

MISSION-TYPE ORDERS IN JOINT AIR OPERATIONS

The Empowerment of Air Leadership

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Abstract

The Air Force's current doctrinal maxims of centralized control and decentralized execution have the potential to produce overcentralized planning at the theater air operations center (AOC); the result of this tendency is a cumbersome air tasking order (ATO) and a campaign vulnerable to lost communications, information overload, and decapitation. One cure for such problem is the decentralization of tactical planning through the use of mission-type orders at the wing or air task-force level. Mission-type orders include a clear statement of the superior commander's intent and state each unit's tasks in terms of operational effects to be achieved in several days rather than daily targets and aimpoints.

A related problem exists in the horizontal command relationships at the theater level. During Operation Desert Storm, there was friction between some ground commanders and the joint forces air component commander (JFACC) about the issue of air interdiction targeting. When the theater CINC insisted that ground commanders pick air targets and then micromanaged the targeting himself, without providing feedback to these commanders, they frequently blamed the JFACC and his staff for ignoring their targeting nominations. To reassert their influence, they supported the formation of a joint targeting board that had the potential to degrade the JFACC's control of his air interdiction assets. An alternative to such a system is the use of mission-type requests from the ground commander to the air commander couched in terms of desired operational effects over a discrete period of time.

This study seeks to answer the question, "If a joint force air commander finds it useful or necessary to operate at the theater level and one level below with mission-type orders or requests, what are the preconditions that must exist in order to make such a partially decentralized command system work?" To answer this question, the study examines theoretical perspectives on command and control, including those of Napoléon, the Germans, the Israelis, and former fighter pilot John R. Boyd. Following this theoretical survey, the study analyzes two historical case studies that exhibited both the use and nonuse of mission-type orders and requests in order to draw conclusions regarding the necessary preconditions in the categories of leadership, organization, communications technology, and procedure. These studies are Gen George C. Kenney's air campaign in the Southwest Pacific during World War II and Operation Desert Storm.

The study concludes that the preconditions for successful employment of mission-type orders and requests include mutual trust running up, down, and across the chain of command; the willingness to accept risk and uncertainty; the periodic statement of intent and tasks; distributed intelligence; effective communications among low-level units; a robust body of common doctrine; composite units; and the decentralization of targeting expertise. Finally, the study suggests several implications of these conclusions for today's Air Force.

About the Author

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Chapter 1

Introduction

After Germany's defeat in World War II, many historians and military leaders studied the German command system in an attempt to explain its stunning early campaign successes. One of these analysts, Col Trevor N. Dupuy, US Army, Retired, argued that most German units outperformed their allied foes in several measures of combat effectiveness.¹ Dupuy concluded that the secret of the German army's operational and tactical prowess lay in its long general staff tradition which "institutionalized military excellence" in the German officer corps through careful selection and years of military education and training.² A key component of the general staff tradition was a decentralized command and control philosophy based on the clear statement of the senior commander's objectives and the assignment of broadly stated tasks to subordinate commanders in order to accomplish the objectives. Rather than prescribing how the task was to be accomplished, senior commanders expected subordinate commanders to exercise their own talent and initiative in planning and executing a course of action within the spirit of the senior's intent.³

The postwar interviews and the memoirs of generals such as Erich von Manstein supported this thesis; and several German generals used the term *auftragstaktik* to describe this method of command and control that relied on general guidance from above combined with low-level initiative.⁴ Although the term *auftragstaktik* was not used extensively in German literature, a number of English-speaking military analysts seized on it as a key ingredient of successful command which they translated as "mission-type orders" or "mission order tactics." It is now a popular, though at times misunderstood, word in contemporary literature on the art of command.⁵ In 1982 the United States Army formally embraced its own interpretation of mission order command and control as a key element of its new AirLand Battle doctrine.⁶ This style of decentralized planning and decision making was seen as the best way to operate on the high-tempo modern battlefield with its rapidly changing combat conditions and the likelihood of disrupted communications. Though the Army's implementation of *auftragstaktik* has been far from ideal, this command and control concept has many Army advocates.⁷

Definition

What is a mission-type order? The Joint Chiefs of Staff defines it as an order issued to a lower unit that includes the accomplishment of the total

mission assigned to the higher headquarters, or one that assigns a broad mission (as opposed to a detailed task), without specifying how it is to be accomplished.⁸ In the 1930s the Air Corps Tactical School taught future commanders to use two types of such orders: mission instructions and field orders. Mission instructions were issued to subordinate commanders before an air operation and periodically thereafter to communicate the plans of the theater-level commanders, including the overall air mission, operational air objectives, time constraints, and the part each major unit was to play in the operation. The school stressed that subordinate commanders must be kept informed of their superior's intent over longer periods of time than could be covered in day-to-day field orders in order to deal with changing situations or lack of detailed guidance.⁹

