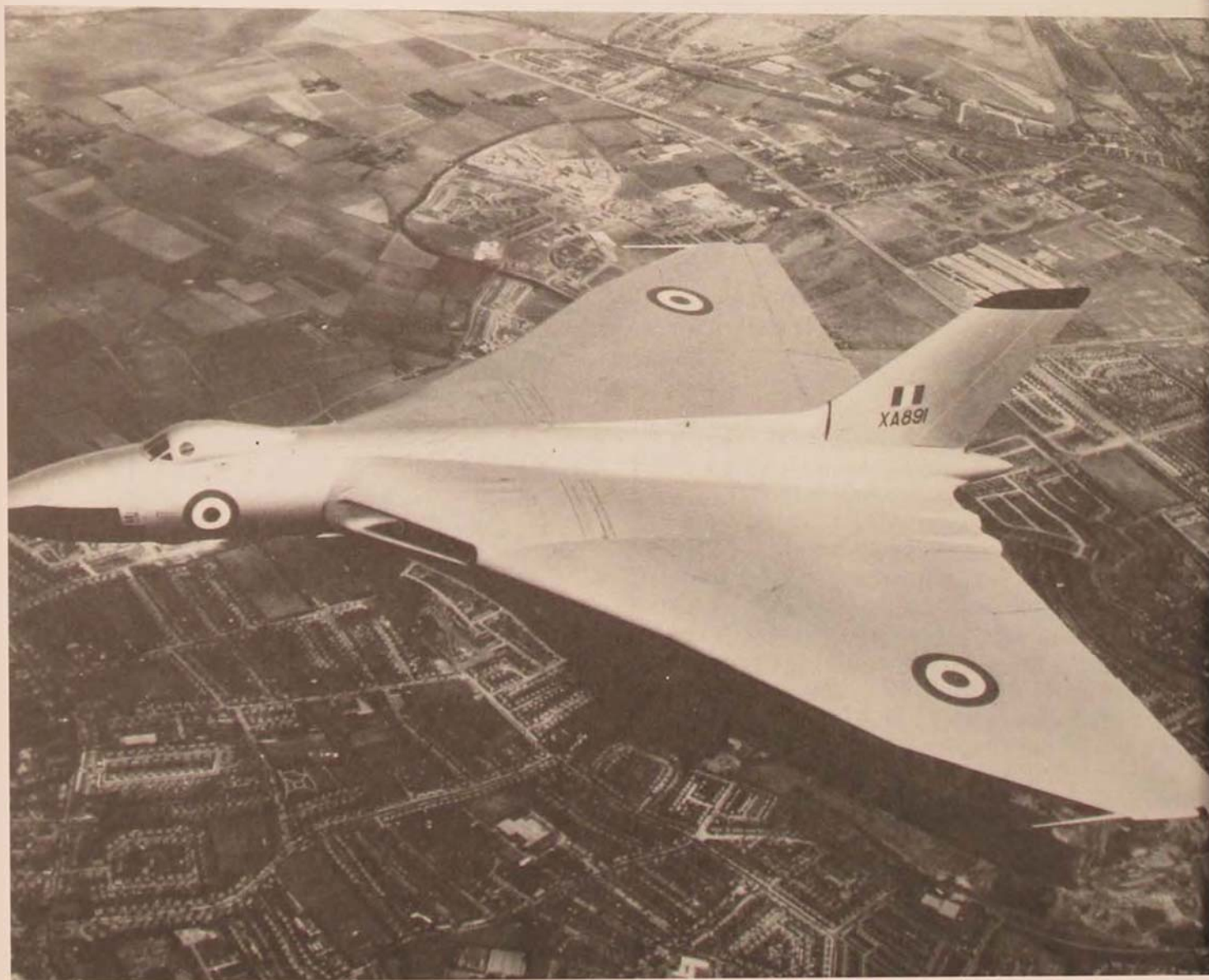
Because British forces were committed to supporting NATO rather than maintaining a global defense posture, the Argentine invasion of the Falkland Islands caught them unprepared. Although Argentina's warplanes operated out of bases far removed from the islands (right), they posed a formidable threat to British forces.

force.⁷ The Argentine threat was even greater than that suggested by their superiority in numbers because the Sea Harrier was unproven in combat and could not fly as fast as the Mirage, Super Etendard, or Dagger fighters.⁸ The British aircraft, however, did have an advantage in weaponry since it was equipped to use the AIM-9 Sidewinder heat-seeking, air-to-air missile.⁹

Obviously, the task force needed more aircraft as soon as possible. At the beginning of the war, only 31 Sea Harriers were in existence, and three were lost in the first week. Because some of them were kept in England



The Royal Air Force Harrier GR.3 (right) was designed as an air-to-ground aircraft but had to be converted for air-to-air operations as well as for maritime duty (opposite page). RAF Vulcan bombers (below) were ready for retirement when called into service for conventional bombing. Technicians fitted these aircraft with navigation systems for long-range over-water flights and with electronic countermeasures systems for protection from Argentine air-defense weapons.





for evaluation and testing, a mere eight aircraft were available to reinforce the task force. The only alternative was to use the Royal Air Force's (RAF's) Harrier GR.3 aircraft.¹⁰ This decision entailed the formidable task of converting the air-to-ground GR.3 to an air-to-air craft capable of shipboard operations. On 8 April the Harrier GR.3s of No. 1 (F) Squadron were selected to undergo a series of modifications that would take four weeks to complete before deploying to the *Hermes* and *Invincible*.

The Argentine threat to the British task force was significant. A lack of airborne early warning capability left the fleet vulnerable to air attack. Below is an artist's depiction of an Argentine A-4 engaging a British warship.

Subsequently, the GR.3s would augment the Sea Harriers in the air defense mission and eventually conduct ground support attacks.¹¹

Between 14 and 16 April the British Ministry of Defence (MOD) and BAe compiled a modification list for the GR.3s. Some of the changes facilitated shipboard operation while others accommodated the South Atlantic environment.¹² For example, to secure the GR.3s to carrier decks, technicians fitted tie-down shackles to the aircraft's outrigger legs and modified the nosewheel for better steering control on deck.¹³ They also drilled drainage holes in the aircraft and sealed other areas to keep out corrosive salt water.¹⁴

The GR.3s also needed I-band transponders, which would emit a precoded identi-



fication transmission when interrogated by an I-band radar signal, thereby clearing the aircraft for recovery by the carriers. BAe delivered the first GR.3 transponder modification kits only eight days after the MOD's request. Technicians then installed each transponder and its antenna in an access panel under the aircraft's nose.¹⁵ The speed with which BAe produced these kits was typical of the cooperation between industry and government during the crisis.

Another example of industry's commitment was the development by Ferranti Ltd. of support equipment to align the GR.3's inertial navigation-attack system (INAS). The INAS's accelerometers provide the pilot information about altitude, navigation, and bombing by calculating velocity and changes in position. To provide accurate

data, the INAS must be properly leveled and aligned before takeoff.¹⁶ Sea Harriers have a different navigation system that compensates for the ship's movement, but there was no time to install this system in the GR.3. Faced with the impending GR.3 deployment to the carriers, MOD requested technical help from Ferranti.¹⁷

Ferranti officials discussed the project on 15 April and received the go-ahead from MOD the next day. Two days later a design for the Ferranti inertial rapid alignment

The Argentines' A-4 Skyhawks as well as the French-built Mirage III (below) and Super Etendard proved to be lethal weapon systems. British ground forces also had to worry about the Argentine-built Pucará (bottom).



equipment (FINRAE) was complete. FINRAE—developed and delivered in only 18 days—is a lightweight, trolley-mounted, battery-powered platform that can interface with the GR.3's INAS and feed it positional data. The acquisition of FINRAE's trolley is typical of the speed with which the project was completed. The manufacturer originally quoted a delivery time of six months, but after being told why the trolley was needed, delivered it the next morning.¹⁸ Because the FINRAE's navigational data was not as accurate as information available from airfields, the GR.3s used FINRAE for attitude information only. This restriction forced the crew to use visual navigation for weapons delivery during low-level operations. After the conflict, FINRAE was further tested and eventually produced accurate and timely alignments.¹⁹

Lastly, the GR.3 had to be modified to carry the AIM-9 Sidewinder missile. On 16 April MOD indicated that this modification—the most involved of all the changes to the GR.3—would have to be completed in two weeks. By 21 April BAe and RAF engineering officers had developed a conversion plan, and MOD approved it the following day. The first conversion was completed at RAF Wittering on 28 April.²⁰ Adapting the GR.3 to carry the AIM-9 required technicians to install an electronic relay box in the rear equipment bay and a missile control panel in the cockpit. They made only a few changes to the existing armament wiring in the wings leading to the outer pylons but modified an adapter that allowed the missile launch rail to be attached to the pylons. After 18 AIM-9 modification kits were produced, technicians modified 11 aircraft initially.²¹

Several factors contributed to the speed and success of the AIM-9 program. The RAF, plans in hand, had asked for similar modifications but funding was not forthcoming. Further, the program benefited from the exceptional cooperation and joint effort of the BAe design team from Kingston, the RAF Engineering Wing at Wittering, and officials from the test establishments at

Farnborough and Boscombe Down. Lastly, the need for additional British aircraft in the South Atlantic tended to overcome previous funding difficulties.

Six modified GR.3s and eight Sea Harriers flew to Ascension Island where they were loaded on board a containership, eventually joining the task force on 18 May. Before the hostilities ended, four additional modified GR.3s reached the task force after in-flight refueling by Victor tanker aircraft.²² Despite the intense effort to modify the GR.3 to carry the AIM-9, these missiles were off-loaded after their first operational mission because the Argentine air threat to the Harriers had not materialized as anticipated.²³ The success of Sea Harriers armed with AIM-9s in aerial combat persuaded Argentina to refrain from risking any more aircraft.²⁴ The GR.3s were therefore employed in low-level ground attacks and reconnaissance missions, mostly in support of amphibious landings and battlefield air interdiction.²⁵

Meeting the Long Distances

Just as Britain was the United States' largest "aircraft carrier" for striking at Germany during World War II, so had Ascension Island become Britain's largest aircraft carrier in its war with Argentina. During the conflict, Wideawake Airfield on Ascension became one of the most active fields in the world.²⁶ Located almost halfway between Great Britain and the Falklands, Ascension was logistically crucial for a task force that was operating far from home and for an air force that would help to keep it supplied.²⁷

To comprehend the resupply task facing the RAF, one must review the overwater distances involved versus the RAF's airlift range capability. The distance from Great Britain to Ascension Island is over 4,000 miles and from Ascension to the Falklands another 3,500 miles.²⁸ Fifty-four C-130 Hercules aircraft were the mainstay of the RAF airlift strength.²⁹ These aircraft had an ap-

proximate range (depending on configuration) of 3,000 miles and no in-flight refueling capability.³⁰

To reach Ascension from Great Britain, a C-130 had to make en route stops at Gibraltar, Dakar (in Senegal), or Banjul (in Gambia). The airlift missions to Ascension began on 2 April. The missions continued and helped supply the task force when it passed through Ascension in mid-April.³¹ Unless their range could be extended, the C-130s were able to reach only 1,500 miles beyond Ascension to perform airdrop missions to resupply the task force.

The most available means to extend the C-130's range was through the use of cylindrical auxiliary fuel tanks installed in the aircraft's fuselage. Earlier cargo aircraft had used long-range fuselage tanks; therefore, the concept was not new. The Engineering Wing at RAF Lyneham revised this concept and reclaimed the old fuselage tanks from storage.³² In a matter of days the first modified C-130 was ready for flight test. Two or four tanks could be installed in a cargo bay of the C-130 to extend flying time; however, the trade-off was a decreased payload.³³

The long-range tanks allowed C-130s to deploy to Ascension without en route stops. The first converted aircraft reached Wideawake Airfield on 5 May. From 7 to 18 May, various airdrop missions were flown by several aircraft from Ascension, with the longest flight lasting 18 hours.³⁴

The extended-range C-130s were an interim solution to the airlift problem. A more permanent solution involved giving the C-130 an in-flight refueling capability. As with other conflict-related modifications, an initial design study had been conducted years before, but the effort never materialized. Unlike the fuselage tank modification, this effort exceeded RAF Lyneham's capability. With a real need now present, Marshalls of Cambridge Engineering Ltd. (MCE) began work on 15 April. Initial estimates for this modification were three weeks; however, the first aircraft was modified and ready for testing in 10 days.³⁵

In-flight refueling nozzles and probes

from retired Vulcan bombers were installed on top of the fuselage above the C-130's cockpit and offset to the right. Fuel lines were placed along the fuselage roof from the probe to the trailing edge of the starboard wing root and into the aircraft's fuel tanks.³⁶

Following flight tests at Boscombe Down, the first modified C-130 (designated C.1P) deployed to Ascension on 14 May. Between 16 May and 14 June, 18 air-refueled airdrop missions were flown from Wideawake to the task force over 3,000 miles away. After hostilities in the islands ended, the airdrop missions continued, and one C.1P set an airborne endurance record of 28 hours and 4 minutes. Six C-130s were converted to C.1Ps before 14 June, and 10 more were completed after that.³⁷

During this time, the demands on the Victor tanker aircraft increased, and the need for additional in-flight refueling support became apparent. On 30 April, MCE began work on modifying the C-130 to function as an in-flight refueling tanker. This modification was complex and risky because the C-130 rear cargo door would require extensive work to hold a refueling unit and a refuel hose had never been trailed from the aircraft's fuselage.³⁸

Despite the complexity of the modification, a C-130 tanker (C.1K) made its first flight on 8 June, only 38 days after the requirement was initiated. It encountered buffeting problems, a technical problem that delayed the operational delivery of the C.1K until 5 July.³⁹

The contribution of the C-130 Hercules to the British war effort can be summed up by its 44 airdrop missions and over 13,000 flying hours. Successful and timely fuselage tank and in-flight refueling modifications enabled the C-130s to perform nonstop deployments to Ascension and essential airdrops. A total of six C-130s underwent the tanker conversion; however, none of them saw operational service. These aircraft did play a role in future deployments to the British Falkland garrison.⁴⁰

Another aircraft that would play an important role in the recovery of the islands

was the RAF's Nimrod MR.MK2 maritime reconnaissance aircraft. The Nimrod, equipped with various computer-assisted radar and acoustic systems, was used to perform a variety of essential missions.⁴¹ The Nimrod roles included airborne patrols to protect Ascension Island and the task force, search-and-rescue missions during Harrier deployments, and a communication link for air-to-air refuelings and bomber missions.⁴² The Nimrod had to cover all operational areas; however, it had a range of about 5,500 miles and could not be refueled in flight.⁴³

The Nimrod, like the Hercules, underwent a rapid modification to allow in-flight refueling. BAe was given the go-ahead on 14 April to begin modifications, and work began four days later. On 27 April, a modified Nimrod flight-tested the aerodynamics of the aircraft and its newly installed refueling probe (which had been removed from a Vulcan bomber). These tests revealed a yaw-instability problem that was later solved by installing finlets near the aircraft's tail.⁴⁴ The first Victor/Nimrod linkup occurred 30 April, and the first completely modified aircraft was available on 2 May.⁴⁵

The Nimrod modification consisted of a refueling probe attached above the cockpit with a fuel hose extending down to the cabin floor. This canvas-on-rubber, flexible bowser hose then ran along the cabin floor for two-thirds the length of the fuselage.⁴⁶

Thirteen Nimrods were modified during the conflict, and three more were completed afterwards. The first refueling mission for a Nimrod from Wideawake took place on 9 May. The in-flight refueling modification allowed the Nimrod to perform valuable long-range reconnaissance missions almost to the Argentine coast. On 15 May, a Nimrod flew 8,453 miles, the longest distance flown by an aircraft during the conflict.⁴⁷

Meeting the Electronic Threat

The conflict was reminiscent of the many wars Britain fought throughout the centu-

ries to maintain its empire. This war was fought for old principles but with the latest military technology. In the Falklands, British aircraft would face a variety of modern European and American electronic weaponry. The British had to rely on hasty improvisations to counter the electronic threat.

