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APPLICATION OF THE OPERATIONAL
ART TO THE NATO AIR ELEMENT

A Monograph

by

Colonel Ronald E. Curry

Air Defense Artillery

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School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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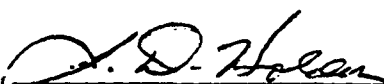
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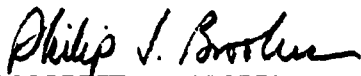
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ABSTRACT

APPLICATION OF THE OPERATIONAL ART TO THE NATO AIR ELEMENT

This monograph examines the applicability of the operational art practiced by land commanders to air campaign planning. It focuses on the role of U.S. Army Air Defense systems in operational maneuver and particularly seeks to determine if the same basic tenets used by land campaign planners are adaptable to the theory of integrating the air campaign into support of an operational maneuver by a U.S. corps in NATO.

The "air element" is a phrase used to imply airspace as it is affected by both the air defense forces, to include U.S. Army Air Defense systems, and offensive air forces.

The author presents a familiar historical example from World War II to emphasize the lessons history has already taught us about integration of operational level land and air campaigns. He then reviews the NATO environment, describing the roles of the major commanders, the staff agencies, and the processes that are involved in air element planning. Future U.S. Army Air Defense systems are reviewed to establish the impact they may have on future air element planning. An investigation of the applicability of the operational art of warfare to planning a theater air campaign is then conducted. Using a hypothetical scenario, as a catalyst, tenets of the operational art subsequently are applied to objectives of the air campaign.

Finally, conclusions are drawn pertaining to the ability of existing NATO structures to plan for air element support of operational maneuver of a corps, the role of U.S. Army Air Defense systems in operational maneuver, and the applicability of the tenets of the operational art practiced by the land component operational commander to air campaign planning.

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PART ONE

INTRODUCTION

This paper grew from the interest of the author to better understand the NATO "air element," a phrase which will be used throughout the paper to imply airspace as it is affected by both air defense forces and offensive air forces. As the paper was being planned, the eight Advanced Operational Studies Fellows at the School of Advanced Military Studies were tasked to prepare a study on operational maneuver of a heavy corps for the Supreme Allied Commander Europe, Gen John R. Galvin. The bold turn of General Patton's 3d Army North to the Ardennes following the Lorraine campaign in 1943 was given as the example of the type of move that could be considered. The group was challenged to determine whether the staffs of the Army of Excellence and the NATO Alliance were prepared to cope with a similar short notice mission in wartime. From this tasking, the author developed a personal interest about how the "operational art" studied within the fellowship could be applied to the air element.

The topic for GEN Galvin dealt with operational maneuver, which has several definitions. The Army's Field Manual 100-5 states "Operational maneuver seeks a decisive impact on the conduct of a campaign. It attempts to gain advantage of position

before battle and to exploit tactical successes to achieve operational results." ¹ Operational maneuver normally also involves the movement of large forces to achieve operational results. The following study, which centers on the relationship of the operational art as it can be applied to the air element in support of operational maneuver, is presented in an attempt to collect and reduce to a simple understanding the doctrinal air element planning processes that currently exist within NATO. It also examines their effectiveness in planning support of operational maneuver by a corps within the NATO environment.

During its 40 year history, the NATO Alliance has been based on mutual defense. The recent emphasis within the US Army on the operational level of war generates questions for those not familiar with the inner workings of NATO. How prepared is NATO to incorporate planning and execution for support from the air element for offensive maneuver of large units by operational commanders?

A familiar historical example is presented first to establish for the modern staff planner the importance of the lessons which can be learned about the air element as it has previously affected large scale maneuver during war.

Throughout the development of the NATO defense, well established staff agencies and procedures have evolved which link together those forces responsible for operations within the air element. These will be reviewed and examined, along with U.S. Army air defense system modernization, to determine current planning and execution capabilities within what is described as a mature theater.

To better understand this environment, the author seeks to determine if the tenets of operational art be applied to campaign planning for the air element within the current NATO structures. He also seeks to determine what role U.S. Army Air Defense systems play in operational maneuver and whether existing NATO staff structures and staff processes will support operational planning within the air element. It is assumed that the reader has a basic knowledge of the operational tenets which are part of today's Army doctrine.

The basis for determining the answers will lie in an analysis of the capabilities of the various commanders and agencies to apply the operational art to the air element. Both Joint and NATO directives will be reviewed and examined. Current staff agencies, procedures, and force structures will also be reviewed to determine if the concept of operational maneuver is supported. Impediments to successful application of air element support to operational maneuver will be identified.

Italics used throughout the paper are those of the author; they have also been included within some quotations to add emphasis to key phrases.

PART TWO

OPERATION OVERLORD -- A HISTORICAL PERSPECTIVE

A familiar World War II example provides a perspective on the critical role planning for the air element plays on the modern battlefield. The Normandy invasion provides an example of successful planning and execution of an operational air campaign. The success of operation OVERLORD is well known; this example concentrates on the effort of operational planning for the air element of the campaign. OVERLORD also demonstrates a shift from a defensive air campaign during the Battle of Britain to one directed toward achieving air dominance.²

Planning emphasis was placed on how the months prior to execution of OVERLORD should be spent to ensure operational success. The Allies had actually achieved daylight air superiority in February of the same year (during the same timeframe, the Germans were planning to concentrate their air forces on destruction of the Soviet aircraft production capabilities).³ The Allied challenge was to ensure total air supremacy during OVERLORD. Early in 1944 the Germans had attempted to take the attack to Britain and destroy or at least identify invasion forces; they failed in this attempt. More important, these raids resulted in a significant degradation of their bomber force, which

ultimately contributed to their inability to challenge OVERLORD
4
with air power.

During the planning process, The Economics Objectives Unit of the Economic Warfare Division of the U.S. Embassy in London developed prioritization of targets linked to the strategy of the war and its timing; a method of analysis was used to determine which targets were most closely linked to the enemy's
5
ability to conduct war.

