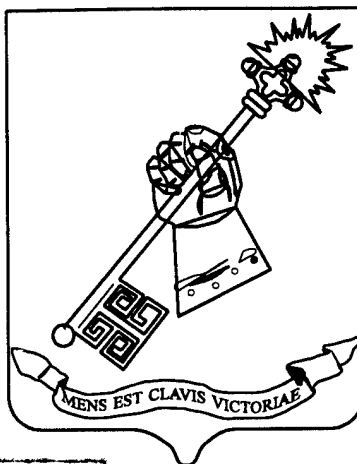


SYNCHRONIZING MANEUVER AND INTERDICTION IN JOINT OPERATIONS

A Monograph
by
Major David V. Boslego
Infantry



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ABSTRACT

SYNCHRONIZING MANEUVER AND INTERDICTION IN JOINT OPERATIONS
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The advent of air power in the twentieth century combined with the industrialization of armed forces significantly increased the means and opportunities to interdict enemy resupply and movement. While much has been written on the subjects of interdiction and maneuver as separate topics, relatively few works have considered the synchronization of the two. This monograph attempts to establish the relationship between interdiction and maneuver and to determine the techniques necessary to facilitate synchronization.

This monograph initially examines current joint doctrine and recent writings on the synchronization of interdiction and maneuver. Next, the monograph analyzes two historical examples selected for their apparent representation of synchronized U.S. combat power in twentieth century mid- to high- intensity warfare. The first vignette, MacArthur's 1943 New Guinea campaign, was chosen because a number of reference works cite it as an excellent example of joint operations in World War II. In addition, it is cited as an example of interdiction in Joint Publication 3-0, *Doctrine for Joint Operations*. The second vignette, Bradley's Normandy breakout campaign of July 1944, epitomizes the combination of ground maneuver with air interdiction to achieve decisive results. The monograph concludes by synthesizing the analysis of doctrine with the lessons derived from the two historical examples.

There are three major findings of this monograph. First, synchronization of interdiction and maneuver is a command function. For a variety of reasons, it appears from history that this synchronization is so difficult to achieve that it is virtually impossible without the commander's personal commitment and involvement. Both MacArthur and Eisenhower expended great effort to ensure a degree of success, and to some extent, even their efforts were not enough. Second, the joint force commander's concept of operation provides the principal means to synchronize maneuver and interdiction. Graphic control measures and command relationships assist in the execution but the concept of operation must explain how interdiction and maneuver contribute to the desired end state. The joint force commander must clearly communicate to his component commanders how he expects each to contribute towards accomplishment of the mission. In providing guidance for the interdiction operation, the joint force commander should identify, in general terms, what, where, and when to interdict and designate a subordinate commander responsible for the execution. Third, at the operational level, interdiction provides the means to eliminate the enemy commander's options. While physical destruction of enemy assets can contribute to the enemy's overall defeat, the benefits gained by destroying his options may produce an effect far outweighing the costs of the effort. Physical destruction may actually have an adverse effect on friendly maneuver by destroying the very road and rail networks required for friendly exploitation. Removing options by itself is not enough. The timing of the interdiction must minimize the enemy commander's reaction time and available options.

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Major David V. Boslego

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Approved by:

Clarence Edward Taylor Monograph Director
LTC Clarence E. Taylor, MMAS

Danny M. Davis Director, School of
COL Danny M. Davis, MA, MMAS Advanced Military
Studies

Philip J. Brookes Director, Graduate
Philip J. Brookes, Ph.D. Degree Program

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Section I

Introduction

In 413 B.C., the city-state of Syracuse faced a desperate situation. Besieged by the Athenians for two years, the Syracusans learned that the Athenian general Demosthenes had just landed with reinforcements to force capitulation. Determined to save the city from destruction, the Syracusan navy blockaded then destroyed the Athenian fleet in Syracuse's Great Harbor. The Athenian soldiers became demoralized at the sight of their ships sinking to the bottom of the bay. These ships provided the soldiers with their principal means of supply as well as their means of returning home. The Syracusan army then launched a breakout attack from the city to annihilate their Athenian foes. As this ancient example indicates, the concept of combining interdiction and maneuver is not a new one. The opportunities to combine them were generally limited only by the means available and the location of the belligerents. For many centuries, naval forces provided the primary means of interdicting an enemy. Armies on land moved slowly, communications were nearly as slow, and the enemy usually obtained logistics locally. Interdiction was only feasible when naval resupply or movement by sea was critical to the outcome of the campaign. The advent of air power in the twentieth century, combined with the industrialization of armed forces, significantly increased the means and opportunities to interdict enemy resupply and movement. While much has been written on the subjects of interdiction and maneuver as separate subjects, few works have considered the synchronization of the two. This monograph will attempt to establish the relationship between interdiction and maneuver as well as the techniques necessary to

facilitate synchronization.

Initially, this monograph will examine current joint doctrine and recent writings on the synchronization of interdiction and maneuver. Next, the monograph will analyze two historical examples selected for their apparent representation of synchronized U.S. combat power in twentieth century mid- to high- intensity warfare. The first vignette, MacArthur's 1943 New Guinea campaign, was chosen because it has been repeatedly cited by historians as an excellent example of joint operations in World War II.¹ In addition, it is cited as an example of interdiction in Joint Publication 3-0, *Doctrine for Joint Operations*. The second vignette, Bradley's Normandy breakout campaign of July 1944, epitomizes the combination of ground maneuver with air interdiction to achieve decisive results. This monograph will determine the factors which appear to facilitate the synchronization of interdiction and maneuver at the operational level in warfare. While the two vignettes only address a ground maneuver force with an aerial based interdicting force, the maneuvering and interdicting forces could theoretically be any combination of air, maritime, land, or special operations components.

The scope of this monograph is limited in several respects. First, this monograph is focused on methods to execute existing doctrine. Therefore, it will not debate the merits of current doctrine but instead searches for ways of implementing it. Second, it addresses operational interdiction and maneuver. As the historical examples will illustrate, there appears to be a major difference in tactical versus operational effects. To examine these operational decisions and effects, the analysis will mainly examine the actions of the senior commanders in each theater.

The central premise of this monograph is the joint force commander's (JFC) concept of operation must be the synchronizing tool for maneuver and interdiction. Effective control measures and command relationships flow from a well devised concept. To develop this concept, the JFC must first determine when and where he wants to place the enemy in a dilemma between movement and protection. Ideally, the location and time selected will provide the enemy with the least number of satisfactory alternatives. The JFC must consider several factors when deciding the location and time of the strike. Given the option of striking a reinforcing force at its base or near its destination, the latter may be preferable because the enemy will have the fewest options available for reconstituting a force. Such timing will further challenge the enemy commander to rapidly develop a coherent alternative plan. Without a synchronized operational concept, execution historically tends to focus on attainment of tactical successes. This apparent natural tendency may be attributable to the relatively rapid feedback of tactical versus operational accomplishments. Good sailors, airmen, marines, and soldiers will do their utmost to accomplish the mission. Without the JFC's overarching vision and guidance, these efforts can work at cross purposes to one another. In addition to broad concept development, the JFC must specify several critical elements in the interdiction plan to provide sufficient guidance to attain the desired effects. Guidance should specify which component or force is to conduct the interdiction, what is the intended effect of the interdiction, and generally when and where the interdiction should occur. The details of these last two items, when and where, may not necessarily specify clock time or grid coordinates, but may be stated in terms relative to the enemy force. To understand these

issues, one must first review current joint doctrine on maneuver and interdiction.