The greatest air-to-air threat came from the Mirage III aircraft. The Mirage could carry two Matra Magic R550 heat-seeking missiles or one Matra R530 semiactive radar-homing missile.⁴⁸ Any aircraft going against a Mirage III would need to protect itself from these missiles.

To defend against air attacks, the Argentinians had placed several types of radar-controlled anti-aircraft weapon systems on the islands. Potentially, the most lethal of these systems was the European-built Roland missile with its radar-guidance and fire-control system. Ironically, a further threat came from two British-built weapons, the Tigercat and Blowpipe shoulder-fired surface-to-air missiles (SAMs).⁴⁹

In addition to the missile systems, several radar-controlled anti-aircraft artillery (AAA) systems made low-flying sorties dangerous. The most sophisticated AAA system was the Oerlikon 35-mm twin-barrel cannon, directed by the Contraves Skyguard all-weather, fire-control radar. Finally, the Argentinians possessed a number of optically directed Rheinmetall 20-mm and Hispano-Suiza 30-mm cannons.⁵⁰

Providing the Argentinians with vital early warning of impending air strikes and aiding defensive fighter coordination were a Westinghouse AN/TPS-43F three-dimensional, long-range surveillance radar and a supporting Cardion AN/TPS-44 tactical surveillance radar.⁵¹ These radars could track Harrier aircraft, determine the location of British ships, and advise attacking Argentine aircraft.⁵² Britain would later dedicate several air strikes to the destruction of these important radar systems.

At the time of the conflict, British aircraft did not have electronic countermeasures (ECM) equipment despite the probability

that potential adversaries would possess a varying range of modern electronic warfare (EW) capabilities. British attempts to fill this ECM shortfall would therefore involve protection for its aircraft and elimination of radar threats.

Modifications to protect Harriers took the form of a chaff flare dispenser and a self-protection radar jammer. Chaff consists of bundles of radar-reflecting aluminum strips that confuse an enemy's radar when released. Infrared decoy flares are used to deflect heat-seeking missiles from an aircraft's exhaust.

Initially, chaff bundles were crudely wedged between the Harrier's bombs and pylons and between the speedbrake and the fuselage. After US aid to Britain was approved, the Tracor Company, a US defense contractor, assisted in installing the ALE-40 chaff flare system in a modified ventral access panel under the Harrier's rear fuselage, aft of the speedbrake.⁵³

The production of an ECM pod was another effort to protect the Harrier. The hurried project to build the ECM pod (commonly called Blue Eric) was begun by the Marconi Space and Missile Defense System and RAF electronic warfare experts. In peacetime a project of this magnitude and complexity would have taken at least two years. After only two weeks, nine pods were ready for service.⁵⁴

The project actually began on 6 May, when RAF and Marconi EW experts identified the characteristics of the Argentine radar threat and decided how to counter it. They determined that existing ECM pods were too big and heavy to be used on the Harrier.⁵⁵ On the following day, they elected to use one of the two Aden underbelly gun pods for the ECM equipment rather than build a new pylon-mounted pod. BAe was brought into the project to coordinate the interfacing of the pod and the aircraft's electrical system. Within five days, Marconi had completed the design work.⁵⁶

The system's electronic components came either from the Marconi Skyshadow pod, were off-the-shelf items, or were spe-

cially manufactured. Rather than use the normal liquid-cooling system, engineers installed ram-air cooling. On 12 May, the prototype pod was complete and ready for ground testing.⁵⁷

Flight testing began on 14 May and included evaluating the pod's performance in place next to the pod of an Aden gun that was actually firing. Also under consideration was whether the electrically fired 30-mm ammunition could be safely exposed to any energy the pod might radiate. No problems were discovered, and the pod was declared ready for operational use. Marconi produced a total of nine Blue Eric pods within four days. Only 15 days elapsed from initial requirement to delivery.⁵⁸

Other modifications involved preparing the venerable Vulcan bomber for its sorties to the islands. The Vulcans were used in several conventional bombing attacks on the Port Stanley airfield and in missile attacks on the Argentine radar sites.⁵⁹ The Vulcans were fitted with the Carousel inertial navigation system (INS) for their long-range overwater missions, and their supporting Victor tankers were supplied with the Carousel INS or the Omega radio navigation system.⁶⁰

To protect itself against Argentine radar, the Vulcan was given the Westinghouse AN/ALQ-101 ECM pod. These pods were mounted on locally devised underwing pylons, and the wiring was routed through unused refrigeration ducts. The ALQ-101 pods were used to jam Argentine radar during the Vulcan's Black Buck missions against the Port Stanley airfield and radar sites.⁶¹

In order to destroy the Argentine AN/TPS-43F and TPS-44 radars, the RAF decided to equip the Vulcan with US-supplied AGM-45 Shrike antiradiation missiles. A total of four Shrikes could be mounted on the Vulcan.⁶² Shrike missile attacks on the radar sites destroyed one AAA Skyguard radar. Despite the tremendous effort made on the Black Buck missions, the two Argentine surveillance radars remained functional until hostilities ended.⁶³

The ALQ-101 pod and the chaff bundles did provide some protection to the Vulcan and the Harrier, although the exact contribution of these measures is difficult to assess. Three GR.3s and one Sea Harrier were lost to AAA fire. Only one Sea Harrier was lost to a Roland SAM. No Harriers were lost in air-to-air combat, and no Vulcans were lost.⁶⁴

Although a commendable effort went into the Blue Eric jammer pod, it was never used in combat. The four GR.3s equipped with Blue Erics arrived late in the conflict and flew only missions clear of radar defense. The Blue Eric effort, however, provided the RAF and industry a great lesson in rapidly producing ECM equipment and ECM technology for the Harriers. It helped justify the need to the British for an indigenous defense industry. The Blue Eric project had also cost considerably less than it would have if it had been a two-year peacetime contract.⁶⁵

Defending the Task Force

The British task force arrived in the South Atlantic with a serious deficiency. It lacked airborne early warning (AEW) capability, and therefore its ships were vulnerable to surprise attack by Argentine aircraft. This vulnerability was quickly realized when HMS *Sheffield* was unexpectedly hit by an air-launched, French-built Exocet missile on 4 May.⁶⁶ Unfortunately, the British learned the value of AEW in modern warfare the hard way.

In addition to the Argentine air attacks, there was also the surface threat. The Argentine navy possessed one aircraft carrier, one cruiser, seven destroyers, three frigates, and numerous patrol and attack craft. All ships were armed with a variety of naval weaponry, approximately nine of them having the ship-to-ship Exocet missile.⁶⁷ The British had no way of knowing whether or not Argentina would commit its naval forces to

battle; thus, this threat would have to be dealt with.

There were no immediate solutions to the lack of AEW. It was too impractical to refurbish the Royal Navy's several retired Gannet AEW aircraft.⁶⁸ The 1950s-era Shackleton AEW aircraft could not help, and an AEW version of the Nimrod was several years away.⁶⁹ Once again, a modification effort would be undertaken to meet the need for an AEW capability.

The ideal solution would be to have an AEW aircraft that could operate from the task force. Westland had previously done design studies on an AEW version of its Sea King HAS.2 helicopter; therefore, on 23 May, MOD gave Westland approval to commence with the conversion.⁷⁰

Two Sea Kings were fitted with the Nimrod's Thorn-EMI search-water maritime surveillance radar. The large, unsightly looking radar dome was mounted on an external swivel arm extending from the rear starboard of the helicopter's fuselage.⁷¹

The two AEW Sea Kings were cleared for operation and deployed on HMS *Illustrious* on 2 August, only 11 weeks after initial planning began.⁷² Despite another commendable conversion effort, these Sea King helicopters were too late to help prevent the loss of British ships to surprise air attacks.

The task force did have the advantage of Nimrod aircraft providing valuable reconnaissance and antisubmarine duties as they headed for the South Atlantic. After the Nimrod's range had been extended by in-flight refueling, it was able to perform long-range reconnaissance sweeps. The first of these missions occurred on 15 May, and its track was within 60 miles of the Argentine coast. These missions were important, but they were also very risky for the unarmed Nimrods flying in unfriendly skies.⁷³

The Nimrod proved to be a versatile aircraft with the capability of carrying both air-to-air and air-to-surface weapons. It had originally been designed with two underwing hard points and a weapons bay. After suitable pylons and wiring had been designed, AIM-9 Sidewinder missiles were

mounted on the Nimrod. The first AIM-9-armed Nimrod deployed to Ascension on 5 June.⁷⁴

The Nimrod's weapon bay was also modified to carry the American AGM-84A Harpoon antiship missile. The first Harpoon-equipped Nimrod deployed on 2 July. Neither the Sidewinder nor the Harpoon conversions were ever used in combat.⁷⁵

Despite the effort to defend the task force, the British suffered the loss of six ships, with an additional 11 ships damaged. Losses would have been greater, but many of the Argentine bombs failed to explode.⁷⁶ The lack of AEW proved to be the task force's Achilles' heel. The AEW Sea King helicopter came far too late. The Nimrod was a valuable surveillance asset even though its armed versions were never validated. In the end, it was fortunate for the British that the Argentine naval capabilities had been negated by the British nuclear submarine threat.⁷⁷

Conclusion

The modifications that had the greatest direct contribution to the war effort were adapting the Harrier GR.3s for carrier operations, providing the Hercules and Nimrods with in-flight refueling capability, and installing improved navigation equipment on the Vulcan and Victors. These aircraft could not have performed their role in the South Atlantic without these modifications.⁷⁸

Several other timely modifications were completed; however, for various reasons they did not see combat. AIM-9 missiles mounted on GR.3s and Nimrods were deployed but were too late to be needed or used in an air-to-air role.⁷⁹ The principle of flexibility in war was put into practice when the GR.3s reverted to their air-to-ground role after the threat changed. FINRAE had operational difficulties, and the GR.3's changing role meant that use of its INAS alignment was not as crucial as originally

envisioned. The Blue Eric EW pod was a technological breakthrough; however, it arrived too late to be tested in combat. If the war had continued or had taken a different course, these modifications and improvisations may have been used.

The C-130 tanker and the AEW Sea King helicopter modifications were far too extensive and complex to be completed before the hostilities ended. These major modifications would have taken years of work under peacetime conditions. In light of the British defense policy, these modifications would probably have never been undertaken if not for the Falklands war.

There are several reasons why these modifications were completed so quickly. The decisionmakers knew what needed to be done. The urgency of the situation called for immediate action rather than the contingency planning game of peacetime. In addition, there was little time to conduct extensive planning studies or to go through the normal approval or funding process. Of course, eliminating these steps probably presented risks to safety, but war made these risks acceptable.⁸⁰ Lastly, people have traditionally put forth a greater effort when their sense of national pride or security is challenged.

The British aerospace industry was challenged, and according to all accounts, it performed magnificently. Its contributions further support the argument for a country to maintain a strong indigenous defense industry that can respond when needed.⁸¹

War has always been a catalyst for industrial and engineering development. However, despite tremendous effort, many of the Falkland modifications were still not ready for operational use by 14 June. The lesson to be learned here is one of preparedness. There may not be time for the military or industry to provide the technological response to fill shortfalls.

It is clear that Britain went into the conflict with several major shortfalls. Had Argentina used better planning, employment, and execution, the course of events could have been different. The shortfalls

and the time it took to recover could have resulted in more severe losses or worse for the British.

Notes

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British aircraft modifications, as well as other wartime improvisations do validate an old cliché: necessity is the mother of invention. □

Ricochets*continued from page 3*

ities of military operations and the conceptual nature of strategic military theory. Perhaps the real obstacle to achieving this state in any satisfactory way is represented less by the security policy review "minefield" than it is by the need for military practitioners to increasingly channel a portion of our day-to-day energies into the intellectual pursuit of strategic literacy—no matter how busy it gets in the trenches.

Col Bennie J. Wilson III, USAF
North Chicago, Illinois

To Colonel Donovan regarding his paper "Strategic Literacy," I can only say "amen!" But it must be a qualified "amen."

For writers in the field, there are some pitfalls he fails to point out. Once one becomes known as a good writer, suddenly virtually anything that requires better-than-average writing seems to get dumped on one's desk. This is particularly true of award and decoration nominations, where the powers-that-be expect miracles from the writer. First, all too often the writer is expected to produce something from nothing, in order that the "fair-haired boy" can get undeserved recognition. Requests for facts to support the nomination fall on deaf ears, and the writer becomes an author of fiction. Second, the unit—failing to recognize the effort that is needed to produce really good writing—will wait until the last minute before delegating the task. I was once required to produce two Outstanding Airman of the Year nominations in the same afternoon! How many prospective writers, seeing the effects of this on their unfortunate colleague, hide their ability in order to avoid the same fate?

Another phenomenon often seen in the field (not usually in the staff) is the "mandatory creativity" syndrome. This is usually the result of some observation that base ABC has not published anything in command vanity publication XYZ lately, and that looks bad—especially since base CDE has had an article each and every month for the past year. The typical "solution" for base ABC is to establish a rotating suspense among its squadrons to produce an article each month. Quality is irrelevant; the only measure is quantity. The budding author takes to the hills when these suspenses come in the door. And how many of these periodicals are even read, much less taken seriously?

In contrast is the supervisor who will not let subordinates be any more intellectual than the boss. A case in point is the time I used a word my three-letter-word bosses had never seen. The assistant director said, "I had to look that word up—and learned something today." But the director said, "I don't know that word. Take it out." I also learned something that day—about my bosses! I have observed that these supervisors are also generally the ones who will not let their folks consider problems in the "hard" category. Bring in all the short-term pap you want, but show these people a really tough question that needs a long-term solution, and you will be thrown right out (or at least slow-rolled until you give up in disgust).

His proposal that we publicize the writings of our officers in their biographies and records could have merit, but not right away. In my experience, everything that senior people publish is in fact ghostwritten by the staff. We recognize this fact in formally establishing the job of speech writer for some very visible senior people. To give credit for authorship to the senior would result in failure to recognize the contribution of the real author, which is the very goal Colonel Donovan is after. If we do this, we also will have to forbid ghostwriting of published works, including speeches, since they are often published later as papers. I'm not going to hold my breath waiting for that! And recognizing the similarity of bureaucracies everywhere, I must ask whether Marshal Ogarkov writes his own stuff or has the staff do it. Bets, anyone?