The war was almost certainly not winnable without mastery over the German fighter force and virtually total air supremacy over the battlefield on D-Day and in the critical period of consolidating the Normandy bridgehead on the Continent. 6

After an extensive period of strong discussions over the approach the Allied air forces should take, on April 17, 1944 General Eisenhower issued the following directive to the commander of the U.S. Strategic Air Forces in Europe:

OVERALL MISSION

1. ... Our re-entry on the Continent constitutes the supreme operation for 1944; all possible support must, therefore, be afforded to the Allied Armies by our Air Forces to assist them in establishing themselves in the lodgment area.

PARTICULAR MISSION

2. The first pre-requisite of success in the maintenance of the combined bomber offensive and of our re-entry on the Continent is an overall reduction of the enemy's air combat strength and particularly his air fighter strength. The primary role of our Air Forces in the European and Mediterranean theaters is, therefore, to secure and maintain air superiority. 7

The directive goes on to establish that the air forces should first deplete the German air force and the bases supporting them and disrupt or destroy enemy rail. These actions were to be accomplished prior to the OVERLORD assault.

The planning given the air campaign and its clear relation to the sea/land campaign clearly indicates that the Supreme Headquarters Allied Expeditionary Force had integrated the air element into their thinking. Eisenhower's order issued on 17 April 1944 was not ambiguous -- it clearly established his priorities for the initial phase of the air campaign. It has been criticized for neglecting targeting of other logistical facilities, particularly petroleum stores. The fact that previous and subsequent bombing of oil facilities definitely affected the ability of the German fighter aircraft to function, however, points out the importance of prioritizations set for the air element by the highest levels of command. The order also did not account for the German ability to repair disrupted rail facilities rapidly, but air supremacy was, nevertheless, achieved for the operation. The isolation of the Normandy battlefield from the influence of the enemy air element clearly occurred through operational air interdiction.

This isolated example establishes several points which will be reiterated in this study of the modern application of the air element in support of operational maneuver. Air campaigns integrated with land campaigns support operational maneuver and lead to strategic victories. The operational commander must establish operational priorities for the air component commander. The closer the relationship between the air and land component commanders, the more effective is the support of the air element. Finally, air power must be concentrated and synchronized with the ground battle.

PART THREE

THE NATO STRUCTURE -- ROLES, STAFFS, AND PROCESSES

A basic understanding of the current structure of NATO, particularly as it relates to air forces and air defense systems in place, is necessary before determining if the operational art can be directly applied to the air element.

Although history has presented us with valuable lessons concerning the influence air warfare has over the land campaign, the character of that influence has changed radically since World War II. The 1973 Israeli war graphically pointed out both the lethality of ground based surface to air missile systems and the ability of determined, tactically proficient air forces to counter enemy air defenses. The Warsaw Pact ground based air defense systems which are positioned to defend against the NATO threat are an incredible array of force; these air defense systems will certainly hamper offensive Allied air operations. The impact of technology on the air element has progressed rapidly, with air breathing threat aircraft now capable of releasing munitions from great ranges (particularly against air defense radars) with extreme accuracy.

The NATO Theater

NATO ground forces will not be able to assume they have air superiority; it will be difficult to achieve, and it is

critical to the success of all significant ground operations. The role of the theater commander in establishing an integrated land and air campaign has, therefore, become critical. NATO land force commanders, with the commander of AFCEM in the lead, must consider complementary planning of the air campaign as a logical and significant extension of the operational art. It has been stated that

. . . NATO planners tend to focus their efforts as much on the transition from peace to war as on the prosecution of the war itself. As a result of all the foregoing considerations, the concept of a campaign plan is not embodied in NATO's peacetime planning procedures. The result of this lack of campaign planning in peacetime is that there is little operational guidance concerning how SACEUR (Supreme Allied Commander Europe) will fight after the first phase (general defense) of war. ?

This charge may have basis but, as evidenced by the tasking that initiated this study, senior commanders are generating active thinking among their staffs in campaign planning and maneuver. Operational commanders who follow these philosophies in peacetime can gain the advantage of position before battle, both in the land and air campaign. Echelons above corps should focus on controlling the air environment and protecting nuclear options, air bases, reinforcing assets, sustaining assets, and Command, Control, and Communications (C3) nodes. Operational maneuvers are normally directed by the Army Group commander or a higher authority, but operational planning for the effects of air should normally start with the theater commander.

It is imperative that the air campaign support the operational maneuver through complete integration and synchronization with the ground campaign plan. Centralized air planning will be carried out by a joint Armed Forces Central

Europe (AFCENT) and Allied Air Forces Central Europe (AAFCE)
11
staff. This planning can be complicated by the mechanics of
communication.

When communication is required between elements of the
same nationality within NATO, it is provided by the concerned
nation. However, offensive air support (OAS) coordination may
require communications between elements of different nations.

In cases where an international operations center is ...
required to conduct or assist in OAS operations, a
communications complex should be provided for the center
as directed by SHAPE (Supreme Headquarters Allied Powers
Europe) and to the appropriate national level. 12

Allied Air Forces Central Europe

The Commander of Allied Air Forces Central Europe
(COMAAFCOE) has specific roles and missions which support
operational maneuver. Those of particular interest to this study
are CAS, AI, and BAI. The U.S. definitions of these terms come
from AFM 1-1:

Close air support objectives (which) are to support
surface operations by attacking hostile targets in close
proximity to friendly surface forces. ... All preplanned
and immediate close air support missions require detailed
coordination and integration with the fire and maneuver
plans of friendly surface forces. 13,14

Air Interdiction (AI) objectives are to delay, disrupt,
divert, or destroy an enemy's military potential before it
can be brought to bear effectively against friendly
forces. 15

Battlefield air interdiction (BAI) targets are those "which are in
16
a position to have a near term effect on friendly land forces."