Section II

Doctrine on Maneuver and Interdiction

MANEUVER

Joint doctrine defines maneuver as the "employment of forces on the battlefield through movement in combination with fire, or fire potential, to achieve a position of advantage in respect to the enemy in order to accomplish the mission."² There are two aspects of this definition which will impact on the synchronization of interdiction and maneuver at the operational level. The first aspect, the purpose of maneuver, is simply the accomplishment of the JFC's mission. Maneuver is not an end in itself, but a method (and not necessarily the only method) of attaining the commander's desired endstate. The definition primarily focuses on the friendly force. It does not describe the effects of maneuver on the enemy other than requiring the situation at the end of maneuver to be more advantageous than before it was conducted. Clearly, this advantageous situation could take many forms. At one extreme, the friendly force, by movement and fires alone, could annihilate the enemy. At the other extreme, movement and the threat, but not employment, of fires may be enough to force the enemy to act in a manner suitable to the JFC. The important point is that maneuver is more than simply moving into a position to shoot. Effective operational maneuver may actually place the friendly force in a less advantageous place to fire on a particular enemy. The criterion for successful maneuver is not necessarily how much fire is or can be placed on an enemy unit, but the effect that

the combined movement and fire (or fire potential) has on the enemy force from the operational perspective.

The second aspect is the requirement for fire or fire potential in addition to movement. Maneuver does not exist without this fire or fire potential. Note that the definition does not state what effect this fire must have. There are several options available which may be used singularly or in combination: (1) fire which affects forces in close contact with friendly forces, (2) that which affects forces which may potentially come into contact with friendly forces as well as the elements capable of sustaining infrastructure, and finally (3) targets of a strategic nature which do not involve military forces or their sustainment. At the tactical level, the requirement for fire is often met by the ground force's organic indirect fire assets. At the operational level, the distances involved have previously made these ground based indirect assets insufficient for the task. Aerial assets have often been the optimal platform since they provided the means to both detect and destroy deep targets.

INTERDICTION

Joint doctrine defines interdiction as "an action to divert, disrupt, delay, or destroy the enemy's surface military potential before it can be used effectively against friendly forces."³ A critical aspect of the definition is that interdiction, unlike maneuver, describes an effect on the enemy, not a method of using friendly forces. While interdiction has often involved the use of fire from aerial platforms, there are other methods of execution. One example is the use of ground maneuver forces deployed deep into the enemy's rear area to achieve the same effect.⁴ Alternatively, long range indirect fire assets coupled

with aerial or space-based target detection systems could likewise achieve interdictive effects. Also, special operations forces, surface and subsurface naval systems can be effective interdictive tools. While aerospace forces have provided the preponderance of interdiction assets in the latter half of the twentieth century, it is helpful to first consider interdiction as a desired effect and then consider the wide variety of possible solutions which may accomplish that effect.

A second critical aspect of the definition is its broad application of targets that can be attacked. The "surface military potential" can take many forms and include such diverse targets as tanks and railway sidings. A 1981 RAND Note by Edmund Dews and Felix Kozackzka commented on this breadth of potential targets by stating that "almost every element of military strength and route structure can be an interdiction target, and on occasion has been."⁵ To simplify analysis, they developed a model to classify potential targets into six categories:

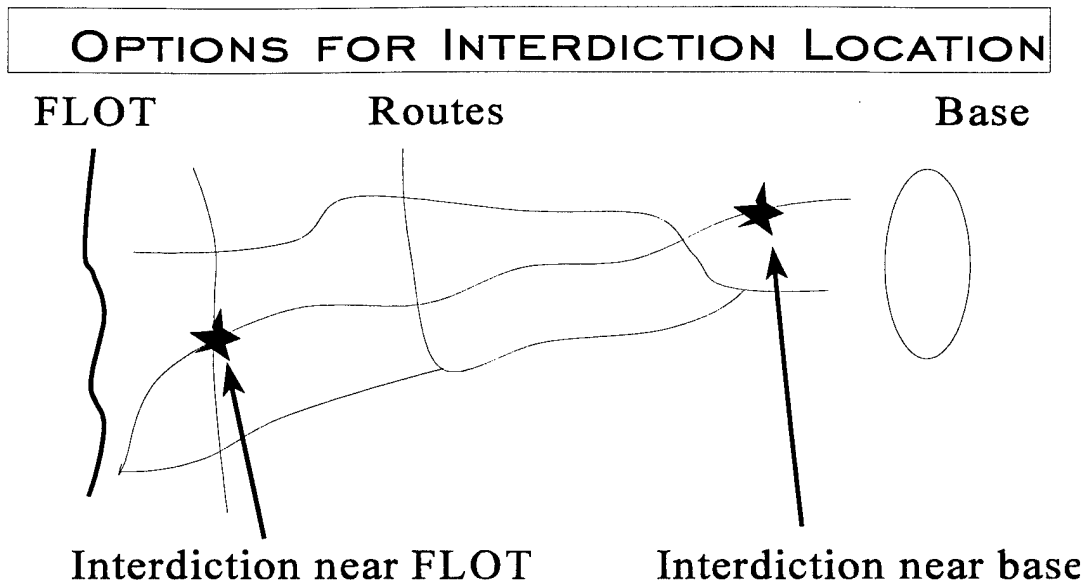
Interdiction Target Sets⁶

1. Maneuver Units (including tracked and wheeled vehicles)
2. Supply Vehicles and Support Equipment
3. Fuel
4. Supplies Other Than Fuel
5. Route Structure
6. Ground Based Air Defenses

While this list is fairly inclusive of all military activities likely to be found in enemy rear areas, it has been suggested recently that another set, long range fire support, be added.

Timing and location of interdiction appear to be two of the more important variables. Joint doctrine provides some guidance on the optimal timing of interdiction during combat by warning that interdiction executed regardless of the operational situation may be ineffective.⁷ Doctrine recommends conducting interdiction when the enemy "must move major forces and equipment rapidly."⁸ Joint Pub 3-03 (Test), *Doctrine for Joint Interdiction Operations*, describes the factors which may affect the immediacy of an interdiction operation's impact as:

1. the distance between the interdiction and the intended effect
2. the mode of enemy movement
3. the target set
4. the overall level of enemy activity⁹



Generally, the greater the distance from the interdiction location to the forward line of troops, the greater the time lag for the effect. Likewise, the target's rate of movement also affects the immediacy of impact. The destruction of a force that would otherwise reach its destination quickly will have a more immediate impact than the destruction of one moving by foot over difficult terrain. The nature of the interdiction target may also have a major impact on the effect. Generally, the more directly a target can be converted to combat power, the more immediate its impact. Thus, a combat division en route to the front would likely have a more immediate impact than a trainload of supplies. The division will likely possess combat power immediately upon arrival whereas the supplies must be distributed in order to have any value. Finally, interdiction will probably have a greater impact when there is a high level of activity. Units which are moving and fighting generally require more reinforcements and supplies than those in static positions. The impact of the destruction, disruption, or delay of these men and matériel is far greater in high activity situations.