Clearance is indeed a problem. For those who have not seen the process in action, some amplification on Colonel Donovan's thoughts are in order. The review is managed by the staff public affairs office, which farms the manuscript out to anyone it thinks might appropriately review the work. In Systems Command at least, this review is both for security concerns and technical accuracy. The author does not know who is performing the review, and the public affairs people will not release the names of the reviewers to the author. This is supposedly for complete honesty in the review, but can lead all too easily to abuse—especially in the area of technical accuracy. What constitutes "technical accuracy" in discussing a controversial development program? The obvious answer is that the manuscript will not be technically accurate until it reflects the party line.

While I doubt that our formal review process will be revamped to the extent proposed, there

are some things that can be done. Review of serious professional writings by the chain of command should be forbidden, for example. Normal staff writings can and should go up. But if we are serious about the disclaimers in front of our journals—that the thoughts within are the thoughts of the authors and not the Air Force—then why should the authors get their bosses' okay to publish? Staff reviews for clearance—not technical accuracy—can still be required, with careful safeguards to prevent censorship in the name of security. Let the journals protect themselves from technical quacks; most of them do technical reviews anyway before accepting a piece for publication.

Yet this will not help the problem of the supervisor who brands an author as a malcontent or radical after reading a paper with which he or she personally (or institutionally) disagrees. To that I have no answer, for it will remain a problem until there is a fundamental change in the way the Air Force views intellectualism and criticism.

Maj Julius F. Sanks, USAF
Edwards AFB, California

A DIFFERENT PATH TO SPACE

"Real Tenets of Military Space Doctrine" (*Airpower Journal*, Winter 1988) rightly characterizes space as a distinctly different realm of military operations from the air. The article (by Col Kenneth A. Myers and Lt Col John G. Tockston) demonstrates that basic US military space doctrine has not been brought up to date with "the way space capabilities are actually employed in space operations" today. However, the article begins a process that should be carried one step further. Basic doctrine, unless it is to be no more than a sterile description of how things are currently done, must take into account developing threats. By contrast, the article seems to rest upon the current state of affairs in its assessment of space capabilities and in its doctrinal recommendations.

It is vital to address the future in doctrine, particularly basic space doctrine, because "doctrine has, or should have, an extraordinary impact on the strategy process," according to Col Dennis M. Drew (cited by the article) and Dr Donald M. Snow in their book *Making Strategy*. According to the same authors in *Introduction to Strategy*, the primary operating realm of the strategist

must always be the future, since today's strategist is a captive of yesterday's research, development, and deployment decisions. And according to Maj Gen Perry M. Smith, Retired, in *Taking Charge*, it is the long-range, 10-to-25-year time frame that the strategist should be looking at.

One example of the article's orientation to the present is its identification of satellites as "inflexible" as compared to airplanes. While this is perfectly true at present, future systems have clear potential for more flexibility. For instance, developments in both more efficient conventional propulsion (e.g., the XLR-132) and electric propulsion will make the deployments of weapons to high orbits (e.g., 100,000 miles altitude) a relatively affordable, practical option. Once in a high orbit, a satellite would be far more flexible because for a relatively small amount of deboost, it could descend into an elliptical orbit, with its low point in low-orbit space. Such maneuvering would use gravity to tap potential energy, thus allowing force to be flexibly concentrated at the critical point (for example, to attack satellites in low-earth orbit that were interfering with US space launches). This employment of maneuver would effectively apply the doctrinal "gravity well" advantages foreseen by Dr Robert S. Richardson in 1943 (see *Confrontation in Space* by G. Harry Stine).

Another example of the article's near-term focus is its assumption that US space systems can employ "warning to operators to evade impending attacks." While warning may currently be useful to evade the first-generation Soviet anti-satellite (ASAT), it would be overly optimistic to assume this would be adequate in the 10-to-25-year time frame. It is well known that the Soviet Energiya rocket will be used in the future to deploy massive payloads. Are we to assume these deployments will not be weapons? The only sure identification short of wartime usage would come if they were tested openly in low orbit. However, *maskirovka* is more than just a Soviet slogan—its application means such weapons would be disguised and tested covertly (in high orbits, behind the moon, or in deep space). As more Soviet systems were deployed to low-orbit space, average proximity to US satellites would decrease, while technological progress increased their speed and effectiveness, thus decreasing warning. With the introduction of laser weapons or space mines, warning could approach zero. Given these potential circumstances, which are reasonable projections of

established trends, it would appear that warning and subsequent evasion should not be relied upon to the exclusion of other factors (such as protection of space-based weapons in high-altitude keep-out zones) to enable survivability and subsequent restorative space-control measures.

A third example of the article's current-operational approach is its identification of a robust launch capability as the means to sustain access to space. Since it is the primary conclusion of America's strategic defense initiative (SDI) research that launch vehicles are critically vulnerable in the boost phase, and since the Soviets have been working on SDI-type systems longer than we, it seems that boost-phase intercept would be the most likely means employed to threaten US access to space. Even a minimally capable Soviet SDI force could shut down US launches (or by attrition render them unaffordable). An escalatory US conventional or nuclear reaction to a blockade might be reasonably deterred by the threat of a Soviet response-in-kind (an option that gains practicability as more quiet Soviet submarines are armed with cruise missiles). Thus, a robust launch capability should be viewed as only one of the elements needed to ensure US space access. A survivable US force in space, for example, might be equally important in defending launch windows above US space-launch areas.

In short, while "Real Tenets of Military Space Doctrine" builds a strong case for major change in basic US military space doctrine based on present realities, the need for change is even greater when one considers the "futures" that can reasonably be anticipated. Perhaps the authors saw no need to strengthen their case by speculation about the future, which, despite obvious trends, is never fully predictable and therefore disputable. However, if doctrine fails to anticipate the future, the US will have no option other than to react after the fact. Such a situation abandons the initiative to potential adversaries—a condition we should surely wish to avoid.

Maj Thomas C. Blow II, USAF
Maxwell AFB, Alabama

THE SPETSNAZ THREAT

Regarding Capt Erin E. Campbell's article on "The Soviet Spetsnaz Threat to NATO" (Summer 1988): there seems to be a widespread misconception of the role and capabilities of Spetsnaz units. This misconception has even

permeated the US/NATO intelligence community, in spite of evidence to the contrary.

- Spetsnaz (troops of special designation) are by no means comparable to Western elite formations such as the special forces or the British Special Air Services (SAS). The bulk of these troops are two-year conscripts, "elite" in the sense that they meet the more stringent physical and mental selection criteria imposed for Soviet *desantniki*—airborne and air assault troops. We certainly ought to credit them with good combat skills, but beyond this we're straining credibility. It is ludicrous to believe (as many Westerners seem to) that these troops could move freely in the NATO rear, disguised as tourists or athletic teams, creating untraceable havoc.

- While Spetsnaz units are subordinate "in a special sense" (to use the Russian term) to the main intelligence directorate (GRU), there is nothing insidious in this connection. The GRU is responsible for reconnaissance and intelligence collection in support of military operations. Most Spetsnaz units are directly subordinate to fronts, armies, and fleets—which are, for the most part, not in the covert operations business.

- The primary mission of Spetsnaz troops is not unconventional warfare; it is operational reconnaissance directed against high-value targets, which will be attacked by means of long-range fire. Spetsnaz units undoubtedly have a secondary mission to carry out "diversionary" tasks in certain circumstances, but it is extremely unlikely that these valuable reconnaissance assets would be squandered on risky direct-action missions such as those cited by Captain Campbell.

- Finally, the history of warfare testifies to the fact that covert special-operations-type missions are extremely difficult to accomplish, dangerous to the participants, and rarely more than a minor irritant to the target country or armed forces. The most common result is the loss of highly trained personnel in exchange for trivial results. Intelligence analysts and military professionals unaware of this fact do not know their business.

A word of advice for Captain Campbell: citing Suvorov as a source does not enhance war credibility. Anyone who has heard Suvorov speak and is familiar with his background cannot fail to be struck by the lack of understanding he evidences with regard to the basic realities of warfare, and the brevity of his professional résumé in comparison with the knowledge he claims. He is a pure sensationalist, feeding an eager, gull-

ible audience in the West. We cannot blame him; he's a salesman like any other. If naive Westerners want an insidious Spetsnaz threat, he'll give us one.

Capt Ralph Hitchens, USAFR
Gaithersburg, Maryland

Captain Campbell Responds

The subject of Soviet Spetsnaz forces remains rather controversial today, largely because much of the information pertaining to this area is difficult to confirm and because there seems to be a lack of consensus in the West as to the exact nature and composition of these troops. Currently, there appear to be two schools of thought regarding the role of Spetsnaz troops. One school contends that Spetsnaz forces would be used almost exclusively for reconnaissance purposes in wartime; the other maintains that, in addition to this role, Spetsnaz troops also would be used for other missions such as sabotage and assassination. I adhere to the latter school, not only due to current indicators, cited in my article—of ongoing Spetsnaz preparations for a potential future war in Western Europe—but also due to precedents where the Soviets have used their Spetsnaz forces.

When the Soviets invaded Czechoslovakia in 1968, they initiated their actions with a surprise assault by their special forces, including both KGB and military Spetsnaz elements. While key objectives were being captured, local agents were activated—teaming up with KGB elements in securing political control throughout the country. Among these agents assisting the invading Soviet forces were members within the Czechoslovak Communist Party, many of whom had been trained in intelligence and diversionary work (i.e., sabotage and assassination) in KGB schools in the USSR. These agents were used for securing political control throughout the country while other agents acted to limit the possibility of coordinated and meaningful Czech military counteractions. The Soviet invasion of Czechoslovakia demonstrated the potential effectiveness of employing military active measures, performed by Spetsnaz and KGB troops that successfully used the element of surprise to enable the main army forces to perform their mission more readily.

Concerning events in Afghanistan, the insights of Vladimir Kuzichkin (a former KGB major who served under cover in Iran for five years) have been reported publicly, indicating that on

the evening of 26 December 1979, Soviet paratroopers struck at the telecommunications center, key government buildings, and the presidential residence in Kabul. The following day, after having landed at Kabul airport, an armored column moved out of the airport toward the palace. It consisted of a few hundred Soviet commandos, plus a specially trained assault group of KGB officers. They were all in Afghan uniforms, and their vehicles had Afghan markings. When they reached the palace, the special troops attacked with orders from Moscow that Amin was to be exterminated, that no prisoners were to be taken, and that no Afghans were to be left to tell the tale of what had transpired in the palace. The Spetsnaz forces apparently were successful on all counts.

It is indeed highly unlikely that NATO would find "a Spetsnaz behind every tree" or that the Soviets have a large contingent of troops that could blend into Western Europe posing as natives of the region. Nevertheless, the events in Czechoslovakia and, more recently, in Afghanistan indicate that the Soviets would use their Spetsnaz troops for unconventional war purposes, and this possibility is a factor that NATO should take into account when assessing the threat posed by the Soviets during wartime. Finally, while Captain Hitchens finds "nothing insidious" in the Spetsnaz connection to the GRU, he seems to ignore the Spetsnaz forces under the control of the KGB, which would likely be used for purposes other than reconnaissance.

Capt Erin E. Campbell, USAF
Alexandria, Virginia

RUNWAY REQUIREMENTS

Reference your article, "Operational Art and Aircraft Runway Requirements" (Fall 1988). I share Colonel Bingham's concern about the influence of the air base on the air commander's operational art. I value his historical perspective on the issue. I want to add technical perspective to his argument. As a test pilot at Edwards AFB, California, I developed methods to measure the damaged runway operating capability of aircraft in the US Air Force inventory. From Edwards I moved to the Naval Air Test Center where I flight-tested the Harrier—the old AV-8A and the newer AV-8B. I also tested Air Force mobile arresting gear. At the Air Force Flight Dynamics Laboratory, I was the program manager for the F-15 short takeoff and landing (STOL)/maneuvering technology demonstrator. I was later chief

of the laboratory's Flight Control Division. I shall comment on three general areas: "conventional" airplanes, vertical and/or short takeoff and landing (VSTOL) aircraft, and the role of the airfield.

First, current fighters, especially with arresting gear, can operate from rapidly repaired runways. That capability should be improved. The STOL F-15 has landing gear that increases rough runway capability by 75 percent and can be easily retrofitted. Other minor upgrades could further improve the existing fleet's operability from combat bases.

Other conventional airplane problems Colonel Bingham cites are being addressed. The F-15 STOL demonstrator will stop better than previous fighters with thrust reversing. It uses control technology to overcome problems with instability, so stopping distances can be comparable to takeoff distances. Colonel Bingham properly makes an issue of finding the touchdown point. Even a Harrier needs someone on the ground to help choose a place to land. The F-15 STOL's system will guide the pilot to the designated spot. Incidentally, its landing speed (about 120 knots) is limited by visibility over the nose rather than the usual sloppy, slow-speed handling. Landing accurately is a task modern control systems can handle well, without hard touchdowns. Better flight controls, landing gear, and reverse thrust can reduce runway length, width, and smoothness requirements.

Current airplanes use arresting gear to reduce landing distance. Colonel Bingham mentions the time required to reset the gear. Just as relevant, arresting gear operators work in a vulnerable wartime environment. Robotic arresting gear should be developed. Improved runway repair techniques can also be developed. The synergism of increased ability to operate from damaged runways and improved repair techniques has great potential. The base must become part of a fighting system, not just a place to park.

A better understanding of the air base and its relationship to the airplane is essential. We should study the Navy's systems engineering approach to aircraft carriers and carrier-based aircraft. We can also study existing fortress bases in Sweden and Switzerland. We seldom build new bases, but we can modify our current European and Pacific bases to become part of a system with the airplanes.

United Kingdom (UK) Harriers use dispersed basing. With mobile support equipment, they disperse to previously scouted locations. De-

tachments are self-contained with substantial cross-training of personnel. They rely on deception, mobility, and dispersion to avoid attack. The aircraft are designed for dispersed operations. Electrical power for maintenance is supplied from the auxiliary power unit (APU). A built-in hydraulic hand pump facilitates maintenance. Simple, nonredundant, accessible mechanical and electronic systems are reliable and maintainable. Design of the base affects design of the aircraft and vice versa.

Where does VSTOL fit? Several dozen VSTOL experiments in the United States, UK, France, West Germany, and the USSR have so far contributed only the Harrier and the Forger. The technical compromises required for a successful design dictate a limited set of requirements. I am confident that the compromises of VSTOL will be resolved as engine thrust to weight improves. Today, the ratio of engine thrust to weight is between seven and 10. Within the technically predictable future, it will rise to about 20. With that single improvement, most of the current impediments to VSTOL operation will be removed.

Should the Air Force be buying AV-8Bs today? Perhaps. The Harrier II has about the same payload/range as the F-16. It bombs extremely well and can give a good accounting of itself in self-defense. It cannot match the F-16 in air-to-air, but it can fly even if the runways have been attacked. It has different logistics support requirements than current US Air Force airplanes and requires a special training program. It does have fuel reserve requirements, and tired pilots still have a critical landing task. The pilot cannot land in any parking lot or open field. With real bullets loaded for air-to-air, I'd much rather be in an F-16 than an AV-8. If plenum chamber burning is perfected, the fuel consumption of the AV-8 would be excessive in the 400-to-700-knot arena. But it could be the only forward-based US Air Force airplane flying on the day the war starts.