Field orders were issued more frequently and came in two varieties depending on the situation: detailed orders and mission orders. Detailed orders assigned a specific task and included precise execution instructions. Mission orders were more general in the nature of the task and included the general plan of action and the task of each subordinate unit only in enough detail to ensure coordination. A mission order assigned the necessary resources to accomplish the mission and left the planning and execution methods to the subordinate commander. The school recognized no clear line between the two and taught that the level of guidance in any field order depended upon several factors, such as trust, experience, unit training, and the intelligence available to the subordinate.¹⁰

For purposes of this paper, a mission-type order communicates the superior commander's general intention and directs the subordinate commander to achieve a desired operational effect in support of that intention over a period of several days. Essential elements of the order or request are who, what, when, and why, but not how. An example of a desired effect would be, "Delay the lead element of the 20th Serbian Tank Regiment for 48 hours." A mission-type request, however, is not directive in nature and comes from a lateral command level; for instance, from a ground component commander to an air component commander. Both mission-type orders and requests require the air commander to determine the detailed air tasks necessary to accomplish the broader mission.

Given the above definition, this paper seeks to determine the necessary conditions for air commanders at the air component level and one level below to work successfully with mission-type orders and requests. Specifically, if air commanders find it useful or necessary to exercise a type of air *auftragstaktik* in lieu of more detailed daily guidance, this paper will attempt to ascertain the leadership, organizational, technical, and procedural conditions that are required to make this command style effective.

Contemporary Significance

In the 1980s the United States Air Forces in Europe examined the difficulty of centrally controlling daily combat flying operations during Soviet

attack on the NATO command and control infrastructure. As a countermeasure, the directorate charged to find a solution to the problem recommended the issue of mission-type orders to combat wings and daily “tasking by exception” as long as communications channels remained open. In this way, even if communications were disrupted with one or more wings, the air component commander would know what missions those wings would perform autonomously so he could plan the rest of the flying operation around them.¹¹

In 1990, as commander in chief, Pacific Air Forces, Gen Merrill A. McPeak questioned the ability of air component command staffs to plan detailed daily air missions in the form of a lengthy air tasking order (ATO) in the face of rapidly changing combat conditions, information overload, and interrupted communications. General McPeak proposed the employment of composite wings equipped for independent combat operations and stated that air component commanders should task their subordinate wing commanders with mission-type orders to reduce the daily information flow at the headquarters and to preempt the threat of lost communications.¹²

A criticism of Desert Storm air operations concerned the daily ATO that Gen Charles Horner, the joint forces air component commander (JFACC), used to orchestrate the Coalition flying operation. The ATO often ran up to 800 pages and required a compatible computer system, the computer aided force management system (CAFMS) at each wing to receive it electronically.¹³ For wings that lacked this system, such as the carrier air wings, the ATO had to be delivered by air courier. Due to its three-day planning cycle, the ATO was faulted for its poor timeliness and its frequent tendency to change on the day of execution when preplanned targets became irrelevant.¹⁴ Such detailed central planning required a large staff, a tremendous number of intelligence inputs and continuous reporting from flying wings regarding unit readiness and aircraft availability. This centralization of detailed planning and intelligence at the tactical air control center (TACC) made the entire operation vulnerable to communications failure, information overload, or decapitation. The United States Gulf War Airpower Study (GWAPS) stated, “If [CAFMS] was disabled or shut down for even a short period of time—a few hours—it would have been impossible for the ATO to be distributed throughout the theater within an acceptable period of time.”¹⁵

Fortunately, the Iraqis did not attack the Coalition command and control system during Desert Storm. However, the current Air Force system remains a vulnerable target for a future adversary and a potential means for the enemy to get inside the joint commander’s “decision loop.”¹⁶ As McPeak said after the war, “We don’t really know whether the command structure was tough enough, durable enough, to survive really difficult combat conditions.”¹⁷

At the theater level, as the Army began to embrace the concept of mission-type orders in the 1980s, Gen John Galvin, then the VII Corps commander and later the supreme allied commander, Europe, recommended a new approach to NATO battlefield air interdiction (BAI) targeting procedures. First, Galvin urged land force commanders to communicate their

battle plans and the role of airpower operations within those plans more effectively to the air component commander. Then he urged the use of mission-type orders (or requests) for air interdiction support rather than submission of detailed corps target lists for Air Force “servicing.” Acknowledging that air commanders were in the best position to determine what targets airpower should hit to support the overall theater campaign, Galvin said,