Joint Pub 3-03 (Test) provides a format for items to be included in a concept of operations for an interdiction plan. In addition to an identification of objectives, the concept should explain the overall concept for interdiction as well as resource requirements needed to sustain the program. Finally, the plan concept should include a schedule of expected decisions needed to direct the interdiction execution.¹⁰ This monograph asserts that while this guidance may be satisfactory for interdiction operations conducted separately from maneuver, it is insufficient to ensure the synchronization of maneuver and interdiction.

A major problem with interdiction is measuring its effectiveness. Dews and Kozackzka stated in their research that most studies value an interdiction effort based on the amount of attrition imposed on enemy maneuver and logistic support units.¹¹ Thus, more destruction equates to better interdiction. While on the surface, this appears to be a reasonable method, and may be the only feasible one for mathematical analysis, this concept leads one to focus on the tactical as opposed to the operational effects. The operational effectiveness of the interdiction effort may not be directly related to the absolute number of tanks, fighting vehicles and trucks destroyed. Instead, the operational effectiveness of an interdiction effort may be best examined from its impact on the attainment of the JFC's endstate.

THE SYNCHRONIZATION OF MANEUVER AND INTERDICTION

Joint doctrine recommends that JFCs plan and execute maneuver and interdiction operations to complement one another. Joint Pub 3-03 (Test) states that "planning and conducting interdiction and surface operations within a coherent framework will enhance their synergistic effect."¹² Likewise, Joint Pub 3-0, *Doctrine for Joint Operations*, emphasizes the potential benefits of this synergy. "Synchronizing interdiction and maneuver (both land and sea) provides one of the most dynamic concepts available to the joint force."¹³ Joint Pub 3-0 recommends viewing interdiction and maneuver not as separate operations, but as complementary operations focused on the accomplishment of the JFC's campaign objectives.¹⁴ It suggests using maneuver and interdiction to force the enemy into a dilemma. If the enemy attempts to counter friendly maneuver, he is exposed to the interdiction. If he chooses to evade the interdiction effort by keeping his

forces and supplies in protected positions, he becomes vulnerable to the effects of friendly maneuver. The goal of synchronization is to place the enemy in a lose-lose situation. Apart from a perspective on the relationship between maneuver and interdiction and the attainment of a maneuver-interdiction dilemma, joint doctrine provides virtually no guidance on how to achieve the synergistic effect. A number of recent authors have proposed some techniques for achieving synchronization. These methods have mostly oriented on establishing control measures to deconflict interdiction efforts by ground and air component commanders. Additionally, some propose designating one component commander to be responsible for the entire interdiction effort.

One prominent writer on the synchronization of interdiction and maneuver was LTC Price T. Bingham. He was the chief of the Air Power Doctrine Division at the Air Power Research Institute in the late 1980s. Bingham was a contributing author for the U.S. Air Force basic doctrinal manual, AFM 1-1. Bingham was an ardent proponent of using interdiction and maneuver to force the enemy into the no-win dilemma mentioned previously. While he believed that the destructive power of air interdiction was important, as was the potential of Air Power to isolate the battlefield, neither compared to the potential of forcing the enemy into a dilemma.¹⁵ Bingham believed some interdiction efforts were ineffective because of the tendency "to treat war in the air and on the ground as separate endeavors, rather than as intimately related parts of a unified whole."¹⁶

Another explanation might be the emphasis on tactical events, instead of the campaign as a whole.

Another more recent report on the subject was prepared in 1994 by COL Daniel P.

Leaf. His research report entitled "Unity of Command and Interdiction" concluded that mutual trust between the component commanders was the single most important (and unfortunately most lacking) quality necessary for successful synchronization of forces. Leaf also recommended placing the joint force air component commander in charge of the interdiction effort, eliminating both the Joint Targeting Coordination Board and the apportionment and allocation processes.¹⁷

A third study was prepared by MAJ Jack Egginton in 1994 entitled "Ground Maneuver and Air Interdiction." Egginton's thesis was that the JFC must employ interdiction and maneuver as coequals, not simply deconflict them as separate entities.¹⁸ Egginton stated that too much of the previous analysis of interdiction and maneuver was done within the context of the tactical level of war. Although he stated his paper was focused at the operational level, his main points addressed tactical situations. Egginton saw the potential of interdiction primarily as a means of destroying the enemy's forces. He foresaw some situations where it would be more advantageous for air interdiction to destroy enemy forces rather than ground maneuver units. In such situations, Egginton argued the ground maneuver force should be the supporting effort and the air component commander the supported effort. Finally, he identified some specific environmental and tactical conditions in which each commander might be the supported effort.

As this synopsis of recent papers show, the debate over how to synchronize maneuver and interdiction is current and continuing. Joint doctrine establishes the objective of synergy but provides few techniques for attainment. While proposals by recent authors concentrate on command relationships and control measures, these

methods appear to emphasize the details of execution rather than the overarching concept. To illuminate other synchronizing methods, this monograph will next examine two historical examples of successful operational interdiction.

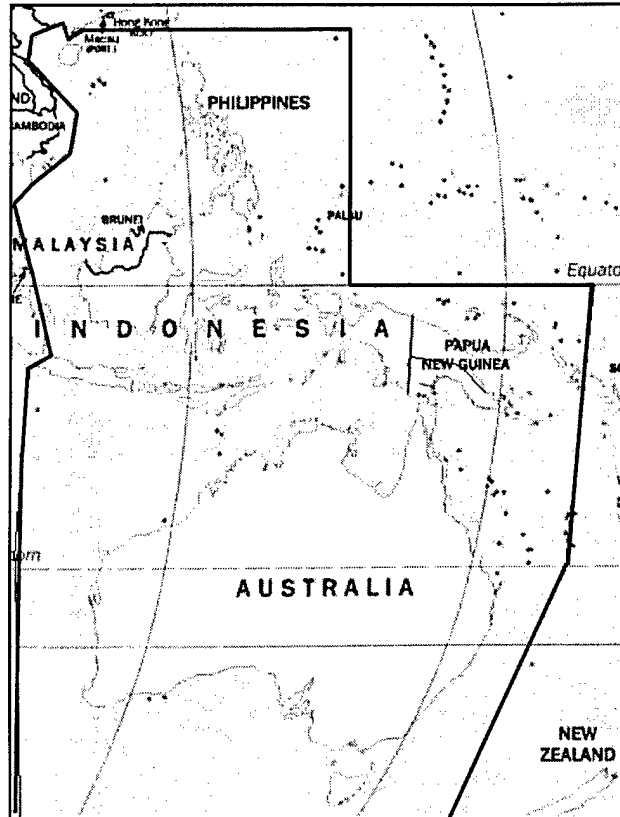
Section III

Maneuver and Interdiction in the New Guinea Campaign - 1943

A striking example of the opportunities and difficulties encountered while synchronizing maneuver and interdiction occurred during General Douglas MacArthur's New Guinea Campaign in 1943. While this interdiction effort achieved dramatic results and captured the attention of the nation for several days, the interdiction could have been better tied to maneuver to attain even greater operational results. The timing of the interdiction, the requirements for reconnaissance, and the resources dedicated to the effort are three lessons which may be useful to modern practitioners. This case study explores the synchronization of operational maneuver and interdiction in the New Guinea campaign by examining the strategic and operational situations, the Japanese strengths and weaknesses, the Allied concept of operation, the execution of the Allied interdiction, and providing an analysis of the results.