Should the Air Force be at least gaining experience with Harrier operations? Absolutely. My assignment with the research, development, test and evaluation (RDT&E) program and several exchange pilots' assignments have not given the US Air Force enough collective experience to think about the impact of tomorrow's or even today's VSTOL technology.

How can we best approach our uncertain future? We must face up to wartime requirements as well as ease and economy of peacetime operations. Air base operability must be considered

in the design of airplanes. Thrust reversers are heavy and expensive but may be necessary. Bases must be improved. If we fully recognize the costs of facing up to today's necessities, VSTOL becomes a more attractive option. On the other hand, we must recognize our substantial investment in "rubber on the ramp" and find innovative ways to keep our current fleet combat capable as we develop tomorrow's Air Force.

Col Richard A. Borowski, USAF
Holloman AFB, New Mexico

MAYDAY! RESPONSE

The Fall 1988 editorial entitled "Mayday! Mayday! Mayday!" has done a good job of putting the cart before the proverbial horse. The beast is the same one we have drug to the water bucket many times. The typical US Air Force officer today would have a hard time professionally and completely answering the question "Do you really want to commit forces and fight?" Somehow we have taken quantum leaps and pushed the cart of political-military thought out in front and now have to drag the war-horse of operational art from behind. Where is the problem? Let's look at the Pentagon, which has grown in direct proportion to the size of the congressional staffs and subcommittees. The puzzle palace contains only a token force of operationally (vice tactically) smart people. Why? Because that is where our "best and brightest" gravitate in search of future command positions and increases in rank—not out to the theater commands. Yet, the lack of understanding of the operational level of warfighting, no matter how astute the political-military knowledge, relegates the horse to the rear position. The *Airpower Journal* is designed to correct this and make the level of knowledge of both political-military thought and operational level of warfare a complete package.

You can only professionally answer the question "Do you really want to commit forces and fight?" by gleaning all the available information and knowledge from our system. This system not only includes the dilemmas of the political-military situation but also must include the knowledge and education at the operational level of warfighting one can gain by being assigned to a unified or specified employment staff or by reading about it. The *Airpower Journal* is doing the latter to make our future warfighters smarter.

Col M. R. Taffet, USAF
Maxwell AFB, Alabama

I have watched, with great interest, the discussion over the proper focus of the *Airpower Journal* (Editorial, Fall 1988). This issue would appear to be the latest example of the much larger discussion concerning the proper development of the military professional: are we professional specialists (pilots, civil engineers, accountants, and so on) who happen to work for the United States Air Force, or are we professional soldiers with training in various specialties?

If we are indeed professional soldiers first, then we must ensure that our brethren in arms are trained as soldiers as well as specialists. I do not believe "Mayday" advocates that the *Journal* should be focused on senior officers; rather, "the appropriateness and methods of translating political objectives into reality through military action" should be of concern to all officers. In recent testimony before the House Armed Services Committee, Gen John T. Chain, Jr., commander in chief, Strategic Air Command, said, "I believe it is important for an officer to understand the politico-military context in which our military forces train and operate."

So, the question as it relates to the *Airpower Journal* would seem to be as follows: is the *Journal* to be focused on the professional soldier, or is it to be focused on the professional aviator? In Colonel Geiger's position update, the assertion was made that the "professional journal of the United States Air Force" should "concentrate on how best to apply [military power]." Professor Samuel Huntington, in his *The Soldier and the State*, in defining a professional soldier, rules out most enlisted people because they apply, rather than manage, violence. The application of air power is important, but it is only the final step in a long, involved process that professional soldiers must understand if they are to be able to properly bring that air power to bear.

It is my firm belief that soldiers concerned only with "operational art" are, at best, satisfactory technicians. These soldiers, since they know nothing of the interplay of their "art" and the politico-economic realities of society, cannot be expected to be responsible for any ramifications of their actions beyond the simple fact of whether the target was hit or the hill was taken. Are these professionals? I think not!

In the final analysis, professional soldiers serve because they believe in their country and place their country's good above their own. They are the protectors of their country. The citizenry at large may take world affairs for granted, but it

is imperative that professional soldiers be intimately familiar with all aspects of their country and its place in the world. To expect any less is to invite disaster.

Capt William H. Eckert, Jr., USAF

I appreciate your broadcast invitation to join in the debate on the proper focus of my favorite Air Force publication. I find, on balance, that I favor the approach advocated by Colonels Fabyanic and Baucom for a reason that they don't cite specifically.

At the behavioral level, we each progress during our service through various stages from operator to (we hope!) senior leadership positions. We ought to be developing a broader and broader perspective of our profession during that whole process so that, whatever our current positions, we have the ability to relate our current responsibilities to what the overworked phrase calls the "big picture." The services have always enjoyed a well-deserved reputation for "growing" their officers in ways that are the envy of my civilian counterparts in the field of human resources development. I would hate to take too big a step back from that tradition just when others, in the private sector, are awakening more and more to its advantages.

Professional military education (PME) is an invaluable assist in the growth process, but it is necessarily episodic in its application. Professional growth requires continuous learning. Your excellent magazine is, indeed, our professional journal and, therefore, our primary tool for this continuous learning process. I would not consider a "big picture" focus appropriate only for the senior leader; every officer should be evolving into that level of understanding on a continuous basis. I would advocate this position even if we did not serve a democracy; the reality of our being citizen-soldiers makes it all the more imperative that we have the resources of professional growth and understanding.

The reorientation of the *Journal* was by no means negative; perhaps the previous version had drifted into issues that were a bit too far from the "sharp end." But with air power, as with any other subject, intelligent professionals can best understand how to use their tools if they understand why they're using them.

Maj William C. Bennett, USAF
Randolph AFB, Texas

Concerning the guest editorial by Colonels Fabyanic and Baucom, I find myself agreeing with

their position on the focus of the *Airpower Journal*. I quote from "the inside cover of that Fall 1988 issue: "designed to serve as an open forum for presenting and stimulating innovative thinking on military doctrine, strategy, tactics, force structure, readiness, and other national defense matters." The reader can expect an air power slant to all of these subjects. However, there is no mention of the perceived company/junior field-grade officer's concern with "effectively orchestrating military action to achieve the objectives set by the strategists and higher-level campaign architects."

Further, I feel belittled by the suggestion that only senior officers (O-6 and above) are concerned "with the appropriateness and methods of translating political objectives into reality through military action," as indicated in your refrain. While this may be part of the responsibilities of their particular positions, certainly others amongst us are concerned with the appropriate application of force in executing national security policy.

Colonels Fabyanic and Baucom, Col Dennis Drew, and Lt Col Price Bingham did not suddenly achieve an understanding of national security policy upon reaching the ranks of the senior field grade. They studied long and hard to understand the likes of Carl von Clausewitz and Antoine Jomini and, I trust, began this study while still company grade officers. We must remember that the officers at the Air Corps Tactical School in the 1930s included the likes of Capt Claire Chennault, Capt George C. Kenney, Capt Hoyt S. Vandenberg, and Maj Carl Spaatz—men who did not wait until they had achieved field grade to think great thoughts.

Personally, I had hoped to have an article or two published in time, first in the *Air University Review* and later in the *Airpower Journal*. This is the "professional journal" of the Air Force—the forum in which one would expect to find articles on national security with an air power slant. I read the likes of *International Security and Foreign Policy* to further my knowledge, yet the role of the Air Force is, for the most part, not a subject.

While operational experience is very beneficial in this realm and depth of knowledge in one's Air Force specialty code (AFSC) furthers one's professional performance, AFR 36-1, *Officer Classification*, does not include an AFSC for "strategic thinker." From whence are they supposed to emerge? We must cultivate these interests from the beginning, or not only may we

expect the scenario provided by Colonels Fa-
byanic and Baucom, but also the individual pro-
viding the commander in chief with the answer
to a question on the use of military force may
never have served a day in uniform and thus lack
operational experience of any nature. And once
again we may leave the making of strategy in the
hands of civilians as we have done with nuclear
strategy (such as Bernard Brodie, Herbert York,
Herman Kahn, and Thomas Schelling).

Capt William B. Vlcek, USAF
Thompson, Connecticut

TO FLY AND FIGHT

I was glad to see Col Wayne Possehl's article "To Fly and Fight at the Operational Level" in the Winter 1988 issue of the *Airpower Journal*. An understanding of the operational level of war will be fundamental to our effectiveness in any future combat. With apologies, I do believe Colonel Possehl was too quick to dismiss those rarest and most unconventional of situations wherein the wing commander would have to operate at the operational level of war. Granted, the level of the allied tactical air force (ATAF) and allied tactical operations center (ATOC) is where we normally find the operational level of war.

However, within NATO's Allied Command Europe there are a dozen ATOCs, regional operations centers (ROCs), tactical air forces (TAFs), and equivalent-level air organizations on the offensive side, plus at least eight defensive-oriented sector operations centers (SOCs), not counting United Kingdom (UK) Air and a couple of specialized organizations. In the event of war, it is highly likely that one or more of these organizations will be out for some period of time. Then responsibility will fall to the wing or base commander, as that person is often known within NATO. Often, for US Air Force squadrons, that wing commander will not be an American.

The more we understand the operational level of war, the better prepared we will be to integrate our air power into the battle and to be effective. Colonel Possehl's article is a good first step, but we need to think and talk more about this most critical area. One question to ask ourselves is, "Who is manning the ATOCs, ROCs, TAFs, and SOCs, which will be providing our air task orders?" A supplemental question is, "Do the assigned staff officers understand how to get the most out of assigned US Air Force squadrons?" More articles are needed on this critical issue.

Col C. R. Krieger, USAF
Washington, D.C.

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net assessment

Chennault: Giving Wings to the Tiger by Martha Byrd. Tuscaloosa, Alabama 35487: University of Alabama Press, 1987, 480 pages, \$25.95 hardback.

Martha Byrd has given us an excellent biography of Claire Chennault. Best known for his role in leading the Flying Tigers against Japan during World War II, Chennault is depicted here as gruff, stubborn, and iconoclastic but also as gentle and cultured. It is an interesting portrait.

Byrd shows that Chennault's personality was both his greatest strength and his greatest weakness. He displayed a determination and courage that won many advocates, but his stubbornness and tendency to gloat in victory gained him even more enemies. When he was a junior officer, these same traits kept him in frequent difficulty with his superiors. Fortunately, his outstanding abilities as a pilot and leader saved him from oblivion.

Chennault arrived at the Air Corps Tactical School in 1930 with a reputation as a premier pursuit pilot. His ideas concerning pursuit employment evolved from much thought and practical experience. But Air Corps doctrine was making a decisive shift in favor of bombardment, and Chennault's attempts to stem this tide were futile. As Byrd points out, Chennault's abrasive personality negated his well-conceived arguments, and his colleagues found it more satisfying simply to ignore him. Suffering from a variety of physical ailments and realizing his theories were out of tune with Air Corps policy, Captain Chennault retired in 1937.

His story might have ended there and his name forgotten had not an unusual opportunity then presented itself. The Chinese, engaged in an undeclared war with Japan since 1931 and needing an American adviser to build their air force, offered Chennault the position. Byrd states that Chennault saw this opportunity as an "escape from a sense of failure and inadequacy" and accepted.

For the next 20 years, Chennault's life intertwined with China. He served as an adviser to Chiang Kai-shek and his wife, "Madame," and after Pearl Harbor was recalled to active duty and soon advanced to the rank of major general. Fol-

lowing the war, Chennault became a private businessman and formed a commercial airline in China. These were immensely difficult times, and Byrd is masterful at describing the obstacles thrown up by the Japanese, the Americans, and by the Chinese themselves. (Indeed, in a typical contradiction, Chennault railed incessantly at the mistakes and shortcomings of his American superiors, but he showed infinite patience with the corruption and Byzantine intrigue of the Chinese.) As before, Chennault's performance featured a dogged determination that won the loyalty of his subordinates but also an abrasiveness that alienated virtually everyone else. He had an especially difficult time with his American superiors.

Never on good terms with his Air Corps colleagues, Chennault exacerbated this relationship with his constant complaints and his tendency to circumvent the chain of command by dealing directly with Chiang and President Roosevelt. Although knowing how this infuriated his superiors, Chennault persisted. As a consequence, George Marshall thought him disloyal and unreliable, "Hap" Arnold considered him a "crackpot," and Joe Stilwell called him a "jackass." Chennault wanted to fight the war *his way*, without interference. Even if his strategic theories had been correct, his method of promoting them ensured their demise.

In fact, his ideas were not sound. It is one of the book's few flaws that it does not sufficiently explore the implications of Chennault's "air guerrilla" strategy. He believed that a small force of aircraft, mostly pursuit aircraft, could so disrupt Japanese logistics as to lead to its eventual defeat. In 1942 Chennault proposed to President Roosevelt that a force of 105 pursuit planes plus 30 medium bombers and 12 heavy bombers could knock Japan out of the war. This boast was patently absurd, but Byrd defends it by claiming a typographical error: Chennault really wanted 150 pursuit planes!

The image of Japan being destroyed by a dozen B-17s would be amusing had Chennault not been serious. What the general advocated was an intensive interdiction campaign against Japanese supply lines. But interdiction campaigns do not win wars, and it is doubtful if any amount of tac-

tical air power could have prevented Japan from overrunning China, much less brought about its defeat. Though an outstanding tactician whose determination in the face of overwhelming supply and equipment difficulties kept the Fourteenth Air Force in the field, Chennault's strategic ideas can only be classified as puerile.

With the war's end, Chennault remained an outsider to the Army Air Force hierarchy. Retiring once again, he maintained his ties with China and set up its Civil Air Transport. Like Douglas MacArthur, his many years away from home had distorted his global vision; he saw only Asia. Also like MacArthur, he was a "cold warrior," and he fought Mao's Communists, with help from the CIA, as vigorously as he had the Japanese. This time Chennault was defeated. Pushed off the mainland and suffering severe financial losses, Chennault returned to America nearly two decades after he had left. Retiring to a cabin in Louisiana with his new Chinese wife and children, he thundered at his many enemies both in and out of government service. He died in 1958, defiant to the end.

Byrd admirably describes Chennault's complex and contradictory personality. He could be tough and gentle, concerned and callous, a good husband and father, and a notorious rake. Byrd is commendably balanced in her treatment and shows her subject both as a hero and a sinner. Her research is thorough, especially for the period through World War II. Her treatment of Chennault's postwar activities and his CIA connections are not handled as well. For these events Byrd relies primarily on Chennault's papers, interviews, and secondary sources. CIA documents, most of which are now declassified and available for review, were not consulted. Nevertheless, this is an excellent book, undoubtedly the definitive biography of an important and controversial American airman and his relationship with the Chinese enigma.

Lt Col Phillip S. Meilinger, USAF
USAF Academy, Colorado

A Pattern for Joint Operations: World War II Close Air Support, North Africa by Daniel R. Mortensen. Washington, D.C. 20402: Office of Air Force History and US Army Center for Military History, 1987, 94 pages, \$5.50.