Allied Tactical Publication (ATP) 27(B) is in agreement
with this definition, but states even more strongly that

the objective of Offensive Air Support operations is to
directly support land force combat operations. ... During

defensive operations, BAI attacks the enemy's 2d echelon while they are still in march order configuration. 17

Air Force Manual 1-1 further points out that BAI

... requires joint coordination at the component level during planning, but once planned, battlefield air interdiction is controlled and executed by the air commander as an integral part of a total air interdiction campaign. 18

Battlefield air interdiction (BAI), a component of offensive air support, "is apportioned and planned as part of the theater air 19 interdiction effort rather than as close air support."

The primary difference between battlefield air interdiction and the remainder of the air interdiction effort is the level of interest and emphasis the land commander places on the process of identifying, selecting, and attacking certain targets. 20

Another significant component of air support is the aircraft which are capable of performing reconnaissance missions which look deep into the battlefield, past the range of the army sensors. Some of these aircraft, such as the Nimrod R1s, EC-130s, SR-71s, and RC-135s, are categorized as strategic reconnaissance 21 assets. They make a contribution to the NATO war effort, but 22 they are not under the control of NATO. Reconnaissance missions can be ordered toward either localized or specific 23 targets. Finally, tactical fusion systems are being developed to enhance NATO Command, Control, Communications, and Intelligence (C3I) interoperability. When completed, the reconnaissance information received can quickly be used within the NATO C3I 24 network by both land and air force commanders in a timely manner.

Some of the data gained from reconnaissance contributes to the counter-air missions which "are directed at aviation assets, including aircraft, airfields, command centres and support 25 facilities. They can be either offensive or defensive."

Defensive counterair (DCA) includes all actions taken to protect ground forces, and it can be either passive or active. It includes "operations to detect, identify, intercept, and destroy enemy aerospace forces that are attempting to attack friendly forces or penetrate friendly airspace." ²⁶ Offensive counter air (OCA) operations "seek out and neutralize or destroy enemy aerospace forces at a time and place of our choosing. These operations are essential to gaining aerospace superiority and providing the favorable situation which allows the Air Force to perform the other missions for which it is responsible." ²⁷ The Allied Tactical Air Forces (ATAFs) are the agencies responsible for actually ²⁸ designating offensive counterair and air interdiction targets.

Another of COMAAFCE's missions, airlift, provides the ability to move both equipment and personnel rapidly.

Airlift objectives are to deploy, employ, and sustain military forces through the medium of aerospace. ... As a combat mission, airlift projects power through airdrop, extraction, and airlanding of ground forces and supplies into combat. ... As a combat support mission, airlift provides logistics support through the transportation of personnel and equipment. ²⁹

COMAAFCE exercises operational command of subordinate air forces and maintains operational control of High Altitude Missile Air Defense (HIMAD) systems in theater. Further, COMAAFCE has operational control of all U.S. HIMAD units and is responsible for integrating their fires into the NATO Integrated Air Defense (NATINAD) system.

The distinctions between operational command and operational control are slight, but extremely important. The Joint Chiefs of Staff offer the following definitions of these two concepts. Operational command entails

Those functions of command involving the composition of subordinate forces, the assignment of tasks, the designation of objectives, and the authoritative directions necessary to accomplish the mission." 30

Operational command does not include the responsibility for administration, discipline, internal organization, and unit training. For the Department of Defense,

The term is synonymous with 'operational control' and is uniquely applied to the operational control exercised by the commanders of unified and specified commands over assigned forces ... 31

However, operational command (for NATO) is defined by JCS Pub 1 as

The authority granted to a commander to assign missions or tasks to subordinate commanders, to deploy units, to reassign forces, and to retain or delegate operational and/or tactical control as may be deemed necessary. 32

It is worth emphasizing that the NATO definition adds the authority to deploy units, which equates to the authority to position units.

Operational Control is also separately defined for NATO with an important distinction. It is

The authority delegated to a commander to direct forces assigned so that the commander may accomplish specific missions or tasks which are usually limited by function, time, or location: to deploy units concerned (emphasis added), and to retain or assign tactical control of those units. 33

It is important to note that the two definitions given for NATO include the authority to deploy units. The impact of this power given the COMAFCOE will be examined later.

The U.S. Corps in NATO

At the corps level the counterair mission focuses on control of the air environment to achieve the freedom to maneuver.

protection of reinforcement capabilities, critical assets, and reserve forces, and attrition of the threat forces in the air and on the ground.

When US Army forces are committed to combined operations, commanders are expected to adapt US Army doctrine to accommodate allied doctrine, tactics, techniques, and procedures in accordance with alliance agreements. 34

U.S. Army Short Range Air Defense (SHORAD) units assigned to corps, other US Army battlefield operating systems, and US Army HIMAD units assigned to NATO have specific roles to counter enemy air effectiveness. Air Defense Artillery is the U.S. Army's³⁵ proponent for defensive counterair. Other Army battlefield operating systems can also operate in both the offensive and defensive counterair roles. They can attack aircraft (particularly helicopters) in the air, augmenting the defensive fires of the Air Defense Artillery, or they can act offensively by attacking aircraft and their sustaining bases on the ground.

The current air defense configuration of U.S. corps in Europe does not quite match what many of the current Army manuals (e.g., FM 44-100 and FM 100-15) lead one to believe. Plans to include an ADA brigade in the corps force structure are maturing in FCRSCOM, but have not yet been included in U.S. corps stationed in NATO.³⁶ SHORAD systems in V and VII Corps in Europe are currently limited to one Chaparral/Vulcan battalion per division and organic Stinger. Plans to consolidate all Chaparral at Corps level have not yet been carried out.³⁷ There are no HIMAD (Hawk or Patriot) battalions assigned to these corps and they do not possess an ADA brigade staff. The U.S. Hawk and Patriot Air Defense battalions stationed in Germany in peacetime are assigned

to the 32d Army Air Defense Command. They are located in both the corps areas and in the rear combat zone behind the corps.