The Allied strategic situation in the summer of 1942 appeared bleak. The primarily American and British forces in the Pacific had not fared well. Since the Japanese attacked the U.S. fleet at Pearl Harbor on 7 December 1941, Singapore, Hong Kong, the Philippines, the Dutch East Indies, and the Aleutians had all fallen to Japanese forces in short order. The Japanese seemed unbeatable. To make matters worse for

American forces in the Pacific, President Roosevelt had agreed to designate the European theater as the main effort at the January 1942 Arcadia Conference. Allied commanders in the Pacific would have to make the best of the meager forces allocated to them until the war in Europe was won. Frequent reports of Axis victories in the Soviet Union and North Africa made such a possibility seem remote. The Japanese were



Southwest Pacific Area of Responsibility

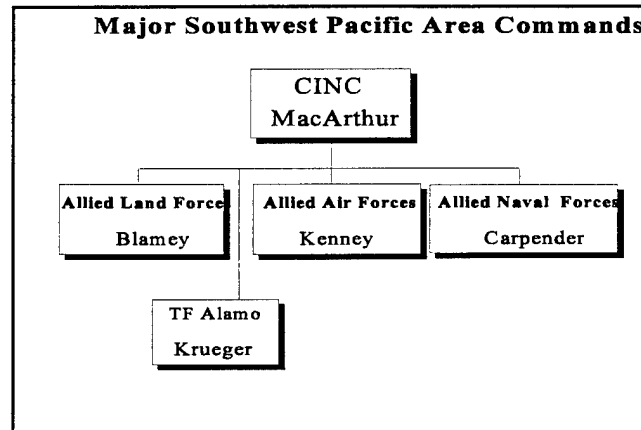
seeking to establish a barrier between the Allied bases in Hawaii and Australia and their home islands in order to protect their recent conquests from recapture.¹⁹ New Guinea was to be the southern anchor of this barrier. The Allied powers sought to protect the lines of communication between the United States and Australia.

The Allied war effort in the Pacific theater fell under U.S. strategic direction. The theater was divided among several commanders who reported directly to Washington, D.C. The largest portion was the Pacific Ocean Areas commanded by Admiral Chester Nimitz. General Douglas MacArthur commanded the Southwest Pacific Area (SWPA). MacArthur's area of operations included Australia, New Guinea, the Dutch East Indies less Sumatra, the Solomon Islands, and the Philippines. By the Summer of 1942, the

Japanese had occupied all of SWPA except Australia and the southern portion of New Guinea. A Joint Chiefs of Staff directive signed by General Marshall and Admiral King on 2 July 1942 directed an immediate offensive to seize the New Britain - New Ireland - New Guinea area. MacArthur's first task was to wrest the northeast coast of New Guinea from Japanese control. MacArthur launched the Papuan Campaign in late 1942 to capture the towns of Buna and Gona on the northeast New Guinea coast and stop the Japanese efforts to take Port Moresby. After bitter fighting, MacArthur captured the objectives in late January 1943. The proportion of casualties resulting from repeated frontal attacks against the prepared Japanese positions made this one of America's bloodiest battles of the war.²⁰ As Larry Addington stated in his book *The Patterns of War Since the Eighteenth Century*, "twice as many Allied troops died in the Papuan campaign as in the campaign for Guadalcanal, and the Buna episode perhaps taught MacArthur the importance of bypassing enemy opposition wherever possible."²¹ The next step to accomplishing his JCS directed task was to seize the coastal towns of Lae and Salamaua to the northwest.

MacArthur reorganized his SWPA command structure to achieve greater unity of command following the May 1942 Battle of the Coral Sea.²² All Allied land forces were placed under the command of General Sir Thomas Blamey, an Australian officer. This arrangement seemed appropriate given the initially preponderant Australian contribution of ground forces to the command. In practice, MacArthur, who disliked Blamey, circumvented his own command structure by establishing Task Force Alamo under LTG Walter Krueger who reported directly to MacArthur. Task Force Alamo was comprised

of the majority of U.S. ground forces in SWPA. He also assigned missions to this task force that kept it physically separated from Blamey's forces. The allied air component commander was



MG George Kenney. Kenney had taken over the poorly performing Fifth U.S. Air Force in July 1942 and immediately improved it through training and maintenance. The meager allied naval forces in SWPA, consisting of just four cruisers and a number of smaller ships, were commanded by RADM Arthur S. Carpender. The major U.S. naval component command was the Seventh Amphibious Group under RADM Daniel Barbey.²³

On the Japanese side, General Imamura commanded the Eighth Area Army from Rabaul. His subordinate, LTG Adachi, commanded the Eighteenth Army in New Guinea.²⁴ Following their loss of Buna-Gona and Guadalcanal, the Japanese reinforced their remaining holdings as part of a defensive strategy to establish a barrier around their conquests.²⁵ As part of this strategy, the Japanese occupied the New Guinea coastal towns of Madang and Wewak in December 1942 and sent a reinforced regiment of the Fifty-First Division from Rabaul to Lae in January 1943. Although the Allies detected the second group of Japanese reinforcements forming a convoy in Rabaul harbor on 30 December 1942 and again while en route to New Guinea on 6 January 1943, the Allies

were unable to effectively interdict the convoy and, consequently, the Japanese safely landed four thousand soldiers in Lae.²⁶ Encouraged by this successful reinforcement, Adachi planned to send parts of the Twentieth and Forty-First Divisions to Madang and Wewak in late January and February. An Australian force had taken nearby Wau in January 1943 and challenged Japanese control of the New Guinea coast. To counter this action, the Japanese planned to send the remainder of the Fifty-First Division to reinforce the Lae garrison in late February.²⁷ Fortunately, MacArthur correctly anticipated this move and planned to strike the Japanese enroute to New Guinea.²⁸

The Japanese had a number of notable strengths and weaknesses that would impact the upcoming battle. Although the Japanese had superior numbers of men and equipment in the region, they had surrendered the initiative after failing to capture Port Moresby in 1942. The

Japanese subsequently adopted a passive, defensive attitude.²⁹

Unlike most of their Allied opponents, the Japanese soldiers were combat experienced and would routinely fight to the death rather than surrender. Their major



Eastern New Guinea

weakness, however, was logistics.³⁰ New Guinea had an inhospitable climate and a large number of soldiers who relied on resupply from Rabaul for virtually all their needs. The Japanese position was precarious. The troops were underfed and required reinforcement to retain control of the straits separating New Guinea and New Britain as well as the adjacent seas.³¹ Additionally, Japanese aircraft production concentrated on producing combat aircraft. Lacking adequate numbers of transport aircraft, the Japanese in New Guinea were therefore dependent upon naval resupply to meet their logistics requirements for the upcoming battle.³²

With the painful memories of Buna-Gona still fresh in his mind, MacArthur planned a completely different approach for future operations. The official history of the Army Air Forces in World War II identified MacArthur's concept of basing "his tactics upon the principle that air echelons should be moved forward progressively in such a way as to provide cover for the movement of all surface elements and to assure the isolation of each objective prior to its final assault."³³ MacArthur envisioned a series of movements which would take his ground forces up the New Guinea coast toward the Philippines. Krueger's army units would embark on landing craft directly from the shore then move on these craft to their next objective. Air cover and light naval forces would protect the seaborne movement. Instead of assaulting the enemy's strength, MacArthur planned to bypass heavily fortified positions and seize more weakly held objectives.³⁴ MacArthur would thus make the strong Japanese positions irrelevant to the campaign and could reduce them at his leisure. He later stated in his autobiography "I intended to envelop them, incapacitate them, apply the 'hit 'em where they ain't -- let 'em die on the vine'

philosophy."³⁵

In keeping with his strategy, MacArthur would bypass the strongly held town of Salamana and take Lae. He planned a simultaneous airborne assault into the surrounding countryside to complement his shore-to-shore operations. MacArthur anticipated that the enemy would attempt to strengthen his existing garrisons and therefore gave his air component commander the primary responsibility of isolating the objective area. General Kenney's Fifth Air Force lacked sufficient resources to prosecute a continuous series of attacks against the base at Rabaul. Instead, he dedicated many of his long range bombers to reconnaissance missions which would detect forces en route to New Guinea.³⁶ The isolation of the objective area would have to occur in the waters off the New Guinea coast.