Close air support has been and continues to be an extremely controversial subject. Many people

in and out of the Army see close air support as the critical test of whether they can depend on the Air Force. To help eliminate many of the misconceptions and myths surrounding close air support, we now have an excellent study produced as a cooperative effort between the US Army Center of Military History and the Office of Air Force History. Motivation for the study came from the memorandum of understanding between the Army and Air Force chiefs of staff concluded on 22 May 1984 and, in particular, initiative 24, which reaffirmed the Air Force's mission to provide close air support to the Army.

As explained in the preface, this study focuses on the North African campaign because this was where the basic system of close air support for American forces was worked out. Yet, there are two other important reasons why this campaign deserves study. The campaign shows the problems military forces face when they make the transition from peace to war. In addition, it is one of the few cases where US forces have fought for air superiority while simultaneously conducting major ground operations.

Relying on both primary and secondary sources, this well-documented study begins with an examination of the organization, doctrine, and weapons developed for close air support during the interwar years. Before the war, ground officers dominated the Army, causing doctrine to reflect the view that air power was primarily an auxiliary force to further the ground-force mission. While some concessions were made to the ideas of airmen, especially as their influence increased in the years just before the war, the irresolvable nature of the issues resulted in doctrine that tended to equivocate about close air support. Attempts to test doctrine and promote teamwork were handicapped by self-serving attitudes from both the air and ground branches, as well as by the limited availability of aircraft for large-scale exercises. Equipment was still another problem. The war in Europe showed that the type of aircraft the Air Corps possessed was excessively vulnerable, causing Gen Henry H. Arnold to procure light bombers to perform close air support.

Problems quickly became apparent once the North African campaign commenced. Unlike their commander, Gen Dwight D. Eisenhower, many subordinate ground commanders did not think of air power in theater terms. Ignoring standard doctrine and even his planning guidance, they were adamant about parceling air power out to provide air cover over their forces

to defend against German air attacks. Their inefficient use of air power was made worse by a slow request system, breakdowns in logistics, and the fact that Allied aircraft were based a greater distance from the front than German aircraft. While Eisenhower and his air adviser, Maj Gen Carl Spaatz, worked to correct these problems, the debacle at Kasserine brought matters to a head.

Taking over the Allied Air Support Command during the battle, British Air Vice Marshal Sir Arthur Coningham convinced Eisenhower to let him use scarce aircraft assets for employment in close air support. Drawing on a reputation earned by success in the Western Desert, Coningham instituted important changes that gave air leaders greater control. He abandoned defensive air umbrellas in favor of offensive operations designed to seize air superiority. He also removed light bombers from air support units, assigning this duty to fighter-bomber units. Besides supporting these actions, Eisenhower authorized a committee to produce a new doctrine—Field Manual 100-20—that stressed the need for air superiority and established close air support as the third priority after air interdiction. Generally satisfied with these changes, Eisenhower remained concerned, despite his victory, because many field commanders still did not understand his thinking.

Dr Mortensen has written an important book. Both airmen and soldiers should read it to appreciate the problems commanders can cause when they are ignorant of doctrine and its rationale. My only criticism is that the study takes such a broad perspective that close air support receives too little treatment from a tactical perspective.

Lt Col Price T. Bingham, USAF
Maxwell AFB, Alabama

GI: The American Soldier in World War II by Lee Kennett. New York 10022: Charles Scribner's Sons, 1987, 265 pages, \$20.95.

For pure fascination, *GI: The American Soldier in World War II* is hard to beat. Its 265 pages are a splendid mix of fact, anecdote, observation, and analysis. Portraying the transition from civilian to soldier, University of Georgia history professor Lee Kennett surveys the "view from the barracks," movement overseas, combat/wounds/death/capture, and finally the GI as liberator and conqueror. Professor Kennett con-

cludes with a nostalgic look at what it all meant to participants through the eyes of veterans 40 years later at a division reunion.

No aspect of this work is as thorough as the Army's official histories. But for a quick look at a little bit of everything, *GI* is ideal. Trivia lovers will adore the beguiling train of anecdote and detail. For example, instant coffee as a modern national staple was developed for K rations by the Army Quartermaster Corps. The leading cause of nonbattle casualties in World War II was traffic accidents, with 12,000 GIs killed and 230,000 injured. By 1945, the largest American retail operation was the Army's Post Exchange (PX) system. The reader may be surprised to learn of Army Chief of Staff George C. Marshall's personal concern over Frank Sinatra's draft exemption for a hearing defect; that the Military Police Corps dates only from 1941; that to reduce fire hazard, few camp or fort buildings were over two stories high; that the greatest training innovation of the era was the training film, with over 400 produced (several by future commander in chief, then Signal Corps captain, Ronald Reagan).

Despite large blocks of regulars, national guardsmen, and reservists, World War II was truly the war of the draftee. And Americans had never experienced conscription in peacetime. Thus, the first peacetime draftees frequently received community or local club sendoffs, complete with cigarettes and a dollar bill (almost 5 percent of a private's pay in 1940) or a bag of Bull Durham and a Bible.

GI opens with the Army's peacetime expansion. Attempts to apply lessons learned in and from World War I are intriguing, especially concern for winnowing out individuals who might be susceptible to "shell shock." This World War I problem had affected nearly 100,000 Americans by 1919, and their care had cost the Veterans Administration almost \$1 billion. Accordingly, by 1945, the Army had rejected 1,846,000 men for neuropsychosis. As is so often the case, more revealing than mere numbers are some of the accompanying vignettes. The psychiatrists' brief interviews were by no means foolproof, and one harried analyst reported "interviewing" 512 men in one day.

Much of Kennett's recounting of the transition from civilian to soldier is timelessly familiar. Nevertheless, it is unlikely any of today's recruits would put on a uniform 22 years old and find a 1918 PX receipt in the pocket, as did some of the first draftees in 1940. That year was also

not a time of great affluence in America. The depression was far from an ancient memory, and one US home in three did not have running water or central heating. The Army offered both. For many soldiers, uniformed life was an economic step up. Barracks life, however, with its "endless scrutiny" and unending uniformity, was another matter.

The expanding Army underwent enormous growing pains. There were shortages of everything. By 1941, an Army-wide morale crisis set in. For tens of thousands of citizen-soldiers, adjustment to Army life was aggravated by asking themselves "Why?" A special secret report likened the draftees' concern to a "football team in training but without a schedule of games."

Overseas, the American GI was immediately recognized almost everywhere. He was usually accompanied by fleets of the quintessential American vehicles of the day—the jeep and the two-and-one-half-ton truck. The GI seemed never out of or far from vast supplies of cigarettes, gum, and candy. Scenes of American soldiers surrounded by children were seldom contrived. The GI's very distinctive headgear—the M1 helmet and liner now being phased out—was a resounding success and a trove of fascination. Early helmet liners were first made from impregnated fiber, later from redwood bark, and then from macerated canvas before the ultimate answer: laminated phenolic resin-impregnated fabric.

Once the GI was at war, he sought special symbols of belonging—a division shoulder patch, paratrooper boots, "tanker" jackets, and the Combat Infantry Badge. And he took special pride in his "by-soldiers, for-soldiers" alter egos—the Sad Sack and Bill Mauldin's Willie and Joe.

Kennett devotes considerable attention to the two major theaters of war, pointing out such dramatic differences as the Pacific GI's higher neuropsychiatric rate and lower venereal disease and AWOL rates than his European theater counterpart. These and other differences—including the relatively high degree of hatred for the Japanese but low degree of hatred for the Germans—were the results of vast differences in Pacific and European theater climate, geography, culture, and—for venereal disease and AWOL—opportunity. Particularly unfamiliar to the Pacific GI was an environment with so few towns, cities, and farms.

All in all, little is missing. Kennett covers mail censorship, rumors, GI "war brides" (80,000

from England; 12,000 from Australia), the troopship experience ("We'll win this damn war but I can't face the trip back"). Even the lowly C-ration can receive its due. (Enemy recon planes could sometimes spot routes and bivouacs by following the trails of golden C-ration cans—until they were painted olive drab.)

Kennett describes the essential quality of the American GI overseas as "enthusiasm." No tribute to nor explanation for this characteristic is more revealing than a Czech villager's remark about the Americans' less than precise way of marching: "They walk like free men."

GI: The American Soldier in World War II closes with the author's visit to the 1985 reunion of the 84th "Railsplitters" Infantry Division. It is a moving, wistful look at what it all meant—the transition from civilian to soldier, soldier to veteran, liberator, conqueror, and back to civilian again—to the men who experienced it over 40 years before.

This book is lively, entertaining, and informative. It is by no means the only or the last word on the subject, but in 265 pages it is very likely the best.

Lt Col Wayne A. Silkett, USA
SHAPE, Belgium

Foreign Intelligence Organizations by Jeffrey T. Richelson. Cambridge, Massachusetts 02138: Ballinger Publishing Co., 1988, 311 pages, \$39.95.

Any attempt at writing about the secret worlds of national intelligence and security organizations is a noteworthy endeavor. American author and consultant Jeffrey Richelson has done just that and succeeded admirably. His *Foreign Intelligence Organizations* completes a trilogy—started more than four years ago—examining every major intelligence community in the world. The previous two volumes—both well received—were *The U.S. Intelligence Community* (1985) and *Sword and Shield: The Soviet Intelligence and Security Apparatus* (1986).

Promoted as the "only book of its kind," *Foreign Intelligence Organizations* provides detailed descriptions of the intelligence communities of eight nations—the United Kingdom, Canada, Italy, West Germany, France, Israel, Japan, and China. While not inclusive, this list still represents a significant grouping of national intelligence assets—separate from the United States and the Soviet Union—involved in the se-

rious and complex business of intelligence collection and analysis.

On the positive side, Richelson is very consistent in presenting a framework to discuss intelligence organizations. Each chapter deals with a separate country. The first section on origins traces how each one evolved to its modern arrangement. The author then goes into varying degrees of detail, examining intelligence and security organizations, management structures, and liaison with other national organizations to include "work with—or against—our own [American] intelligence-gathering strategies." Examples of recent actual intelligence missions follow. Concluding every chapter are citations for documentation and reference.

Foreign Intelligence Organizations is a welcome addition to the small but growing field of unclassified literature dealing with classified intelligence agencies. For readers interested in the world of intelligence, this book compiles a great deal of useful information. When combined with Richelson's earlier efforts, it presents "a more complete picture of world-wide intelligence gathering."

Of value are the sections on the origins and evolutions of several of the national intelligence organizations. Particularly interesting is the section on how—beginning in 1946—the United States helped Richard Gehlen, World War II German military intelligence leader, establish an intelligence program to penetrate Eastern Europe and the Soviet Union. Gehlen's effort produced the first postwar foreign intelligence organization in West Germany.

Additionally, Richelson does a credible job discussing how the eight countries direct their intelligence resources in internal and external operations. Of special interest are sections depicting how these countries collect, collate, and use intelligence on terrorists, both inside and outside their national boundaries.

On the negative side, Richelson uses extensive secondary source materials. Granted, dealing with classified subjects—on foreign organizations—in an unclassified publication is difficult to do. Yet, the author seems at times to take the easy way out by referencing secondary sources instead of analyzing and breaking out information contained in available primary sources. Additionally, some information is too dated to make the points originally intended. For example, Richelson discusses in considerable detail how Britain shares finished intelligence analysis products with the other Anglo-Saxon nations,

has extensive liaison arrangements, and participates in joint conferences. As proof, he lists four such exchanges and conferences the British had—in 1974! Surely, more recent examples are available; unfortunately, they are not used here.

An imbalance in presentation also creates some problems because of the amount of space—or lack thereof—devoted to actual intelligence missions performed recently by each country. In the chapter on the United Kingdom, discussion on intelligence operations in the Falklands War goes on for 13 pages. Richelson devotes half of that—seven pages—to US-Israeli intelligence operations in the chapter on Israel. Examples for the other countries average only slightly more than two pages each on operational matters.

One way Richelson could have avoided this problem would have been to write two books instead of one to complete his study of the world's intelligence communities. This reviewer would have liked Richelson first to take some of the information provided in his *The Ties that Bind: Intelligence Cooperation with the UKUSA Countries* (United Kingdom, United States, Canada, Australia, and New Zealand)—coauthored in 1985 with Australian Desmond Ball—and expand it into a study on Commonwealth intelligence organizations. That way, he could add parts on Australian and New Zealand intelligence and security organizations to an elaborated coverage of British and Canadian efforts and their connection with the US intelligence community. Richelson could then write the second book on the other intelligence organizations of the world. These might include those of the Warsaw Pact countries, South Africa, Middle East, and so on. Enough secondary source materials should exist to support such an approach.

These problems aside, *Foreign Intelligence Organizations* serves as a thorough and valuable survey of several of the world's principal intelligence organizations. For readers who want to know something about such agencies and how they relate to the extensive intelligence arrangements of the Americans and the Soviets, Jeffrey Richelson's three-volume set is very useful.

Lt Col Frank P. Donnini, USAF
Maxwell AFB, Alabama

Fighting to a Finish: The Politics of War Termination in the United States and Japan, 1945
by Leon V. Sigal. Ithaca, New York 14850: Cornell University Press, 1988, 335 pages, \$39.95.

As the title of this work implies, the closing events of World War II in the Pacific serve as the vehicle for the author's analysis of factors affecting political and military decisions necessary to war termination. Lest the reader be misled, let me hasten to add that the book is not primarily about the United States' use of nuclear weapons against Japan although that decision is among those reviewed in support of the author's thesis.

Clearly, the political decisionmakers in both the United States and Japan had to consider the international situation. The interests of allies, friends, enemies, and potential enemies obviously impinged on the process of war termination. The general approach to studies of war termination has been to assess the national interests of the warring states in the international context and to seek an explanation of their decisions in a cost-benefit analysis of the options available to them. In this rational-choice approach, individual states are regarded as unitary actors, able to calculate to some degree the relative costs and benefits to be derived from various options and to select the most cost-effective in terms of their national interest. But according to Dr Sigal, this technique of analysis, although useful, fails to adequately explain decisions made with regard to war termination.

For example, Dr Sigal rejects the rational-choice explanation that the decision to use nuclear weapons against Hiroshima and Nagasaki was based simply on the calculation that other methods of forcing Japan to surrender would involve even greater casualties, both American and Japanese. Similarly, he refutes the revisionist view that the use of nuclear weapons against Japan was driven primarily by an external, political objective—the desire to demonstrate to the Soviets the destructive power of the weapon and the American will to use it. Both of these propositions derive from rational-choice analysis but differ in imputing a different assessment of the national interest to the political decisionmaker. According to Dr Sigal, both also suffer numerous anomalies that the rational-choice method cannot explain.

Dr Sigal, however, maintains that most of these anomalies are explainable by the use of a different method of analysis. His central contention is that "the approaches of internal politics and organizational process help clear up many of the anomalies in rational-choice accounts of the end of the war between the United States and Japan." For example, he argues that the American refusal to provide assurances regarding the

fate of the Japanese emperor despite agreement by US officials that preservation of the throne would be in the national interest can be explained as a result of internal politics. He maintains that the doctrine of "unconditional surrender" had become such an article of faith with the American public that no politician could risk being pictured as condoning a retreat from that doctrine, regardless of rationality. The influence of organizational process is depicted in the discussion of Secretary of War Henry L. Stimson's largely unsuccessful attempts to limit the conventional bombing of Japan, an effort that foundered on the Air Force's determination to demonstrate the efficacy of strategic bombardment and prove that air power alone could be decisive. Dr Sigal's analysis is not, of course, limited to these examples, which are cited here only as illustrations of the tenor of his work. He does not reject the rational-choice approach as valueless but does an excellent job of pointing out its limitations and suggesting other tools that can help supply a more complete understanding of the war-termination process.