Much thought is being given to the future of corps level air defense force structure. Modernization of corps internal air defense capabilities has been accelerated since the demise of the Sergeant York air defense gun in 1985. Plans call for the fielding of a new suite of air defense systems which will provide Forward Area Air Defense Systems (FAADS) for the corps and could potentially modify the ability of the corps to protect operational forces. The latest highlights from the Air Defense Branch provide the following information on the new U.S. Army air defense systems.

The Line of Site-Forward-Heavy (LOS-F-H) system has passed its Initial Operational Test and Evaluation. ³⁸ Otherwise known as the Air Defense/Anti-Tank System (ADATS), the Martin Marietta/Oerlikon-Buhle system will be able to kill helicopters at extended ranges and has the growth potential to counter future threat developments. ³⁹ The intercept range of the system will be greater than five miles and the missile, which will travel at more than Mach 3, can reach a ceiling of 500 meters using a laser beam guidance system which is virtually immune to countermeasures. ⁴⁰

The first prototype of the line-of-site rear system, the Pedestal Mounted Stinger, was scheduled to be completed in November 1988. ⁴¹ The candidate system is the Boeing Aerospace's Avenger. ⁴² This improvement to an already proven missile system will add both air defense firepower and mobility to the corps.

Full scale development for the Non-Line of Site system was approved in August of 1989. ⁴³ This Fiber-Optic Guided Missile

(FOG-M) takes advantage of yet another new technology that will give Army air defense the capability to attack helicopters hovering at standoff ranges or behind terrain mask.⁴⁴

Additionally, a new Command, Control and Intelligence (C2I) system, which includes a new ground based sensor and masked target sensor, is being developed.⁴⁵

The FAAD C2I system will allow lateral and vertical exchange of surveillance and C2 information at all levels within the division. This system will link directly with the nearest HIMAD element to receive surveillance and C2 information from the integrated theater air defense system.⁴⁶

In October 1987, a contract was awarded for development of the software. As of this writing, competition for the sensor and radar contracts are still pending.⁴⁷

These operating systems will, according to U.S. doctrine, be under the command and control of the corps; but based on current NATO directives they must adhere to theater (NATO) airspace control restrictions. That means that they probably will not be under the operational control of COMAFAFCE, and will follow procedures similar to the U.S. SHORAD systems.⁴⁸

Another significant capability is being added to the Patriot system. Post Deployment Build I (PDB I), which was scheduled for July 1988, provides for shared electronic data between HIMAD battalions when a brigade control capability does not exist; it also allows direct integration of Hawk fire units into a Patriot battalion. PDB II, planned for January 1990, will allow the Patriot battalion automatic control center to act as the brigade "master battalion", able to control the fires of Hawk Battalions, as well as other Patriot battalions.⁴⁹

Further development and tests have been ongoing to upgrade the capabilities of both the Hawk and Patriot systems to counter the short-range ballistic missile threat. From an Army defensive counterair perspective, these are "the first steps toward building an effective defense against tactical missiles." 50

The effort has been taken to include this update on these new systems because they will have an influence on air defense available to the corps commander and to the theater air defense commander. Their impact on air element support of operational maneuver will be addressed in the next part of this paper.

The recently approved FM 44-100 further establishes that an ADA brigade will exist within each corps. Several FORSCOM ADA brigades exist and could be introduced to the European environment as REFORGER units. The presence of such a brigade in the U.S. Corps in NATO would add a dimension of air defense planning capabilities to the corps staff that does not currently exist.

Whether the corps would retain its organic Hawk or Patriot as it enters AFCENT, and how the corps ADA brigade would enter into the operational control of these HIMAD units are interesting questions. Also, whether these units possess the command, control, and communications to integrate into the NATO integrated air defense system will not be examined here, but is worthy of further study. JCS Pub 26 addresses this somewhat; that document states

Air Defense forces are normally assigned either as discrete elements of the joint force command or organic to an Army corps, MAF, or lower maneuver echelon. Forces are integrated into the local area air defense system in accordance with the established joint operational procedures and the overall air defense priorities of the joint force commander and of intermediate land force

commanders. Air defense units assigned to Army corps, MAF, or lower maneuver echelons are under operational control of the echelon commander, who employs the assigned units under the weapons control procedures and measures established by the AADC. 51

As previously stated, there are U.S. Hawk and Patriot units within the two corps sectors, but they are assigned to 32d Army Air Defense Command (32d AADCOM) and are under the operational control of COMAAAFCE. He retains the authority to reposition these U.S. HIMAD units to accomplish the missions and priorities of the defensive counterair portion of the air campaign.

Joint and Allied Staff Agencies and Procedures

Several Joint and Allied documents establish the procedures which will be followed within the NATO airspace. A review of some of the key aspects of these directives, and an understanding of the staff agencies involved with their implementation will facilitate understanding how priorities within the air element are established.

The NATO structure includes the relationships shown in figure 1. Of particular interest are the coordinating elements between the U.S. Army and Air Forces at several echelons. The planning of the air campaign is a joint responsibility of the AFDCENT and AAFCE commanders. ATP 27(B) states that

... air operations are carried out in coordination with land forces to ... assist in the attainment of ground force objectives by joint operations. 54

To determine how much of the air force effort should be dedicated to the different types of missions, a process called apportionment and allocation takes place. Apportionment is defined as:

11

the determination and assignment of the total expected effort by percentage and/or priority that should be devoted to the various air operations and/or geographic areas for a given period of time. 55

Allocation is defined as the translation of the apportionment into total numbers of sorties by aircraft type available for each operation or task. 56

The allocation/apportionment process actually begins in our area of concern when the CENTAG commander expresses his intent to COMAAFCF, and in doing so provides the air component commander with his priorities. To accomplish apportionment,

AAFCE would redistribute resources between the two ATAFs as necessary and set priorities, but might retain operational control of scarce assets or those which might need to be concentrated anywhere in the AFCENT area, ... 57