The Japanese were determined to hold Lae and Salamana. They planned a closely coordinated reinforcement effort. As Samuel Morrison noted in one of his many books on the history of U.S. naval operations in World War II, the Japanese operation was well planned. "The (Japanese) joint operation plan was carefully thought out and was complete in every detail."³⁷ All of the Japanese ships were combat loaded and cross loaded. The soldiers were even trained to continue disembarking during air raids. Realizing their weaknesses in the air, the Japanese convoys planned to move reinforcements to New Guinea under the cover of bad weather while marshalling what fighter aircraft were available to provide cover.³⁸ A convoy of eight warships and eight transports departed Rabaul on 28 February in the midst of a major storm. A break in the storm on 1 March allowed a flight of B-17s on a reconnaissance mission to detect the

convoy. Despite some intervening bad weather, a reconnaissance plane regained contact on the following day. This detection allowed Kenney to launch an attack by two groups of B-17s. The high altitude bombing resulted in two hits but no significant losses to Japanese shipping. Kenney unleashed all of his assets as the convoy closed on New Guinea the following day . Dozens of Beaufort torpedo planes, B-17s, B-25s, and A-20s descended upon the convoy. The crews of the B-25s and A-20s were most successful, employing their newly devised low-level bombing techniques. The attack was catastrophic for the Japanese. Of the over 6,800 Japanese soldiers that embarked at Rabaul, only 800 reached their destination. These lucky few were rescued from the sea by warships after their transports had been sunk. They arrived at Lae without any of their equipment. Another 2,427 returned to Rabaul aboard two crippled destroyers while 3,664 were lost at sea.³⁹ Many of the Japanese soldiers not killed outright were later strafed by aircraft or attacked by sharks. MacArthur was quick to publicize the success of the attack by releasing a communique on 4 March that claimed destruction of twenty-two ships and 15,000 soldiers. The story earned a banner headline in *The New York Times* in which MacArthur noted "we have achieved a victory of such completeness as to assume the proportions of a major disaster to the enemy."⁴⁰ Year later, MacArthur said that the Battle of the Bismarck Sea "was the decisive aerial engagement in his theater of war."⁴¹

Despite the tactical success of the interdiction, the attack proved to have little lasting favorable operational effect on the New Guinea campaign. Instead of causing a withdrawal of Japanese soldiers or a lessening of their will to fight, the Battle of the Bismarck Sea caused greater numbers of Japanese soldiers to be sent to New Guinea. In

the official U. S. Army history of the war, Louis Morton stated that the battle caused senior Japanese planners in Tokyo to take renewed efforts in the region since the U.S. forces appeared to be a bigger threat than anticipated.⁴² Ronald Spector , author of *Eagle Against the Sun*, stated that the battle "shocked Imperial General Headquarters into shifting the weight of Japanese military effort to New Guinea."⁴³ The resulting Army-Navy Central Agreement issued on 25 March identified New Guinea as the focus of future military effort.⁴⁴ Additional Japanese Army forces were allocated by the 18th Area Army in Rabaul and the Japanese Navy launched operation I-GO against allied facilities in major New Guinea ports. While the destruction of the Japanese convoy lessened the number of troops at Lae for the short term, it appears to have increased the number which MacArthur would have to defeat to wrest control of New Guinea.

The Japanese changed their methods of resupply and reinforcement as a result of the Battle of the Bismarck Sea. Realizing they could no longer send convoys safely to Lae, the Japanese initially sent their convoys to coastal towns further west. When even these began to be turned back, the Japanese resorted to submarines and smaller surface craft which hugged the shorelines and moved only at night.⁴⁵ The Japanese also unsuccessfully tried to build a road along the coast linking Lae with other towns to the west. Captured war documents revealed the Japanese had in fact been able to move 3,000 troops and a major portion of supplies from Rabaul to Lae during the four month period following the Battle of the Bismarck Sea.⁴⁶ Thus, the Japanese were able to recoup the majority of their losses from the air interdiction by the time MacArthur launched the land attack in September 1943.

The Battle of the Bismarck Sea provides five important lessons for the operational synchronization of interdiction and maneuver. First, time is a key determinant of interdiction's effectiveness. Without question, the attack achieved tremendous tactical success. Unfortunately, MacArthur was unable to follow up this tactical success with ground maneuver to rapidly seize Lae. The intervening nine months allowed the enemy to use less efficient, but ultimately equally effective means of getting troops and supplies to the objective area. Given sufficient time, a determined enemy will be able to adapt to the changing environment. Second, effective interdiction requires an enormous intelligence effort. For many planned ground operations, the location of the enemy is generally known. Much of the ground maneuver planner's responsibility is to determine when and how to strike his foe. Interdiction is much more complicated. Since the interdiction target is often moving, both time and route are necessary to intercept the enemy. General Kenney redirected two of his most valuable aerial platforms, the B-17s and B-24s, from bombing to reconnaissance missions in order to attain this requisite intelligence. This action allowed Kenney to have a greater likelihood of finding the enemy by multiplying the number of aircraft on patrol for the convoy. By carefully analyzing the number of ships at anchor in Rabaul harbor, he was able to determine when the next convoy would sail. This intelligence allowed him to aggregate his combat power for the decisive strike. Third, interdiction should be timed to minimize the enemy's ability to adopt a satisfactory alternative course of action. By removing options from the enemy, the commander increases the likelihood that he will correctly determine the enemy's most likely course of action. This, in turn, improves the commander's likelihood of developing a friendly

course of action to defeat the enemy. Fourth, it appears easy to confuse the tactical effects of an action with the operational effects. As this example illustrates, it is possible for a great tactical victory to actually hinder the JFC's attainment of his desired end state if tactical operations are not carefully synchronized. The end state in MacArthur's campaign was to seize the Philippines. His victory in the Bismarck Sea arguably resulted in more Japanese forces being put in his path than the enemy had previously planned. This leads to a fifth point. An action only has an operational impact to the degree that it furthers or degrades attainment of the JFC's end state. Thus, regardless of the location or size of forces involved, any event in the area of operations could have or fail to have an operational impact. The Battle of the Bismarck Sea could thus be classified as a tactical victory but an operational defeat. It was a tactical victory because of the losses suffered by the Japanese relative to the Allies and the failure of the Japanese reinforcing force to reach its objective. It was an operational defeat because the action ultimately strengthened the Japanese commander's ability to protect his conquests in the Dutch East Indies while making MacArthur's goal of retaking the Philippines more difficult to attain. Synchronizing interdiction and maneuver proved to be just as difficult in the European theater.