The final chapter in this book is devoted to examining the implications that the author's contentions may have for today's nuclear-armed nations. Dr Sigal attaches a caveat to this discussion by recognizing the limitations of his single example and acknowledging that there are important fundamental differences in today's situation. He is conservative in his claims concerning the predictive value of his methods of analysis but argues convincingly that war termination in the nuclear age is fraught with difficulty. He concludes that these difficulties suggest strongly that the best time to stop a nuclear war is before it begins.

This addition to the distinguished series of Cornell Studies in Security Affairs should prove useful to scholars seeking to understand the dynamics of the oft-neglected area of war termination. Its utility is enhanced by thorough documentation (a bibliography of approximately 200 entries, many of them to primary sources), skillful footnoting, a useful index, and a lucid, readable style. This latter attribute should ensure that the book is also read and appreciated by decisionmakers who can profit from the author's analysis of factors that affect the process of war termination.

Lt Col Harvey J. Crawford, USAF
Maxwell AFB, Alabama

Fletcher's Gang: A B-17 Crew in Europe, 1944-45 by Eugene Fletcher. Seattle 50096: University of Washington Press, 1988, 267 pages, \$19.95.

In 1944-45, the emotions of B-17 crewmembers stationed in Europe generally alternated between protracted boredom and intense fear. More than merely explaining this phenomenon, *Fletcher's Gang* illustrates the variations in the daily routine of the air combatant who fought in "the Good War." "This narrative is not intended to be a saga of the Battle of the Air during World War II," writes Fletcher—a former pilot and bomber commander—"Many authors have already documented the thrilling air battles and the heroism and danger inherent therein. It is a study of the mood of the times, and what went on in the minds of the people who were caught up in this crucial struggle." Thus, there is something about the psychology of the warrior to be gleaned from reading this collection of 1st Lt Eugene Fletcher's wartime letters to his wife, interspersed among diary entries of crewmembers and Fletcher's own recollections and explications made 40 years later.

What the author calls "a study" is really a collection of narrative accounts of the stateside training and the 35 combat missions flown by Fletcher and his crew as part of the 95th Bombardment Group (Heavy), 13th Combat Wing, 3d Air Division, Eighth Air Force in Europe. Fletcher's letters to his wife constitute the core of the book, but he presents each mission from as many reliable viewpoints as he is able to muster. Each account generally begins with an entry from the diaries of the copilot, navigator, or bombardier, followed by Fletcher's letter to his wife concerning the mission, and concludes with the author's recollections and commentary.

Both Fletcher's book and crew have numerous virtues. The book has an air of authenticity. The crew emerges as skillful, united, and dutiful but real human beings. They are sometimes frightened, sometimes cocky, sometimes unseemly or impolitic, but generally brave and successful. The first-person, firsthand account of each mission makes the book more credible than one written solely from library research. Although the author has biases, emerging both in his letters and his commentary, they appear to have changed sufficiently over 40 years to offset each other somewhat. This fact, together with the technique of recounting each incident from different perspectives, gives the reader a fairly objective picture.

Overall, the book presents Fletcher as a good flyer and a responsible soldier. On more than one occasion, the different accounts verify that the 22-year-old first lieutenant's skills as a pilot resulted in the safe return of a damaged or even crippled ship. And Fletcher's integrity is apparent from his letters home. For instance, acknowledging that letters from the front were subject to wartime censors but that many soldiers attempted to send home accounts of combat missions anyway, Fletcher makes it clear from the beginning that he feels duty-bound not to say any more than is appropriate: "I could refer to my work more closely than I do and it would probably get by. But I look at it this way, why take a chance? The rules were made for my safety and the least I can do is try to live up to them." On another occasion, when the crew goes off to play, he feels committed to stay and study the responsibilities of his command.

The crewmembers agree that he is a good officer. Fletcher "was admired and trusted by each of us," recalls the navigator. "We knew he was loyal and would fight to protect our interests. The longer I live and the more people I observe, the more certain I become that Fletch was an exceptional leader; he is an extraordinary man!" He is dutiful but not at the expense of enterprise and humor. The retelling of occasions when he stretched the rules or played practical jokes breathes life into both the man and the book.

Another element that lends the book authenticity is the depiction of fear experienced by crewmembers during missions. Though sometimes rightfully terrified at the risks a particular mission might entail, the crew plods on—in every instance successfully returning with a fully intact crew, if not a fully intact plane. After the first combat mission, Fletcher's ground crew counted 23 holes in his ship caused by flak—not the most that he would eventually bring home, but evidence of baptism under fire just the same.

There is enough authentic duty, honor, and "shoot 'em up" in *Fletcher's Gang* to make interesting reading for any Air Force member (despite the author's disclaimer that the book is not a war saga). The book also documents another important side of war and its effects on the mind: the long, boring hours—and sometimes days—that pass between combat missions. However, there are elements of humanity in these accounts of boredom that make them interesting. According to Fletcher, these were times when a shortage of reading materials had every soldier reading everything he could find, from pulp detective

fiction to poetry. A commercial radio was a rare possession and a sheer delight, despite its fuzzy reception of German stations only—when it received anything at all.

The book is realistic and insightful. At times it is also humorous and exciting. *Fletcher's Gang* is readable, interesting, even sometimes compelling. But there are some minor problems: transition between the accounts from different sources and daily entries is not always smooth, occasionally leaving the reader feeling that he is being jerked around. And at least once, there is a distracting shift in the narrative personal pronoun.

Despite these minor stylistic problems, however, the book is generally meritorious, artistically as well as historically. The juxtaposition of the varying accounts of each incident gives the reader a deeper feeling for the stresses of World War II combat and, even more, for those long periods of monotony between missions. The book is high-quality, personal history, refreshingly unencumbered by the jargon and prejudices of academic historians. All in all, *Fletcher's Gang* is a good book for personal history buffs, for those interested in the nonhistorian's account of the war—especially the role of the Army Air Corps—and simply for readers curious about the authentic struggles of the human spirit during wartime.

Capt David M. Kirkham, USAF
Washington, D.C.

Reforming Defense: The State of American Civil-Military Relations by David C. Hendrickson. Baltimore, Maryland 21211: Johns Hopkins University Press, 1988. 152 pages, \$24.50.

"Of defense reform," writes David Hendrickson, "it might fairly be said that while there is a consensus that we need it, there is no agreement on what it is." In an attempt to ease the confusion surrounding military reform, Hendrickson defines and analyzes the three major reform movements that have arisen in the 1980s: military, organizational, and administrative.

According to Hendrickson, the "military reformers" submit the following propositions: (1) American military services continue to support a doctrine emphasizing attrition and should realign their strategy toward "maneuver warfare," (2) weapons procured by the services do not work in combat and are expensive to maintain,

(3) tactics used are outdated, and (4) personnel policies reflect individual service needs rather than the strategic needs.

"Organizational reformers" emphasize the need for change within the military establishment. The basic critique of the organizational reformers holds that serious problems in the organization of the military services have led to a military establishment in which the parochial interests of each service have been forwarded to the detriment of the national interests. "Administrative reforms" center on the vast administrative bureaucracy that supports the military establishment. Some of the proposals call for greater competition in the procurement of military equipment, the elimination of duplication among the services, independent testing bureaus within the Pentagon, and the elimination of the "revolving door" whereby military officers retire to lucrative positions with defense contractors they ostensibly supervise.

In the first part of his book, Hendrickson places these reform movements within a historical context that stresses traditional, theoretical, and practical dilemmas raised by civil-military relations. Specifically, Hendrickson examines three problems. First is the division of responsibility between the civilian and military leadership. Second is the lack of unified direction, resulting from the division of civilian authority between the executive and legislative branches of the government and the division of expertise among the independent military services. The third area concerns three organizational dilemmas resulting from the sheer size of the branches of service: (1) the question of whether the military services should be structured along mission or functional lines, (2) the appropriate degree of centralization (or decentralization), and (3) the responsiveness to change. In reviewing the three problems, Hendrickson attempts to outline a more proper "division of labor" among the civilian and military institutions competing for authority and power to determine military policy.

Hendrickson then goes on in part 2 of his books to show how the many reform proposals—particularly those of the military reformers—are misconceived and might serve to undermine the effectiveness of the military. Hendrickson reviews seven propositions that he considers central to the notion of military reform. His discussions range across such topics as the use of the large-deck aircraft carrier as the center of the naval battle group, the Air Force's "self-image as an 'independent arm' capable of achieving

an independent decision in battle," the direction NATO has taken in the past decade under American leadership, and the preference of the services for the most advanced "high-tech" weaponry that budget constraints make impossible to procure in the necessary quantities. Hendrickson then goes on to the question of institutional reform. He draws particular attention to three areas. First is a reform of the budgetary procedures that would stabilize the acquisition of weapon systems. Second is a reorganization of the Department of Defense that would give greater authority to offices—based on their mission—and less to offices that support the missions. Finally, he discusses a revision to the 1948 Key West Accord, which would correct (according to the critics) deformities in force posture.

In his conclusion, Hendrickson places the military reform critique in a final and surprising perspective. When the subject is considered in total, Hendrickson feels it is difficult to escape the conclusion that a civilian attempt to impose a reform program on the services would result in very serious consequences and would make things worse, not better. The real case for reform, Hendrickson argues, lies in the transformation of American strategic doctrine, in those institutional changes that would combat the lack of unified direction in civil-military relations, and in the strengthening of military professionalism within the American officer corps.

Hendrickson does an excellent job of discussing all aspects of the various issues confronting the defense establishment. I highly recommend adding this book to your professional library as a concise but comprehensive review of the major issues of the defense reform movement.

Capt Robert L. Eskridge, USAF
Malmstrom AFB, Montana

While Others Build by Angelo Codevilla. New York 10022: Free Press, 1988. 256 pages, \$22.50.

This analysis of the politics of the strategic defense initiative (SDI) by a Hoover Institute fellow (former 10-year member of the Senate Intelligence Committee staff) comprises a unique view of the US space-weapons research program. Its overview of ballistic missile defense (BMD) pro-

vides advocates of SDI much useful technical information and many quotable turns of phrase. However, even detractors of SDI will be fascinated by author Angelo Codevilla's view of the Washington power struggle he believes has dominated SDI.

Codevilla describes various assumptions made in researching BMD—both by critics and SDI program officials—that he believes are "presumptuous to the point of being self-deceptive." He outlines in some detail why he believes that this "policy reasoning dressed in pseudo-technical cloaks" has only tenuous connections with reality. This analysis—combined with Codevilla's personal, behind-the-scenes experiences—will raise questions in the reader's mind. Reflecting upon these questions will help the reader develop a much deeper understanding of the role of SDI.

Codevilla constructs a case for the proposition that the SDI program has functioned primarily as a "research-ever, deploy-never" political dynamic, rather than as a precursor to a fully realized interdictory defense. Certainly, this conclusion is a cynical one. On the other hand, the objective reader must credit this notion with some degree of truth, and the curious reader must wonder what the degree might be.

Some of Codevilla's assessments remain at the level of assertion because they outline the intentions of individuals, which can never be nailed down. For example, he describes the actions of the president as "resolute indecision" that failed to challenge bureaucratic inertia for the funding of existing initiatives. He outlines how various factions of the governmental bureaucracy have reacted and compares the logic of their reactions to institutional incentives.

Codevilla believes that recently proposed legislation establishing a US defense force needs to be passed. According to him, this legislation is necessary to set firm goals and assign adequate authority to US space-weapon program initiatives. The safest, wisest course is for the United States to build the best defense it can with the tools at hand, rather than continue to mark time while others build. He argues that the Soviet-directed energy warfare program "is in the process of turning out not just technology, but primarily weapons. No American knows what these weapons will or won't do. . . . The Soviet Union is really ten years ahead of the US in anti-missile weapons."

After assessing Codevilla's case, some readers may find that they still disagree with his conclu-

sions. However, I believe serious students of SDI should add this book to their list of required reading.

Maj Thomas C. Blow II, USAF
Maxwell AFB, Alabama

The Tuskegee Airmen: The Men Who Changed a Nation by Charles E. Francis. Boston 02147: Branden Publishing Co., 1988. 300 pages, \$16.95.

The *Tuskegee Airmen* is the comprehensive history of America's black military aviators during World War II. In those days, Army Air Forces units formed a mushrooming giant within the US Army, which was required by law to operate racially segregated units. Consequently, nearly 1,000 black pilots and six times that number of black enlisted airmen were trained at Dr Booker T. Washington's famed Tuskegee Institute to operate their own segregated legion within the Army Air Forces.

How good were these men as combat aviators? They won 150 Distinguished Flying Crosses; 160 of them, mostly officers, were killed in air operations; and they shot down 136 enemy aircraft, mostly German, destroying 273 more on the ground.

From their ranks came Lt Gen Benjamin O. Davis, Jr., (35th of 276 in West Point's class of 1936), later US under secretary of transportation; Gen Daniel "Chappie" James, the nation's first black four-star officer; and a generation of black high achievers, both in and out of aviation. Their immediate legacy was the 21 black jet combat pilots and hundreds of black airmen who fought with the fledgling and racially integrated US Air Force in the Korean Conflict. Today, the 5.4 percent of the Air Force officer corps who are black and the 15.3 percent of black enlisted airmen would scarcely recognize the strange mixture of early air power euphoria and plain old Jim Crow that was the World War II life of the Tuskegee airman.

The presence of any black airmen at all in the US forces during World War II was due to patient lobbying by the National Association for the Advancement of Colored People. Sen Harry H. Schwartz of Wyoming and Congressman Louis Ludlow of Indiana sponsored bills in the Senate and House "to guarantee the training of Negro military aviators." Surprisingly, America had several hundred "licensed Negro civilian pilots" in 1941. Secretary of War Harry W. Woodring se-

lected the Tuskegee Institute in Alabama for the training site. If offered free land, existing facilities, a supportive environment, and an Army Reserve Officer Training Corps headed by (then) 1st Lt Ben O. Davis, Jr., whose father was America's first flag-rank black officer.

The initial graduates formed the 99th Pursuit Squadron, flying P-51s over North Africa, Italy, and German-occupied eastern Europe. This unit was later subordinated to the enlarged but all-black 332d Fighter Group, which was decorated with the Distinguished Unit Citation—the unit Medal of Honor equivalent.

Should World War II America have trained its fledgling black airmen at a Northern site? Might integration of the armed services have been hastened by that decision? By law, the Army and Navy of 1941 to 1945 were totally segregated. Because the Army Air Forces itself was a component of a major service, one hardly could imagine a solitary legion within a subordinate force being able to integrate the far-flung millions who were activated for World War II.

The secret to the Tuskegee airmen was a quality that reflects the mighty spirit of the late Dr Booker T. Washington. One black pilot who was shot down and captured by the Germans was being taunted about his role as a second-class citizen in his homeland. This Tuskegee airman asked his captor why the Germans were so hard on the Jews and their weaker European neighbors. Confined to a 16' x 16' room with nine other cellmates—seven from the segregated Southern states—he reported, "Although I was a Negro they treated me as one of them. Each man performed a duty, and each day we combined our rations, cooked it together, and shared equally."