Allocation would occur as "the ATAFs would determine the number of sorties to be allocated to each of the mission categories." This allocation process occurs through the Joint Command Operations Center (JCOC), which is 58

the allied joint operations center at ATAF which allocates air resources. The Air Command Operations Center (ACOC) is the allied ACOC at ATAF/Army level. The Joint Operations Center (JOC) is the joint agency at Field Army/Tactical Air Force level when the two are collocated. The Air Support Operations Center (ASOC) is the air agency subordinate to the ACOC and collocated at the Field Army/Corps. It is an Air Force agency that may include Army. ... The ASOC specifically, advises the land commander on all aspects of offensive air support operations. 59

The Sector Operation Centers (SOC) are the ATAF agencies which have been given the responsibility for directing and monitoring radar surveillance. They also control the second-to-second action of the weapons systems, both fighter-interceptors and ground based high and medium altitude air defense missile systems. 60

Currently, the 1st AADCOM HIMAD brigades in the US

corps sectors are under the OPCON of these SOC's for control of the air battle.

Tactical Air Control Parties (TACP), are normally located at the headquarters of the ground commander. These air force representatives relay requests for air support to the Air Support⁶¹ Operations Center (ASOC). Current informal agreements indicate that Ground Air Liaison Officers will remain with the Army units they support. This holds true even when crossing Allied Tactical⁶² Air Force (ATAF) boundaries. The closest tie between the ground force and the application of air power to support ground combat is the Forward Air Controller (FAC), who may be located with the ground force or who may be airborne.

In this part of the paper, a review of the staff elements and processes which relate to NATO air element has been conducted. This review, combined with the discussion in the following portion of the paper, will form the basis for conclusions relating to the ability of the current structure to support operational planning. An examination of the basic tenets of the operational art versus the air element can now be conducted.

PART FOUR

APPLICATION OF THE OPERATIONAL ART TO THEATER AIR DEFENSE

The noted military theorist, Carl Von Clausewitz, stated that "The primary purpose of any theory is to clarify concepts and ideas that have become, as it were, confused and entangled." ⁶³ It is to that purpose that this examination of the air element and the operational art begins.

A brief review of the fundamental concepts of the operational art is in order before attempting to apply these principles to the NATO air element. "Operational art ... involves fundamental decisions about when and where to fight and whether to accept or decline battle." ⁶⁴ It is further described as "the employment of military forces to attain strategic goals through the design, organization, and execution of campaigns and major operations." ⁶⁵

Chapter 4 of the recently approved (November 1988) Final Draft of FM 44-100, U.S. Army Air Defense Operations, is devoted to the subject of "Air Defense at the Operational Level." ⁶⁶ The new manual is a quantum improvement over the previous Air Defense manual. It recognizes the concept of synchronization and states that the unity of command exercised by the Joint Force Air Component Commander (JFACC), COMAFAFCE within the AFCEM arena.

ensures that synchronization will occur. The new manual further states that

The JFC employs his counterair forces to achieve two primary operational objectives: gain control of the air environment and protect the force. 68

The Theater Army Air Defense Commander (TAADCOM) is the ADA commander at echelons above corps, who is also the Air Defense Coordinator (ADCOORD) to the Land Component Commander and the Joint Force Air Component Commander. In AFCENT, this is the 32d AADCOM commander, who "... task organizes the command ... and deploys his resources in both the combat and communications zones." 69

While it is understood that FM 44-100 is doctrinal in nature, an important difference in application occurs within NATO. In peacetime, the Theater Army Air Defense Commander (TAADCOM) in AFCENT retains the authority to position his forces. However, in wartime he does not have that authority because his units are under the operational control of COMAAFCE. Although the TAADCOM does not have wartime control of U.S. HIMAD units,

As the ADCOORD to the LCC, the TAADCOM commander is a special staff officer and participates in the GC or DCSOPS planning cell. He assists in developing Army OCA and DCA input to the air campaign plan. 70

He will have a significant influence over that plan and over the positioning of his units, as will his brigade commanders. However, many questions are not answered by this chapter of the manual.

To conceptualize the application of operational art to the NATO air element, it is helpful first to envision a setting in which this application might occur. For the purpose of this

paper, one could assume that the war that had been prevented through the long history of the NATO Alliance has finally begun. A situation which might bring the factors of the operational art to bear on the air element could be generated by problems in NORTHAG which lead to a penetration in that area. Allied plans in CENTAG could be working so well that the AFCEM commander decides to move a U.S. corps from CENTAG well into NORTHAG to achieve operational objectives. Given this scenario, is the air element within NATO ready to respond to operational thinking?

The campaign planners would have to be familiar with the structures given in the preceding chapter and would also have to consider the use of all U.S. HIMAD, including that of Time Phased Force Deployment List units, in planning the portion of the campaign pertaining to the air element. If the maneuver is to be conducted from 4ATAF to 2ATAF, perpendicular to other corps through the COMMZ, staff planning would be focused on coordination and handoff of support responsibilities as the 2ATAF/4ATAF boundary is crossed. The principal problem this would pose for the corps is the requirement to not only coordinate the handoff of air element support as the boundary is crossed, but to provide duplicative liaison personnel to staff agencies at both of the ATAFs, as described in the preceding chapter. This would be necessary to ensure requests for air support and control of Army air defense would be continuous, regardless of the ATAF an element of the corps might be in at any given time.

If the corps attacks north, in front of other engaged NATO corps, the procedural handoff appears to be much the same, with elements of the corps requesting air support from the ATAF to

their West. It seems to make more sense, however, to strengthen the momentum of the attack by maintaining the same ATAF relationships forward of the initial FLOT that existed prior to the attack, until there is an operational pause. A separate analysis would have to be conducted to determine with credibility the benefits of this approach.

The staff planner working at the operational level must now begin to apply the fundamentals of the operational art to the problems presented. It has already been determined in Part Three of this paper that adequate staff structures and planning processes and staffs exist within NATO to plan and conduct operational level planning. With an understanding of the preceeding elements and structures within the NATO environment, the staff planner must begin the analysis for the operational campaign.