Section IV

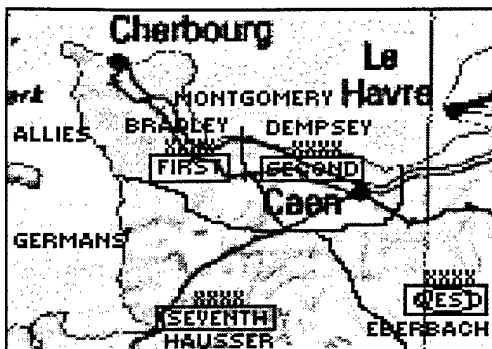
Maneuver and Interdiction in the Normandy Breakout Campaign - 1944

Another example of the opportunities and difficulties encountered in synchronizing maneuver and interdiction occurred during General Omar Bradley's

Normandy Breakout Campaign in 1944. This attack, code named Operation COBRA, was designed to free the Allied forces from the compartmentalized terrain of Normandy. A key aspect of the campaign was the integration of maneuver and interdiction to achieve decisive results. The effects of interdiction on the enemy's maneuver forces are noteworthy for analysis by modern practitioners. This vignette examines the strategic and operational situations, the German strengths and weaknesses, the concept of operation, the execution of interdiction, and then analyzes the results.

The Allied strategic situation in July 1944 was grim. Despite initial success in securing a foothold on the continent in June, the Allied advance on Germany was far behind schedule. The Allied armies had expected to have captured the whole of

Normandy and Brittany by the end of July. They



Normandy Area of Operations
July 1944

had not advanced more than twenty miles from the invasion beaches in Normandy. Only a fraction of Normandy had been liberated. The Allied gains after seven weeks of fighting amounted to what they had expected to accomplish by D+5.⁴⁷ The terrain was a greater

obstacle than anticipated. The *bocage* country contained hedgerows between every field which proved an ideal defense for the Germans. The mostly inexperienced Allied forces had a difficult time wresting each acre from the Germans. The attack on St. Lô in mid-July had cost the five attacking American divisions eleven thousand casualties over twelve days.⁴⁸ Another problem was the attrition suffered by American units in contact.

The constant fighting created a severe turnover of infantry soldiers.⁴⁹ The replacements rarely had time to integrate with the experienced veterans before the unit had to fight again. This created conditions in which unit performance suffered. Attacks launched by the U.S. 83d and 90th divisions in July failed to attain their modest objectives.⁵⁰

The command structure in the European theater resembled MacArthur's in the New Guinea example. General Dwight D. Eisenhower commanded the combined Allied Expeditionary Force. His component commanders were General Bernard Montgomery, Air Marshal Sir Tafford Leigh-Mallory, and Admiral Sir Bertram H. Ramsey.⁵¹ An important aspect of COBRA was that Lieutenant General Omar N. Bradley personally developed the plan.⁵² Bradley, commanding First U.S. Army, was Eisenhower's subordinate and did not have authority over Air Corps or other Allied units. It is a tribute to all involved that Bradley developed the plan for the theater and that Eisenhower recognized the its merits and incorporated theater forces to help make it successful. Major General Lewis H. Brereton's Ninth Air Force provided the bulk of the air assets that supported this plan. In addition, heavy bombers from the Eighth Air Force, normally dedicated to strategic attacks against Germany, also provided support for this operation.⁵³ General Montgomery, Bradley's superior commander in Normandy, agreed to support the operation by launching his own attack to draw German units to the Caen area, away from the American zone. Thus the Allied attack, while conceived by Bradley, was essentially a combined, theater-level campaign.

On the German side, preparations for the continued defense of Normandy were inadequate. SS General Paul Hausser commanded the German Seventh Army and was

responsible for the defense of the western half of the German line across Normandy.⁵⁴ At his disposal were the LXXXIV Corps, commanded by General Choltitz, and the II (Parachute) Corps, commanded by General Meindl. Hausser's Seventh Army had a broad mix of forces which included non-German divisions stiffened with German leadership, standard dismounted infantry divisions, determined Parachute organizations, and two heavy formations - the Panzer Lehr division and the 2d SS Panzer Division. To the dismay of General von Kluge, his operational superior, Hausser decided to place his heavy units in the main line of resistance rather than forming a mobile reserve.⁵⁵ Kluge had warned Hausser several days before the Allied attack, "If there is a breakthrough anywhere along the line, you will have no way to react."⁵⁶ Hausser rationalized the decision to leave his armored forces in place by stating that the heavy units would strengthen the defensive line.⁵⁷ Instead of mobile, armored forces, Hausser kept the 275th Division, a standard infantry unit, as his army reserve. Choltitz also designated a reserve at corps level, placing a reinforced regiment from the 353d Division to the rear of his main line of resistance. This organization for the defense was to plague the German efforts to repel the Allied attack.

The Germans had a number of strengths and weaknesses which would impact on the upcoming battle. One strength was combat experience. A number of the units participating in the battle had consisted of soldiers who had fought recently on the Eastern front. Some of these soldiers had sustained wounds in Russia and were sent to France to recuperate. In contrast, Allied troops generally lacked combat experience. Another German strength was tenacity. German soldiers could be relied upon to continue

fighting in adverse operational and environmental situations. Isolated German units were known to keep fighting for months after being surrounded. According to Martin Blumenson in the Army's official history of World War II, the majority of enemy soldiers captured since the invasion were actually non-German volunteers from occupied territories. While the German forces were combat experienced and noted for their tenacity, a number of their units were understrength in both equipment and men. From the German perspective, the war against the Soviet Union was the principal threat to Germany and therefore received priority of men and materiel. Other fronts, such as France, had to provide resources to the main German effort. Losses from combat in Normandy far surpassed replacements. Since the June invasion of Normandy, the Germans had received only 14,594 replacements for 127,247 casualties.⁵⁸ Also lacking was air support. The Allied air forces had air supremacy. The Germans were unable to effectively interfere with Allied fighters or bombers executing their missions. A report by Rommel, then commanding the group of armies in northern France, to OKW (*Oberkommando der Wehrmacht*, the German High Command of Armed Forces) on 11 June described the effects of this air supremacy on German activities. "The enemy has complete command of the air over the battle up to about 100 kilometers behind the front and cuts off by day ... almost all traffic on roads, by-roads or in open country. Movements of our troops on the field of battle by day are thus almost entirely prevented, while the enemy can operate freely."⁵⁹ Finally, Hausser had a poor working relationship with both his superior, Kluge, and one of his subordinates, Choltitz. Kluge had suggested Hausser form a mobile reserve with his armored formations prior to the battle, but

Hausser had been insistent on putting them into the main line of resistance. Martin Blumenson characterized Hausser's relationship with Choltitz as being "founded on a lack of mutual trust, co-operation, and understanding that bred confusion."⁶⁰ Given the shortages of equipment and men, lack of air support, and shaky command relationships, the Germans would have a difficult time countering any Allied offensive.