Too soon, America has forgotten these air heroes who were the transition to a US Air Force where a man or woman advances on merit. At the US Air Force Academy, a statue of the "Tuskegee Airmen" has been dedicated during moving ceremonies. Author Charles E. Francis, who was one of them, tells their story with accuracy, candor, and a conspicuous absence of recrimination. Any reader—military or civilian, air-minded or earthbound—will feel very good about America at the end of *The Tuskegee Airmen*.

Dr Russell W. Ramsey
Maxwell AFB, Alabama

Wars of the Third Kind: Conflict in Underdeveloped Countries by Edward E. Rice. Berkeley, California 94720: University of California Press, 1988, 186 pages, \$18.95.

Wars of the Third Kind is must reading for every military officer. Rice, a foreign service officer with vast experience, has packed into this small book a superior synthesis of the best available materials on revolutionary warfare, including the unique insights of his personal experiences as a virtual eyewitness to "wars of the third kind" in several diplomatic posts. For those Americans who equate revolutionary warfare only with the recent American past and present (i.e., Vietnam and Nicaragua), Rice draws on previous American experiences (the Philippines after the Spanish-American War and Nicaragua during the 1920s and 1930s) as well as similar wars in Algeria, China, Cuba, the Philippines after World War II, Mexico, and—of course—Vietnam and modern Nicaragua. His analysis of revolutionary warfare offers marvelous insights bolstered by wide-ranging historical evidence. Of particular interest is a fascinating chapter on the perils that await great powers who find themselves enmeshed in "wars of the third kind." This chapter should be required reading for every American policymaker (and Soviet policymaker in the wake of Afghanistan). If the book has a fault, it is that there needs to be more "prescription" to accompany the "description." But then, no one seems to have yet formulated the consistently effective counter to a well-led and popularly based insurgency. In sum, *Wars of the Third Kind* is a superior book—one of the very best on a very important subject.

Col Dennis M. Drew, USAF
Maxwell AFB, Alabama

The Doolittle Raid: America's Daring First Strike against Japan by Carroll V. Glines. New York 10003: Crown Publishers, Inc., 1988, 272 pages, \$17.95.

One of the difficult challenges facing an author writing about a famous wartime mission such as the Doolittle raid is creating an atmosphere of excitement and drama that will pull the reader through to the end of the book. After all, the basic

scenario of the raid (16 bombers taking off from an aircraft carrier to conduct the first air strike against Japan, dropping bombs over widely scattered targets, and crashing in China) has been known to readers since Ted Lawson's classic *Thirty Seconds over Tokyo*. In a masterful piece of writing, however, Carroll Glines answers the challenge with a gripping, riveting chronicle of the famous raid. In addition to blending numerous recollections from participants and dozens of previously unknown aspects of the mission, he fleshes out the epic with fascinating accounts of what happened to the crews after the raid.

After years of research, Glines amassed amazing details about the operation. For example, we learn how the idea for the raid originated: Admiral King, the chief of naval operations, suggested transporting Army bombers and cargo planes on an aircraft carrier to North Africa to help counter possible French resistance in an impending invasion. A submarine officer on his staff took that idea and developed the strategy that put 16 B-25 bombers on the carrier *Hornet* off the Japanese coast.

Glines also gives a full account of the preparations for the raid. With incredible speed (just over three months elapsed from the birth of the idea to the dropping of the bombs), Doolittle assembled the planes and crews for secret training in Florida. The B-25s received unusual modifications: broomstick "guns" were put in the undefended tail to deceive attacking fighters, the bottom gun turret was replaced with a gas tank, and a new low-altitude bombsight was made from 20 cents' worth of aluminum and installed in just weeks. Even so, a blimp still ferried parts to the planes after the *Hornet* left San Francisco.

Surprisingly, we find that the aircrews were quite relaxed before the raid. Their detailed recollections show that they were mainly concerned about the condition of the planes and their ability to get off the carrier deck—not about the flight over Japan or the landings in China.

Glines presents a dramatic, plane-by-plane account of the fate of all 16 bombers. In addition to the adventures of the more famous crews (Doolittle's and Lawson's), the daring experiences of the other crews come to life. Each crew picked its own target. We learn that their attacks on Tokyo were actually witnessed by several Americans on the ground, including the American ambassador. Glines re-creates the exhilaration of attacking enemy targets and the desperation of crews faced with low fuel, bad weather, and unfamiliar enemy territory.

After the attack, many of the crewmembers faced bizarre situations. One aircrew landed in Russia and was confined in rapidly deteriorating facilities. After working as aircraft mechanics, they finally escaped over the Soviet-Iranian border 13 months after the raid. One crewmember from another plane bailed out over China and, after regaining consciousness, found he had landed on top of a cliff. Two crews were captured by the Japanese. Although Glines wrote a separate book, *Four Came Home*, on the fate of these crews, he includes several poignant chapters covering their experiences in captivity and their rescue. Three crewmembers were executed after a mock trial. Their farewell letters are both courageous and heartbreaking. The account of the rescue of other captured crewmembers at the end of the war proceeds at fever pitch. Despite surrendering, the Japanese had no intention of releasing the fliers from prison in occupied China. Only the brilliant exploits of an Office of Strategic Services (OSS) agent who parachuted into Peking saved their lives. Even after their release, however, incredible experiences continued. One raider was hospitalized under terrible conditions in several US military institutions and, in effect, was rescued again—this time by General Doolittle.

Several sections of the book create so much excitement that the reader can't turn the pages fast enough. The author includes much factual information yet weaves it into a story that is better than most wartime fiction. Glines, an honorary Tokyo raider, begins and ends his book by describing the raiders' annual reunion. His book is a magnificent telling of the famous raid that will inspire Americans long after the last raider is gone.

Capt Stephen J. Gardetto, USAF
Andrews AFB, Maryland

Going Downtown: The War against Hanoi and Washington by Jack Broughton. New York 10003: Orion Books, 1988, 300 pages, \$18.95.

Nineteen years ago, Col Jack Broughton wrote his first book, *Thud Ridge*, a graphic depiction of the air war in Vietnam as seen by Air Force pilots of the F-105, also known as the "Thud." Thud drivers flew predominantly against targets in "Pack Six"—the northernmost area of the coun-

try, often around Hanoi/Haiphong. This area contained formidable defensive weapons, including SA-2 surface-to-air missiles (SAMs), MiG-15, -17, -19, and -21 aircraft, and antiaircraft artillery (AAA) up to 100 mm. Colonel Broughton, whose career as a fighter pilot included combat in Korea, a tour as the Thunderbird lead, and experience as vice wing commander at Takhli AB, Thailand, has not simply described the air combat of the Vietnam War in his new book, *Going Downtown*. Not only does he put the reader in the cockpit and the war, but also he characterizes the frustrations of those men who risked and lost their lives in a war that was being micromanaged from Washington on down the chain of command. The incident that caused his career to come to a sour close also prompts an important statement on loyalty as a two-way street in our Air Force.

Early chapters in *Going Downtown* describe the political history of Vietnam and Ho Chi Minh, the air war in Korea, and development of the Century Series fighters, including the F-105. Colonel Broughton then takes the reader on an eye-opening tour of air combat in Vietnam with the F-105, including struggling to avoid radar-guided antiaircraft fire, last-minute maneuvering to avoid SAMs, coping with some of the worst weather in the world, and losing friends in combat.

The theme of the book deals with the extent to which politically motivated restrictions caused unnecessary loss of life, extended the war and POW internment, and led to the eventual loss of the war. Broughton presents a strong case that the supposed attacks on US destroyers *Maddox* and *Turner Joy* in the Gulf of Tonkin in 1964 were fabricated by the Johnson administration to justify our retaliation to earlier unanswered attacks by North Vietnam. This fabrication occurred after election-year outcries by Sen Barry Goldwater. Colonel Broughton describes President Johnson as being a "step behind" throughout the war but reserves most of his criticism for Secretary of Defense Robert S. McNamara.

McNamara was convinced that there was no possibility of winning the war and feared China's entering the war on the side of North Vietnam. McNamara's self-fulfilling prophecy colored his warfighting philosophy throughout his time as secretary of defense. Target lists were maintained for approval by the president, and final target approvals occurred at a weekly luncheon although no military representatives were present. Colonel Broughton describes the case of

an F-105 pilot who was recalled just as he taxied out. McNamara had telephoned him directly, wanting him to change his target and ordnance—a striking example of the bureaucratic micro-management of the war. The Johnson/McNamara team stated from the start that not even an out-house would be attacked unless they gave their approval. Colonel Broughton cites numerous examples of unnecessary restrictions at the fighting level that were instituted by President Johnson on down the chain of command—restrictions usually made by people who were separated from the fighting and unfamiliar with the war. The irony was that no one listened to ideas from the Thud pilots at the wing level—the very people who were fighting the war.

Colonel Broughton concludes *Going Downtown* with a chilling account of the "Turkestan incident," involving the unintentional strafing of a Soviet ship in harbor by two of his pilots. The ship was just inside a forbidden target area and was apparently unloading ammunition to anti-aircraft guns that were firing on F-105s. Broughton and the two pilots wrongly attempted to conceal the attack from higher authorities, but Broughton explains his actions by putting the reader in the frustrating position of those people who were fighting the war. In the subsequent court-martial, Colonel Broughton made a strong statement about loyalty in the Air Force. He felt that he concealed the attack out of loyalty to his pilots, but when he needed support from his superiors during the court-martial and during the war, no one came to his aid.

Going Downtown is a frank and vivid account of the air war in Vietnam. It also cites some lessons learned from the war in an attempt to prevent us from repeating our mistakes in the future.

Capt Todd Travis, USAF
Vance AFB, Oklahoma

The Gulf War by Edgar O'Ballance. London: Brassey's Defence Publishers, 1988, 231 pages, \$28.00.

Edgar O'Ballance, a specialist in international terrorism, is a frequent contributor to military literature. His work is characteristically contemporary and concise. Both of these features are prominent in his latest book, *The Gulf War*. His efforts result in what ultimately must be consid-

ered an uneven but needed addition to our understanding of the gulf war between Iran and Iraq.

The Gulf War is a relatively straightforward account of the causes of the conflict, followed by a chronological history that focuses on military campaigns through 1987. The author effectively outlines the early twentieth-century history of both nations, illustrating how perceptions and prior international agreements prepared each for the conflict that ensued. O'Ballance's explanations are exceptionally clear, sometimes reading more like a cookbook than a history book. Given the Byzantine complexity of Southwest Asian international affairs, this characteristic is more of a blessing than a curse. Only the portion of the introduction concerning the effect of the rule of the mullahs on Iranian military readiness deprives the reader of needed information. The author generally describes a deterioration in readiness, but a bit more detail would have gone a long way toward explaining the initial successes of the Iraqi army.

O'Ballance follows up the introduction with a blow-by-blow review of each military campaign. This section is valuable because it provides the military reader with a great deal of interesting information concerning strategy, operational planning, and tactics. In a number of cases, however, O'Ballance is sloppy in his technical details. Although the flaws are not fatal, they detract from the credibility of the book. For instance, the author confuses the Phoenix air-to-air missiles of the Iranian F-14s with heat seekers and cannot understand why they were not employed against Iraqi tanks. I had to read that section several times. Similar errors were found in his account of the Israeli attack on an Iraqi reactor. It is a pity that these mistakes mar a generally well-written work.

While not destined for leather binding or status as a timeless classic, *The Gulf War* is an admirable overview of that subject. O'Ballance has succeeded in giving us most of the essentials of the long, bloody conflict and conveys them with crisp, concise journalistic prose. I would most highly recommend this book as a companion to other works that focus more clearly on the political and social underpinnings of the war. *The Gulf War* is not perfect, but it does take the reader where few books have yet ventured.

Maj Bill Nikides, USAF
Langley AFB, Virginia

Pleiku: The Dawn of Helicopter Warfare in Vietnam by J. D. Coleman. New York 10010: St. Martin's Press, 1988, 315 pages, \$19.95.

It is hard to imagine the US Army in Vietnam without helicopters and air mobility for combat operations. But the war in Vietnam did not create the need for helicopter warfare—it validated the need. J. D. Coleman traces more than a decade of developments that led to the central highlands west of Pleiku, where for 35 days in 1965 a new 1st Cavalry Division (airmobile) corroborated the concept of air mobility. America's first division-sized commitment to the Vietnam War tested men, equipment, and doctrine in combat to determine if infantrymen could be freed from the "tyranny of terrain."

In a well-researched, factual manner, Coleman recounts the struggle within the Army and Department of Defense to achieve tactical mobility with large-scale helicopter movements. The development of high-powered, lightweight turbine engines provided Army visionaries with the technology needed for a tremendous increase in tactical mobility. The Air Force was clearly hostile to the new concept of air mobility and insisted on a series of agreements that limited the size and armament of Army aviation assets. The author covers the formation and testing of the new airmobile division along with the preparations for deployment following President Johnson's increased commitment to Vietnam.

The book focuses on events of 1965 that were intimately familiar to the author. One should not assume, however, that *Pleiku* is a reminiscence of J. D. Coleman, retired lieutenant colonel. In addition to his own experience as an information officer with the division, Coleman relies on personal interviews, official records, and captured documents to write a gripping history of uncertain and dangerous events. He hits his stride as an author of combat history, re-creating the action coincidental with the 1st Cavalry Division's arrival in the central highlands of Vietnam.

By detailing the daily movements and contacts of the combat units of the 1st Air Cavalry, Coleman shows the complexity and rapid pace of battle management in Vietnam. The poor quality of US military intelligence in this campaign became a key factor as the division deployed throughout an area where division-strength North Vietnamese regular forces were preparing to sever South Vietnam. Because helicopters moved companies and battalions with bewildering speed, however, the tactical mobility of the

division's combat units overcame the faulty information concerning enemy size and location. Artillery was airlifted in daily to support the intense fighting in and around landing zones and camps. Air-interdiction missions augmented supporting artillery. Permanent sites for the 1st Air Cavalry troops became inviting targets for the North Vietnamese, leading to the idea that real estate was worthless. The enemy had to be chased, engaged, and defeated. Scout helicopters searched for the North Vietnamese by drawing fire with "recon-by-decoy" tactics. Helicopter gunships suppressed enemy fire while troop-laden Hueys delivered soldiers to the fight. And J. D. Coleman documents every battle with precision.

In short, the American forces compensated for inadequate intelligence reports with mobility, punished the North Vietnamese with artillery and air interdiction, and influenced battles by delivering additional troops by helicopter. These tactics all point to a reliance on technology and numbers, similar to the situation described in Russell Weigley's *The American Way of War*. But Coleman takes pains to accurately describe the bloody and valiant fights by the men of the 1st Air Cavalry Division. The opposition was determined, the landing zones were often tiny, help was late in coming, and the outcome was often in doubt.