Application of the Operational Art

Characteristics of the operational art include: a clear relationship of military action to the strategic end; Joint (and usually combined) actions; a dependence on tactical success; and operational planning which preceeds, accompanies, and follows tactical action. In this section the fundamental concepts which form the basis for operational thinking by the land component commander responsible for operational maneuver will be examined to determine their applicability to air campaign planning, particularly as it relates to the NATO Integrated Air Defense system.

Synchronization of the air element applies to ensuring the engagement procedures are understood by all the component forces of the NATO Integrated Air Defense system. It also includes the early warning and real-time (second by second) control of the air battle that precludes excessive engagement of single targets by multiple forces (*economy of force*) while ensuring that all targets are serviced by either the air forces or ground air defense forces.

The operational *culminating point* in the air campaign would occur when the NATO forces achieve the ability to generate air superiority at will throughout the area of operational maneuver, causing the enemy to shift from predominately offensive to defensive air operations. The objective of the first phase of the air campaign will be to gain air superiority. This will then allow the operational commander to divert a higher allocation from the defensive air mission to the objective of the second phase of the air campaign, which is normally targeted toward destruction of the remaining forces of the enemy and toward disruption of his national and alliance capabilities to sustain the war. The friendly air campaign may shift to the offensive before the ground campaign does.

Campaign planning has already been discussed; the operational air campaign must totally agree with and support the ground plan for operational maneuver. This will mean that the commanders of AFCEM and AAFCE must ensure that the forces at their disposal are assigned appropriate long term missions and that, during operations, they are correctly apportioned and allocated to maintain air superiority at key times and places.

This guidance must be built into the *operational design* of the air and land campaigns.

Branches and sequels must be included in the air campaign as well as the ground force operational campaign planning. The air campaign must address each branch and sequel of the operational ground commander's plan. It should also examine changes in the air campaign, independently from the land campaign, that may result from unplanned friendly and enemy air element strengths and weaknesses which could develop during the course of the campaign.

The operational center of gravity of the enemy's air element, the hub of all power and movement, on which everything depends, is his air element fighting forces. Defeat of his ability to generate an offensive air capability, through destruction of the aircraft, their sustaining bases, or airfields will provide the ground commander the freedom to conduct his ground campaign. "Operational maneuver is linked to identification of the center of gravity of the opposing forces." ⁷² For this operational maneuver, the enemy center of gravity includes the ground based guns and missile units and his fighter, bomber, helicopter, air reconnaissance, and tactical airlift assets which could degrade the ability of AFCEM to complete his operational plan.

The operational commander must also recognize the center of gravity of his own operation and ensure that the NATO air element places the highest of defensive priorities on its protection. The NATO air element center of gravity would be the

forces and bases used to achieve air superiority within the operational time and space.

The Jominian concepts of *interior* and *exterior lines* of operation do have a definite operational effect on the air element. If NATO or one of its regional commands is acting within interior lines, converging and thickened ground based air defense of the force will result; at the same time, the NATO air forces will be operating over a wider fan and concentration of their fires throughout the enemy's rear will be more difficult to achieve. If NATO forces are operating on exterior lines, this will have the effect of thinning the available NATO ground based air defense assets while thickening the effect of the NATO air forces on the enemy. *Logistics, lines of communications, and bases of operations* have the same importance for the air element as they do for the ground forces. Operational logistics for the NATO air forces relate to security of air bases and the lines of communications to those locations during the time an operational maneuver is being conducted. The air battle cannot be sustained unless they are protected.

The concept of *friction* will certainly be presented as communications degrade, particularly those which support automatic data links controlling the second-to-second air battle. The massive air waves expected in the CENTAG and NORTHAG regions will tax to the fullest the electronic command and control systems and the operators who are directing the air battle. Decentralized operations will be the norm, as higher controllers will have to practice control by exception while HIMAD system operators service targets as rapidly as possible. Friction will increase as

electronic counter-measures are employed by enemy aircraft in an attempt to confuse NATO radars. The tempo of the air battle will be extremely hectic and will occur in surges, taxing to the limit the endurance of both service members and their equipment.

Likewise, the fog of war will certainly be felt as confusion in the air battlefield results in degraded abilities to sort the friends from the foes. Friendly aircraft will sustain damage which will affect their navigational capability to stay within prescribed corridors and lanes; Identification, Friend or Foe (IFF) transponders will malfunction or be damaged; wounded pilots will make personal errors and drift off course. The friendly HIMAD defense systems base their engagement criteria on these factors and some fratricide is likely to result in the heat of fast-paced air battles.

Clausewitz has also stated that your enemy's power of resistance "can be expressed as the product of two inseparable factors, viz. the total means at his disposal and the strength of his will." ⁷³ Nowhere is this more true than in operations within the air element.

Operational air defense is directly related to means: NATO must be capable of massing sufficient assets at the right place and time to defeat a determined enemy. The national will of each of the NATO members is also important; an example of weakness in this important area is the lack of similarity of identification transponders on all components of the NATO air element. This is directly related to the willingness of the nations to provide ⁷⁴ funding for modernization and interoperability.

Operational warfare within the NATO air element will focus on *annihilation* of the enemy air element for a given time and space, rather than *exhaustion* (which is more commonly referred to by the NATO air element as attrition). To achieve air superiority it will be necessary to "command" the sky, in the sense the Navy gains command of the sea - the enemy must be swept entirely (annihilated) from the space and time in which superiority is desired.

Within the air element, operational genius is also an applicable concept. The technical, tactical, operational, and strategic knowledge of the senior commanders, both within the land and air element, will help them form an accurate vision of the combined battlefields. The operational intelligence gained partially from the air reconnaissance missions flown by the AAFCE, will provide the insight to form bold, unpredictable actions, integrated into all aspects of the land campaign. The generals making these decisions must apply the operational art with full knowledge of the tactical, operational, and strategic impacts of the new technology at their disposal. The NATO air component commander must possess the vision to conceptualize the air battlefield and get within the decision cycle of his enemy. He must anticipate the intent of both the enemy air element and the ground forces.