By 11 July 1944, Bradley personally formulated his plan for a breakout from the Normandy lodgement.⁶¹ The essence of the plan consisted of a penetration by General Collins' VII Corps in the center after which the corps was to encircle the German forces along the west coast of Normandy by seizing Constances. General Middleton's VIII corps, in the west, was to launch a supporting attack to exploit the destruction of German resistance and break out of Normandy. Air power was to be a vital part of the plan. The most notable aspect of the air operation was the employment of a technique called "carpet bombing" on front line German units immediately facing the VII Corps. Bradley wanted to create a gap through which he could send his divisions toward their objectives. Carpet bombing was not a new idea but was to be executed on a scale never seen before. Bradley wanted to supplement the firepower provided by over 1000 guns with the firepower of aerial bombardment to destroy all resistance in his path.⁶² To achieve this end, the Eighth Air Force's heavy bombers were placed under Eisenhower's operational command and directed to unleash their bombs on a small portion of the German front opposite Collin's corps. The use of strategic bombers in close support of friendly troops was highly controversial and continues to receive the preponderance of attention in histories of the campaign. Less well known was the interdiction effort which may have made a more

important contribution to the campaign's success.

The close cooperation of Generals Bradley and Brereton ensured that the campaign's interdiction efforts were closely synchronized with maneuver. In many ways, the interdiction planned for the Normandy breakout resembled the interdiction prior to the Normandy invasion. This previous effort sought to isolate the invasion area from reinforcements by destroying the railroad system in northwestern France as well as bridges across the Seine downstream of Paris. The interdiction plan developed in July for the Normandy breakout likewise required the Ninth Bomber Command to strike German reinforcement routes into the German Seventh Army sector opposite First Army.⁶³ Instead of attempting to strike moving columns, the plan took advantage of the rivers that defined the area of operations. For the breakout operation, the Ninth Air Force planners selected sixteen bridges along the Sienne and Vire Rivers where the columns would have to cross. The plan also preserved critical bridges that friendly forces were to use during the exploitation. Throughout the month of July, Ninth Bomber Command's light and medium bombers were to destroy these bridges and isolate the battlefield. A close examination of the campaign indicates that this interdiction at critical times and places was crucial to the overall Allied success.

To assist Bradley in executing the breakout, Montgomery launched Operation GOODWOOD on 18 July. The main purpose of GOODWOOD was to deceive the Germans as to the location of the Allied main attack and draw German forces to the east, away from Bradley. In spite of its conception as a diversion, both Montgomery and Eisenhower hoped that the operation would ultimately result in a breakout from

Normandy. GOODWOOD was tremendously successful as a diversion but failed to effect a breakout after three days of difficult fighting. The Germans repositioned forces from the First U.S. Army sector to strengthen the units facing the British Second Army offensive. GOODWOOD ground to a halt. Bradley was determined not to meet the same fate.

The execution of the plan brought mixed results. The carpet bombing on 25 July 1944 was less effective than expected and achieved unwanted notoriety due to the 111 friendly fatalities caused by short bombing.⁶⁴ These fatalities included the death of LTG Leslie McNair who was slated to take command of the fictitious First U.S. Army Group. Although many positions in the target area were destroyed by the bombing, others were untouched and the German soldiers occupying them vigorously fought the advancing American forces. Thus, instead of creating a penetration box through which forces could advance unmolested by the enemy, the carpet bombing simply attrited somewhere between ten and thirty percent of the German soldiers in the target area.⁶⁵ The leading infantry divisions did not attain their objectives. Nevertheless, LTG Courtney Hodges, Bradley's deputy commander, believed that enemy resistance was crumbling and committed the armored divisions to exploit the breach. Fortunately for the American forces, the carpet bombing expended most of its ordnance upon Hausser's most mobile and heavily armored force, the Panzer Lehr division. Both Hausser and Choltitz sent their reserves to the penetration box on 25 July. These forces, however, proved too meager to contain the attack.

The interdiction effort appears to have successfully destroyed the German's

largest, immediately available reserve. It was less successful at isolating the area of operations from theater-level forces. Hausser's Seventh Army reserve, the 275th Division, was severely mauled by fighters while trying to move to breach the gap created by the carpet bombing on 25 July. The weakened reserve proved ineffective at restoring the line. Thus, Hausser's principal means of defeating the American offensive was rendered ineffective before it ever got into action.⁶⁶ Interestingly enough, this was one of the few German units identified in the numerous accounts of the campaign as being seriously impaired by aerial attack. Many other German units were attacked while moving but managed to continue with their mission. The destruction of the bridges had little effect on the critical stages of the operation since von Kluge's only effort to move reinforcements into the Seventh Army sector was the XLVII Panzer Corps attack on 28 July. This attack, originating in the Panzer Army West sector to the east, was intended to plug the gap between the German LXXXIV and II Parachute Corps. Harassed by air attacks, this effort was only stopped when ground elements of the U.S. XIX Corps secured key terrain and prevented further movement westward. Additionally, Collins learned that all the targeted bridges had not been destroyed. He ultimately had to send Combat Command B from the Second Armored Division on a mission to block escape routes out of the area of operations.⁶⁷ Thus, the concerted effort to isolate the battlefield appears unsuccessful. The targeting of bridges seemed a logical means to accomplish the mission, however the aircraft did not have the needed delivery precision to achieve the desired effect. Also, the targeting of the bridges indicated some belief that a relief effort would come from the south or southeast. Von Kluge's reaction to the interdiction was to

choose units which could move directly to the threatened area. While far from isolating the battlefield, the interdiction effort appears to have reduced some of the options available to the German theater commander.

The Normandy Breakout Campaign provides three important lessons in the operational synchronization of interdiction and maneuver. First, interdiction's greatest contribution towards accomplishment of the JFC's end state appears to be reduction of the options available to the enemy commander. Destruction of the enemy's combat power may be a collateral, but secondary benefit of interdiction. While efforts to destroy the enemy's ability to move troops and supplies from bases to the front can weaken the enemy's combat power, attacks on the transportation system may also have an adverse effect on friendly maneuver. The destruction of the rail system in northwestern France caused the Allies to rely completely on motor transport after the breakout from Normandy. This mode of transportation proved incapable of sustaining the offensive against the Germans in the Fall of 1944. As B.H. Liddell-Hart noted in his book *Strategy*, "the bombing that had been so useful in paralyzing the German counter-measures against invasion became a boomerang when the Allies needed to maintain the momentum of their pursuit."⁶⁸ Blumenson's comparison of Operations GOODWOOD and COBRA indicated that the deciding factor in the former's failure and the latter's success may have been the availability of a mobile reserve early in the battle. In GOODWOOD, Eberbach used battalions from the 1st SS and 21st Panzer Divisions to counterattack the British forces moving through the gap created by the carpet bombing near Caen.⁶⁹ In COBRA, Hausser only had a dismounted force which was easy prey for

the fighters of the Ninth Air Force.

The second lesson was timing of the interdiction effort is critical for synchronization with maneuver. Reducing an enemy's options can be decisive only if the enemy does not have the opportunity to develop and implement alternative courses of action. In this example, interdiction timed to destroy the reserve as it was about to be employed eliminated any option Hausser had of stemming the breakthrough. Hausser's superior commander, von Kluge, ultimately had to pull forces from Panzer Army West's sector to remedy the problem. Unfortunately for von Kluge, by the time he was able to form this force, the Allied penetration was complete.