The author had the opportunity to clearly contrast the success of the helicopter airlift operations with the disastrous march of a single cavalry battalion to landing zone (LZ) Albany. He chose instead to let his readers draw their own conclusions. The American commander had his battalion in an unusual single-column formation that prevented it from either attacking or defending itself. The march ended when the battalion was ambushed by a battalion-sized enemy force. After suffering extremely heavy losses, the American forces remained while the North Vietnamese withdrew. The author seemed less than objective in his analysis of the operation: "It had been a hip shoot and the NVA lost—at least in the sense that they were gone and the Americans were still on Albany." But the battle at LZ Albany cost 151 American lives. Perhaps the author is unwilling to blame the fiasco on comrades who served honorably but not perfectly.

Soldiers of the 1st Air Cavalry Division defeated a North Vietnamese division that subsequently withdrew into Cambodia. This defeat forced the Hanoi leadership to reevaluate their

plans for South Vietnam. Although 304 troops of the 1st Air Cavalry were killed and an additional 524 wounded in the 35-day Pleiku campaign, the losses most certainly would have been greater without helicopter warfare and air mobility. This book is an important addition to the history of military aviation and adds to the understanding of the Vietnam War.

Maj Rick Searle, USAF
Falcon AFS, Colorado

The Spit-Shine Syndrome: Organizational Irrationality in the American Field Army by Christopher Bassford. Westport, Connecticut 06881: Greenwood Press, 1988. 171 pages, \$38.00.

The Spit-Shine Syndrome is military reformist criticism with a difference: it is highly personal, passionate, and—the seriousness of the subject matter notwithstanding—humorous. Christopher Bassford, who served for six years as an artillery officer in Korea and West Germany and is now a doctoral candidate in history at Purdue University, joined the Army as a research project. He must have kept detailed notes and clearly observed an extremely large number of cases of military incompetence. With this material, he accuses the Army—and the other services as well, given the similarities of their bureaucratic organization—of being incapable of accomplishing wartime missions.

Bassford ardently believes that the Army's first priority should be its ability to fight. *The Spit-Shine Syndrome's* thesis is that the Army's excessive focus on appearances rather than on the realities of military effectiveness is so ingrained that it cannot be rectified short of radically reforming the entire system.

National spirit, codes of ethics, general staff, excessive fat, the draft, procurement, bureaucratic infighting, and interservice rivalry are not central to the Army's inability to fight effectively. Rather, the problem is that the Army is structured on a bureaucratic model that is incompatible with the military mission. Bassford focuses on personnel turbulence caused by individual, rather than unit, assignment. This type of assignment inevitably results in unit combat ineffectiveness because most military skills are collective skills. Unit training, cohesion, and continuity are essential for combat effectiveness. Consequently, individual assignment may be a

rational approach in a bureaucratically driven system, but it is not the rational approach in a combat-oriented system.

Bassford believes that meaningful reform must be based on unit (combat) performance. Short of actual war, this ability to execute would be determined by an elaborate, large-scale "external evaluation." These evaluations, which could last up to three weeks, would replicate combat as much as possible. They would provide reliable data on the combat effectiveness of units, individuals, equipment, the supply system, and so on. Unit performance in these evaluations would allow revision of the promotion, assignment, pay grade, supply, and command and control systems. Bassford maintains that if the careers of everyone in the line Army depended on unit performance in the "external evaluations," combat capabilities would improve dramatically. Bassford is not particularly critical of people in the Army; in fact, he states that they have adapted to the existing system, its priorities, and incentives. They give the Army what it currently demands. Behavior can be changed only by changing the reward system. To get combat effectiveness, Bassford maintains that the Army should demand professional military competence through systemic changes.

Reorientation of Army priorities would be reflected in a wide range of personnel matters. Senior noncommissioned officers who have military experience and have demonstrated leadership with fighting forces should be given the appropriate (liberal and military) education and, after commissioning, should comprise a significant portion of the junior officer ranks. Field commanders should control promotions, assignments, and school selection. Rank and pay grade should be divorced. Commanders and troops should be freed of bureaucratic interference so they can concentrate on large-scale, combined-arms training.

The excellent bibliographical essay notwithstanding, too much of *The Spit-Shine Syndrome's* documentation—especially of Army incompetence—is from the author's personal observation. However, because the armed forces are less than candid in official documents, more authoritative or more broadly based sources are extremely rare. His observations, criticism, and suggested solutions are essentially centered on the field Army—on combat and combat support—at battalion level and below, which was the extent of Bassford's experience. This assessment, unfortunately, slights operational art and

implies that military effectiveness is based solely on tactical effectiveness.

In general, a democracy requires a crisis to force reform of an institution that has lost its ability to accomplish the missions for which it exists. The armed forces have largely been unwilling to accept responsibility for military failures in Korea, Southeast Asia, Iran, Lebanon, Grenada, Libya, and the Persian Gulf. How critical must military failures be before they are widely recognized as institutional failures and before the nation demands reform? In identifying a problem of this magnitude—the Army's failure to focus on its combat capabilities—*The Spit-Shine Syndrome* is not part of the problem; it is part of the solution, and probably for all the armed services—not just for the Army.

Lt Col Jeffrey C. Benton, USAF
Maxwell AFB, Alabama

Air Power and the Ground War in Vietnam:

Ideas and Actions by Donald J. Mrozek. Air University Press, Washington, D.C. 20402: US Government Printing Office, 1988. 212 pages, \$9.00.

The use of air power in support of or in lieu of ground combat operations constitutes a subject of great contention amongst theorists and historians alike. It seems inevitable that the role of air power during the Vietnam conflict will be a subject of concern and controversy, if not always wisdom and erudition, for years to come.

All too many considerations of the air war in Southeast Asia have been unsatisfying, whether they were based upon dated documentation as was Guenter Lewy's *America in Vietnam*, overly freighted with political-science modeling as with James Thompson's *Rolling Thunder: Understanding Policy and Program Failure*, or enthusiastically tainted with the demonology of presumed American hubris as in James Gibson's *The Perfect War: Technowar in Vietnam*. Now, Professor Mrozek, with a book short in length but detailed in documentation and rich in scholarship and insight, provides the baseline for the history of air power in Vietnam.

The author has undertaken the formidable task of considering the roots of US Air Force doctrine, matters of conflicting interbranch and interservice institutional imperatives, and unclear or changing political and diplomatic considerations. That he has produced a coherent explication and interpretation rather than a mere

pastiche is due to the simple fact that he never strays from the basics: his is a military history in the framework of political history.

In the early 1960s, Air Force doctrine was rooted in the experience of World War II—during which time the conflicting imperatives of strategic bombardment and support of ground forces in combat were never resolved—and was conditioned by the overarching mission of the 1950s: the deterrence of nuclear war. This doctrine and the force structure evolved to implement it were challenged by the Kennedy administration's view of the emerging threat of Soviet-inspired insurgencies. The imprecise and romanticized New Frontier concept of "counter-insurgency" stimulated a debate within the Air Force concerning its competencies within this putatively new environment. Mrozek, through the extensive and able use of lengthy, contextually valid quotations, documents both the debate and the ultimate failure of the Air Force and decisionmakers alike to establish a correct or relevant use of air power in counterinsurgent conflicts. Furthermore, the author correctly and damningly faults the civilian decisionmakers for having failed to correctly and relevantly see the opportunities and limitations of armed force in support of the basic political goals of achieving stability within South Vietnam. This failure colored the later, subordinate controversies concerning operational employments of the air instrument.

Chief among the subordinate controversies was the one involving the utility of air power in support of ground forces. To what extent could air power serve as an economy-of-force measure, and what sorts of operations would best develop the force-multiplier potential? Again, significant agreement between ground and air commanders or between the military and civilian decisionmakers was impeded by the lack of a clear and consistent understanding of the nature and quality of the rapidly growing war. Mrozek shows clearly that this lack of understanding ensured a palpable lack of meaningful success despite enormous efforts and impressive innovations. He implies that innovation without insight leads to empty successes.

Wars must have goals that are realistic and definable. The definition of success must be relevant to the goals. The theory of victory—the means by which success is to be achieved—must likewise be relevant to the goals. Further, it must not be captive either to the past—no matter how successful—or to a present, muddled hope. Mro-

zek's analysis underscores the saliency of these fundamentals in a convincing fashion.

Dr Mrozek is a professor of history at Kansas State University and a former senior research fellow at the Airpower Research Institute. His book is highly recommended to readers concerned with understanding and reifying the proper les-

sons of the Vietnam War so that the United States might deal more successfully with nasty, ambiguous little wars in which the role of force in support of policy is neither obvious nor certain—in short, the type of war most likely to mark the near future.

Dr Larry Cable

Wilmington, North Carolina

New From The Air University Press

The following books have recently been published by Air University Press. Department of Defense organizations may request copies from Air University Press, Walker Hall, Building no. 1400, Maxwell AFB, AL 36112-5532. Other interested parties may purchase these books through the Superintendent of Documents, US Government Printing Office, Washington DC 20402. You may charge your purchase on Visa or Mastercard. Checks should be made payable to Superintendent of Documents.

Making Strategy: An Introduction to National Security Processes and Problems by Col Dennis M. Drew, USAF, and Dr Donald M. Snow, August 1988, 209 pages, \$10.00, stock no. 008-070-00617-1.

A consideration of the elements of political and military strategy as part of the broad decisionmaking process, influenced by economic, technological, cultural, and historical factors. Covers the strategy-making process, grand strategy, military strategy throughout the spectrum of conflict, and the factors that influence the process of making strategy.

Low-Intensity Conflict in the Third World by Dr Lewis B. Ware et al., August 1988, 178 pages, \$7.50, stock no. 008-070-00609-0.

A look at low-intensity conflict throughout the world by the Political-Military Affairs Division of the Airpower Research Institute. Specialists examine each of the major areas of the world with regard to the environment for low-intensity conflict and the factors influencing each situation.

On Space Warfare: A Space Power Doctrine by Lt Col David E. Lupton, USAF (Retired), June 1988, 149 pages, \$7.00, stock no. 008-070-00608-1.

Insights into the various doctrines that govern (or could govern) military affairs in space. The book examines the historical perspective from which these doctrines are viewed and places them in the context of current space issues.

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Notices of upcoming conferences, seminars, and other professional notices of a noncommercial nature should be sent to: Editor, Airpower Journal, Walker Hall, Maxwell AFB AL 36112-5532. We reserve the right to edit material for length and editorial content.

VMI/American Military Institute Military Education Conference

The Virginia Military Institute's Department of History and Politics will host the annual meeting of the American Military Institute on 14-15 April 1989 in Lexington, Virginia. The conference theme is "Military Education and Thought." For more information, contact the AMI Conference Coordinator, Department of History and Politics, VMI, Lexington VA 24450.

Old Dominion Soviet Military Doctrine Conference

Old Dominion University is sponsoring a conference on "Soviet Military Doctrine in an Era of Change" to be held at Old Dominion University on 25-27 May 1989. For more information, contact Philip S. Gillette, Graduate Program in International Studies, Old Dominion University, Norfolk VA 23529-0088, or call (804) 440-4643.

Space Symposium

The United States Space Foundation will hold its Fifth National Space Symposium 4-7 April 1989 at the Broadmoor Hotel, Colorado Springs, Colorado. The theme of the symposium is

"Space—A New Era." For more information, contact the United States Space Foundation, PO Box 1838, Colorado Springs CO 80901, or call (719) 550-1000.

Specialized Pilot Training

The Air Force has announced that it will begin specialized undergraduate pilot training in 1991. All pilot trainees will attend a primary phase of training followed by a specialized track for either bomber-fighter aircraft or tanker-transport aircraft. The specialized track for the students will be identified before they enter the primary phase of training. Bomber-fighter students will fly T-38 aircraft in their specialized track while tanker-transport students will fly a yet-to-be-identified twin-engine aircraft.

Army Aviation Meeting

The Army Aviation Association of America's annual convention will be held 5-9 April 1989 in Atlanta, Georgia. This year's theme is "Training the Army Aviation Force." For more information, contact Bill Harris, Army Aviation Association of America, 49 Richmondville Avenue, Westport CT 06880-2000, or call (203) 226-8184.

contributors



Col Clifford R. Krieger (USAFA; MA, University of Southern California) is chief of the Strategy Division, Joint Chiefs of Staff. He has served as commander of the 86th Tactical Fighter Wing; as assistant deputy chief of staff, plans, at Headquarters USAF; and as chief of the Doctrine Division at Headquarters USAF. He is a graduate of the Royal Air Force Staff College, Army War College, Air Command and Staff College, and Air War College.



Capt Chris J. Krisinger (USAFA) is the editor of *Airlift* magazine, published at Military Airlift Command's Airlift Operations School, Scott AFB, Illinois. A C-130 pilot with more than 3,000 flying hours, he has served a tour at Pope AFB, North Carolina, and has been an exchange officer with Canadian Forces at CFB Edmonton, Al-

berta, Canada. Captain (major selectee) Krisinger is a graduate of Squadron Officer School and Air Command and Staff College.

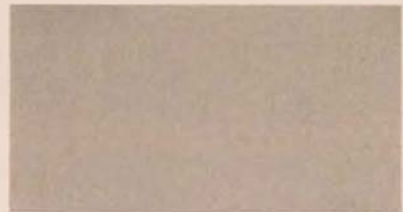


Capt Greg K. Mittelman (BA, Southwest Texas State University; MS, Troy State University) is chief, Explosive Ordnance Disposal, 3246th Munitions Maintenance Squadron at Eglin AFB, Florida. He has served as a munitions inspector for the Headquarters Pacific Air Forces Inspector General and as munitions branch chief, Osan AB, Republic of Korea, and Wheeler AFB, Hawaii. Captain Mittelman is a graduate of Squadron Officer School.



Lt Col Joe Boyles (USAFA; MS, AFIT) is an aircraft maintenance inspector

(AF/IC) for the Air Force Inspection and Safety Center, Norton AFB, California. His flying experience totals 1,700 hours, primarily as an F-4 weapon systems officer. He served as commander of the 3246th Munitions Maintenance Squadron (AFSC) at Eglin AFB, Florida. Colonel Boyles has published articles in *Flying Safety* and *Airscoop*. He is a graduate of Squadron Officer School and Air Command and Staff College.



Col A. Lee Harrell (BBA, University of Miami; MS, University of Southern California) is deputy commander for operations, 507th Tactical Air Control Wing, Shaw AFB, South Carolina. His previous assignments have included deputy commander for operations, 52d Tactical Fighter Wing, Spangdahlem AB, West Germany, and air liaison officer, 82d Airborne Division at Fort Bragg, North Carolina. Colonel Harrell is a graduate of Squadron Officer School, Air Command and Staff College, and Air War College.



Maj Andrew J. Ogan (BS, University of Kansas; MS, AFIT) is chief of supply, 513th Supply Squadron, RAF Mildenhall (USAFE). He has served in many supply-related positions, including chief of wholesale requirements policy at Headquarters USAF. Major Ogan has published articles in the *Defense Management Journal*, *Logistics Spectrum*, and the *Air Force Journal of Logistics*.



Capt Joseph F. Uдеми (BS, Texas A&M University; MS, Embry-Riddle Aeronautical University) is an A-10 aircraft maintenance officer, 23d Tactical Fighter Wing, England AFB, Louisiana. From 1985 to 1988, he was assistant professor of aerospace studies, AFROTC Detachment 880, Virginia Military Institute. Captain Uдеми is a graduate of Squadron Officer School.

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