The effect of the political aim on the military objective (what political and the military means is to achieve) could influence the decision to use chemical or nuclear weapons by the NATO air element for operational purposes. It could also easily affect the allocation decisions, as assets and locations that

are critical to national support of the war are threatened. Within the NATO alliance, not all nations will have similar political aims; these aims in peacetime and the status of the national economy will cause differing levels of force structure and training. In wartime the political aim will drive the offensive or defensive nature of the nation and the economy will drive the ability of their air elements to sustain operations.

At the operational planning level within the air element, both the concepts of *offensive* and *defensive* war exist simultaneously; the AFCENT commander and COMAAFCCE accomplish both through the allocation and apportionment process, continuously balancing a defensive battle to protect the forces while striking offensively to defeat the ability of the enemy to sustain offensive operations. From an offensive standpoint

...operational fires in land operations are a relative modern phenomenon ... Today, operational fires are largely the province of theater air forces. 75

Concentration of force is imperative within the air element; it is the key to achieving operational air superiority. *Mass* within offensive air operations can defeat enemy air defenses; "corridor busting" is a technique utilized by both NATO and the Warsaw Pact; the enemy will certainly attempt to use this technique to open air corridors and to defeat operational maneuvers. Massing NATO air defenses will give the operational commander the greatest certainty that key assets or operations will be protected; however, the ability of the NATO air defenses to do this for extended space and time cannot be expected.

History is replete with examples of how the lack of understanding of technology influenced operational planning and

execution. The air element contains a striking study of a dynamically evolving set of technologies. Operational planning completed today can be radically influenced by new systems (e.g., the Stealth bomber, airborne laser systems, and passive aircraft identification devices). Not even touched upon in this paper are the significant effects arising from the development of space technology. Air campaign planning must be as equally dynamic as the changes in both NATO and enemy technology.

Deception and *surprise* apply to both air defense systems and offensive air operations. Emission control procedures deceive the enemy as to actual location of sensors and fire units. By conducting silent checks on radars (initial emplacement and periodic operational maintenance checks of the system which are performed without radiating) enemy knowledge that HIMAD systems have relocated can be electronically denied, contributing both to deception and surprise. Feints and ruses by offensive aircraft can help ensure success of offensive operational actions. Just as artillery preparatory fires can convince the enemy that an attack is planned in a particular area, so can deceptive application of air force. An air attack which matches the enemy's perception of the operational commander's intent could disguise the operational objective, while actively supporting a potential campaign branch.

Space and *time* have particular meaning to operational air defense of the force. Space affects the air defense tenets of min, mass, and mutual coverage and adds fog and friction to operational planning and execution. It requires maintenance of air defense for a large, geographically distributed force by a limited number of air element assets using strained communications systems. Time

is critical to the air element at the operational level. To achieve synchronization, the assets of the air element must be positioned both on the ground and in the air at the decisive times to accomplish operational objectives, in total coordination with the ground forces.

Thinking on operational reserves within the NATO air element deserves special comment. U.S. air defense doctrine for many years has been that Army air defense assets will not be held in reserve. This logic appears to be sound when considering support of operational maneuver. Air defense is not effective if it is not contributing immediately to gaining air superiority.

Cybernetics is an adjunct of technology. The systems within the NATO air element contain many of the most advanced man-machine interfaces of any armed force. Understanding the advantages and limitations of the cybernetics of modern warfare is another key to maximizing the effects of the air element on land and air battlefields.

Pursuit can best be applied at the operational level of the air element when considering those offensive air operations which directly contribute to pursuit conducted by the operational ground force commander. During pursuit, offensive air support will be used to disrupt the enemy rear. ⁷⁶ Offensive air operations can delay or cut off escape routes and destroy the enemy force as he retreats.

Deep operations are missions that fit well with the philosophy of offensive air operations; air bases and key logistic forces and facilities, as well as follow-on forces will be

targeted to defeat the enemy's capability to react to friendly operational maneuver.

The *decisive point* for the air element may not be directly related to geographical locations; rather, these points will be related to the specific time and space where local air superiority is required during the operation. The Jominian concept that the *objective point of maneuver* is related to the destruction of the hostile force must also be imbedded in the plans of the friendly air element. The defensive air plan must provide the ground commander the freedom to maneuver to achieve this goal. The offensive air plan can contribute to achievement of the objective point of maneuver by directly attacking those hostile forces, or by indirectly preventing the enemy from bringing sufficient force to bear at the objective point. Further, the air plan must be flexible enough to adjust to changes in the land component commander's plan brought about by *accidental lines*, which modify initial planning and cause changes (branches and sequels) to the original operational campaign plan.

Geography will influence the allocation and apportionment decisions. The air forces are not as tied to geography as are the ground based air defense systems. Geography can be used by the NATO air forces to contribute to offensive surprise. Offensive NATO aircraft can disguise their intent by approaching the enemy, whenever possible, using major terrain features (valleys and mountains) to mask their aircraft from enemy radar (this statement presumes enemy airborne early warning aircraft are not employed). The ground based systems, if used to their maximum geographical advantage, will influence operational success by allowing more of

the air force power to be applied within the decisive time and space. The same geography can be used to advantage by NATO ground based missile systems. Air defense units employed on dominant high ground, coupled with other units covering valley approaches, will contribute to denying enemy aircraft an operational advantage. Positioning of these units should be a specific concern of both the land and air force commanders. Weather and climate may affect the ability of the wheeled air defense systems to gain the high ground over degraded unimproved roads or soft pastures. Both ground based system and aircraft performance can be limited by weather; even "all-weather" systems experience clutter on radars under extremely adverse conditions. Weather, and the limitations it imposes, could be used to an operational advantage to conduct operations when the enemy air is least capable to influence the campaign.