A final lesson from the Normandy breakout was the importance of command involvement when synchronizing interdiction and maneuver. The accounts of the campaign are replete with instances of the senior Army and Air Corps commanders personally coordinating activities with the other. This close relationship resulted in major advances in air-ground cooperation such as attaching experienced pilots to maneuver units as air liaison officers to coordinate close air support and collocating major ground and air headquarters.⁷⁰ This close cooperation resulted in the interdiction effort having results which facilitated the Allied forces' ground maneuver while frustrating the enemy's reaction. The ultimate compliment to the effectiveness of the synchronization of interdiction and maneuver came from the enemy commander, General von Kluge, who notified Hitler of the breakthrough on 31 July. Von Kluge identified one of his main causes of difficulty: "The enemy air superiority is terrific, and smothers almost every one of our movements...Losses in men and equipment are extraordinary."⁷¹ Personal

involvement of the commanders created a climate of cooperation which contributed to effective interdiction and the attainment of the JFC's end state.

Section V

Conclusions

As the opening example from the Peloponnesian Wars indicates, the concept of combining interdiction and maneuver is not new to warfare. For many centuries, naval forces provided the primary means of interdicting an enemy. The industrialization of society combined with the development of aerial platforms in the twentieth century have provided increased opportunities and methods to combine interdiction and maneuver in battle. The Allied commanders quickly developed an appreciation of interdiction's potential contribution to mission accomplishment in World War II. "Once control of the air could be maintained, interdiction proved to be the most effective mission for tactical air power in World War II and Korea. During World War II, 80 to 85 percent of the tactical air effort was devoted to counter air and interdiction."⁷² Many of these efforts at employing aerial interdiction attempted to isolate the a portion of the battlefield from receiving additional forces and necessary supplies. These isolation efforts appear to be beyond the capabilities of currently available means. Instead, interdiction in conjunction with maneuver seems to be much more effective at limiting the adversary's options and reaction time.

Joint doctrine provides adequate definitions of maneuver and interdiction but provides scant guidance on methods or procedures for combining the concepts. Joint

doctrine defines maneuver as the combination of movement and fires, or fire potential, to place the enemy at a position of disadvantage. Interdiction describes actions to divert, disrupt, delay, or destroy the enemy's surface military potential before it can be used effectively against friendly forces. Synchronization, the ability to focus resources and activities in time and space to produce maximum relative combat power at the decisive point, is a means of combining maneuver and interdiction to achieve a synergistic effect. The measures proposed by recent authors to remedy the lack of techniques and procedures for deconflicting activities by the component commanders appear to be useful but fail to achieve the desired synergistic effect. The use of boundaries and command relationships can help to prevent interference in one another's operation. Unfortunately, deconfliction, the lessening of the undesirable effects of working together, falls short of the goal of synchronization whereby the positive aspects of working together make the joint effort greater than the sum of the component's contributions.

The review of doctrine, recent essays, and two case studies from World War II indicate three major conclusions concerning techniques for effecting synchronization: the requirement for command involvement, the importance of the concept of operation, and the need to focus on reducing the enemy commander's options. First and foremost, synchronization of interdiction and maneuver is a command function. For a variety of reasons, synchronization is so difficult that it is virtually impossible to achieve without the commander's personal commitment and involvement. Both MacArthur and Eisenhower expended great effort and in fact achieved a degree of success but even their efforts were not enough. The focus of the theater air and ground component commanders

can be inherently so divergent that without the JFC's personal involvement, effective synchronization becomes extremely difficult to achieve.

Secondly, the JFC's concept of operation provides the means to synchronize maneuver and interdiction. While the concept of operation is the tool, most essential is a determination of the JFC, clearly communicated to his subordinates, of how he expects his component commanders to contribute towards accomplishment of the mission. The essence of this concept is the JFC's vision of how he wants the component commanders to contribute towards his mission accomplishment. In providing guidance for the interdiction operation, the joint force commander should specify what, where, and when to interdict and designate a subordinate commander responsible for its execution. The subordinate commander will then determine the means and method of interdiction and coordinate as necessary for additional resources and control measures.

Thirdly, at the operational level, interdiction provides the means to eliminate the enemy commander's options. While physical destruction of enemy assets can contribute to the enemy's overall defeat, the benefits gained by eliminating his options may produce an effect far outweighing the costs of the effort. Physical destruction may actually have an adverse effect on friendly maneuver by destroying the very road and rail networks required for friendly exploitation. Removing options by itself is not enough. The timing of the interdiction must give the enemy commander the minimum amount of reaction time to recover. In the New Guinea example, MacArthur's destruction of the Japanese reinforcements was a dramatic tactical accomplishment. Unfortunately, since he did not launch the ground attack for six months, the Japanese were able to devise other means of

getting men, equipment, and supplies to the garrison. In the Normandy example, destruction of bridges over the Seine and Loire rivers reduced von Kluge's options for moving his reserve force into the area of operations. The problem with destroying the bridges over a period of months was that von Kluge knew of their destruction and could make alternate plans.

As joint doctrine states, the goal of synchronization is to achieve a situation where the interdiction effort and maneuver complement one another. Such a goal requires a degree of flexibility in minds of commanders and planners. MacArthur, in his autobiography *Reminiscences*, reminded military planners that "new conditions and new weapons require new and imaginative methods for solution and application. Wars are never won in the past."⁷³ The challenge for planners is to keep the mental flexibility that will allow them to apply new and imaginative methods to achieve the synchronization of interdiction and maneuver.

ENDNOTES

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3. *Ibid.*, 192.
4. See Mike McMahon's monograph "Infantry Behind the Lines -- Still a Viable Concept?" School of Advanced Military Studies, U.S. Army Command and General Staff College, December 1993 for an interesting analysis of using ground maneuver forces to conduct interdiction.
5. Edmund Dews and Felix Kozaczka, "Air Interdiction: Lessons from Past Campaigns." (RAND Note N-1743-PA&E, September 1981), v.
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11. Dews and Kozaczka, 9.
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40. "M'Arthur Fliers Destroy 22 Japanese Ships; Enemy Loses 15,000 Men in Convoy, 55 Planes; Russians Capture Rzhev, Nazi Strong Point," *The New York Times*, 4 March 1943, 1.
41. "Bismarck Sea Air Victory 'Decisive'" *The Washington Post*, 4 Sep 45, 2.
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48. Ibid., 51.
49. Blumenson noted that some units had a 100% turnover in enlisted infantrymen and 150% in infantry officers. See Martin Blumenson, *Breakout and Pursuit*, U.S. Army in World War II, European Theater of Operations, Washington, D.C.: U.S. Army Center of Military History, 1961, 198-204.
50. Ibid.
51. U.S. Army, *The Second World War: Europe and the Mediterranean, Volume II* (West Point, NY: Department of History, USMA, 1980), 486. Montgomery was the temporary ground

commander. Eisenhower planned on personally controlling both army groups after his headquarters moved into France.

52. Ibid., 556.

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54. Hausser was the first SS general to command a Wehrmacht army. Upon assuming command in June, Hausser sent SS NCOs into each unit and authorized them to shoot anyone who attempted to surrender.

55. Hausser was under the operational control of von Kluge, but reported to Himmler on administrative matters. Von Kluge commanded all German forces in France.

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60. Blumenson, 327.

61. Ibid., 187.

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