Operational maneuver normally involves the move of large size units over great distances. U.S. SHORAD Air Defense systems provide internal air defense to some of these units, but the only ground based systems capable of providing coverage over longer distances are the HIMAD missile systems. If the operational maneuver commander gives them sufficient terrain priority so their fires reach far forward over the maneuvering force, then these systems can provide operational air defense protection.

Command, and particularly control, must be effective if the air element is to accomplish synchronization within the time and space required by the operation. Command influences the organization and planning of the air element; control ensures that synchronization occurs. Control has special meaning to the forces

of the air element, for it is through positive control that fratricide and multiple engagements of the same target are prevented.

There is another aspect of command and control in AFCENT that is of concern. In Chapter 3 it was established that the U.S. corps in the CENTAG sector do not contain ADA brigades. Assuming that one of these corps is conducting the operational maneuver in the scenario presented, how then can the corps commander gain the staff planning necessary to ensure a coordinated defense of his force by the NATO air element? One possible answer would be to attach to the corps the HIMAD brigade operating in his sector. The TRADOC draft pamphlet on Combined Arms Air Defense states that

At the operational level, the Army contributes to the theater counterair operation with a theater army ADA organization and units in a defensive role ... 77

COMAAFCCE must understand that maneuver of the ground based NATO air defenses will have a distinct influence on the success of operational maneuver. He, through operational control, retains the authority to approve movement of these forces. If the premise that the NATO air element must wage a campaign of annihilation to protect an operational maneuver is correct, then massing of the ground based defensive systems at the decisive space and time to support the operation is imperative. The author contends that the corps commander responsible for the operational move in the scenario presented would need HIMAD support immediately responsive to his priorities. This could best be accomplished through the attachment of an ADA Brigade.

One can reasonably assume that since this is an operational level of maneuver, protection of the maneuvering force is critical to campaign success and will be a high priority for air defense. Release of HIMAD assets to support the move makes sense.

COMAAFCE is responsible for air defense throughout AFCEM; if HIMAD assets are shifted North from their peacetime sector with a maneuvering corps, gaps in the old corps sector defense will result. COMAAFCE is still responsible for air defense in the vacated sector and will be required to determine how to maintain the defense with the defensive counterair assets remaining.

Future U.S. Army ADA systems and planned system upgrades will have an effect on the ability of the air element to support operational maneuver. The FAADs development will certainly give the corps commander an improved internal capability to deal with the air threat. The new systems will be more mobile and will be able to match the speed of the maneuver force. Their improved firepower, accuracy, and lethality will have a marked effect on local defensive counterair operations and will provide the corps commander with immediate response to his local priorities for air defense. The full implementation of the ADA brigade structure within the corps will provide the corps commander with a significant improvement in air defense staff planning capabilities. Integration of operational planning and execution with the ATAFs and their Sector Operations Centers will be facilitated by this addition. Improvements giving the Hawk and Patriot systems the capability to pass automatic data link

directly will add flexibility to the air defense battlefield. This will facilitate the movement of HIMAD units from one sector to another without a degradation in command and control of the air battle and the shared air picture will provide early warning.

This analysis of the basic tenets of the operational art and their applicability to the NATO air element has not presented any significant problems with the current staff structures and processes discussed in Part Three. It appears that the NATO structure can incorporate operational level planning without major modifications.

The terms and concepts used by the operational land component commander have been used throughout this analysis in direct relation to the air campaign. It is clear that the basic tenets of the operational art apply equally well to both the air and land campaign.

PART FIVE

CONCLUSIONS

History has proven the value of integrated operational AirLand campaign planning. Using the results of history to develop military theory and insight into the effects of the air element on operational maneuver is valuable, but must be tempered with a thorough understanding of the significant technological developments which have modified the modern air battlefield.

After examining these elements of operational planning it is apparent that the only U.S. Army Air Defense assets capable of having a true operational effect on operational maneuver are the HIMAD systems. The U.S. Army air defense assets which can influence operational maneuver are the Hawk and Patriot systems. Given the low number of systems in relation to the sizeable force to be supported, operational prioritization of air support and air defense is imperative.

Joint and NATO doctrine provide adequate guidance for integrating planning of the air element in support of operational maneuver. Staff processes and agencies within NATO also appear to be capable of such support. The melding of the air element into operational maneuver is the joint responsibility of the operational commander of land forces and his air component

counterpart; they must ensure the air campaign complements the land campaign.

Can the staff agencies and procedures in NATO support the operational concepts presented above? It appears that they can. The review of operational concepts just presented can be incorporated in the higher levels of campaign planning within the current staff structures. None of the concepts presented appear to clash violently with U.S., Joint, or NATO doctrine. However, the handoff of air control/support responsibilities between the maneuvering corps and the ATAFs as air boundaries are crossed should be a critical staff planning concern.

Can the same operational tenets used by the land commanders be used to plan the air campaign? This analysis says yes. It appears that the operational thinking that is applicable to the land campaign works well in developing the basic premises upon which the air campaign will be based. The actual development of the air campaign plan is not within the scope of this paper, but would be the logical extension of the preceding discussion. The requirement to integrate air element thinking into the operational plan from the outset should be obvious.

The primary concern resulting from this analysis is over the authority of the corps commander to direct the movement of HIMAD units. It is imperative that U.S. HIMAD units be positioned not only to support Allied operational maneuver, but to also provide maximum collateral coverage to US units. Even this will not be a problem if the Army Group commanders influence the ATAFs and AAFCE to apply the tenets of operational warfare to the air campaign.

Certainly, coordination between nations will always be a challenge; we face a particular set of problems in dealing with strong-willed allies who possess national strategies which do not always align with ours. Achievement of true operational thinking within the NATO air element structure is not so much a problem of staff procedures or staff elements as it is one of education of the leaders of these staffs.

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37 Again, this statement is based on my personal observations which were correct as of June 1988.

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