The corps commander needs battlefield air interdiction that has as its main purpose the attack of follow-on forces to disrupt them and attrite them as they approach the close-in battle area. The best way to achieve this is to carry out BAI the same way we accomplish other battlefield tasks: with mission-type orders. The air commander should be given a mission, not a series of targets.¹⁸

Lt Gen John H. Cushman also addressed this issue in his book, *Thoughts for Joint Commanders*, when he said,

The land formation commander may well, and usually should, define the specific effect to be achieved. But there can be only one answer as to who defines the target itself—the airman. No one else has the combination of technical and operational expertise required to decide the details of what to do and how to do it. The joint commander is seeking the application of air *auftragstaktik* in which (1) he and his senior airman are on exactly the same wavelength as to his intent, not simply for the use of air but for the battle as a whole, and (2) his senior airman is in harmony with the other commanders of his force. . . . His JFACC can then use his initiative toward the common aim.¹⁹

Furthermore, current joint interdiction doctrine states that, “operational-level objectives are best described in terms of desired outcomes rather than specific targets.”²⁰ In addition, it states that the planning and coordination cycle for interdiction should emphasize mission-type orders where appropriate to ensure the continuance of effective operations during periods of degraded communications.²¹

Despite the success of air operations during Desert Storm, there has been criticism of the air interdiction support given to army corps commanders.²² At the component level, the interdiction controversy centered around the army’s influence on interdiction target selection. With the blessing of Gen H. Norman Schwarzkopf, the joint force commander, the corps commanders insisted on nominating individual interdiction targets. Many of these targets, however, conflicted with the theater commander’s broader priorities; and the corps target cells often lacked the reconnaissance capability to locate many of them accurately, especially the moving targets. In addition, battle damage assessment problems and outdated target databases at times led the corps to nominate targets that had already been struck.²³

Nevertheless, General Horner sorted through these inputs and prioritized the target nominations in accordance with General Schwarzkopf’s guidance and their suitability to air attack. He then assigned them to individual fighter wings via the daily ATO. Corps dissatisfaction with Horner’s “servicing” of their targets caused an outcry and the formation of a low-level joint targeting board to take the heat off Horner and arbitrate target priorities among the

corps commanders. This “targeting by committee” approach was an unsatisfactory solution for both sides.²⁴ The formation of a joint targeting board had the potential to dilute the JFACC’s control over air interdiction assets, and the political battles are still raging over the control of interdiction targeting.

If one accepts the argument that mission-type orders and requests may be a viable option for the joint force commander and the JFACC to resolve the issues outlined above, it would then be useful to discover the conditions at the component command and subordinate levels that are required for such decentralized planning and execution to work. That discovery constitutes the central burden of this study.

Methodology

This paper will first examine the command and control theories of the Germans and contemporary writers and theorists influenced by them such as Martin van Creveld and John R. Boyd. From this theoretical discussion, the analysis develops several hypotheses concerning conditions in the categories of leadership, organization, technical equipment, and procedures that are necessary for mission order command to work.

Following this discussion of command theory, the paper examines two historical airpower case studies in order to obtain evidence about the hypothetical conditions. The first case, Gen George C. Kenney’s World War II command of the Fifth Air Force in the Southwest Pacific, was chosen to show airpower relevance to this command concept. The second case is Desert Storm, which demonstrated both the use and nonuse of mission-type orders and requests. In each case the main issues will be first, to determine the extent to which the commanders used mission-type orders and second, to analyze the conditions categorized above that made mission order command and control possible. Evidence from the two cases will be synthesized to draw conclusions regarding general conditions for mission-type orders. The study ends with suggestions regarding the contemporary and future implications of these findings.

Notes

1. Col Trevor N. Dupuy, *A Genius for War* (Fairfax, Va.: Hero Books, 1984), 4.
2. *Ibid.*, 5.
3. Daniel J. Hughes, “The Abuses of German Military History,” *Military Review*, December 1986, 67.
4. Dupuy, 116.
5. Hughes, 68.
6. Army Field Manual (FM) 100-5, *Operations*, 1986, 21.
7. Maj John T. Nelsen II, “Where To Go From Here?: Considerations for the Formal Adoption of Auftragstaktik by the U.S. Army” (Fort Leavenworth, Kans.: School of Advanced Military Studies, 1987), 31. Also see Maj David M. Cowan, “Auftragstaktik: How Low Can You Go?” (Fort Leavenworth, Kans.: School of Advanced Military Studies, 1986), and Maj John M.

Vermillion, "Tactical Implications of the Adoption of Auftragstaktik for Command and Control on the AirLand Battlefield" (Fort Leavenworth, Kans.: School of Advanced Military Studies, 1985).

8. JCS Pub 1-02, Department of Defense Dictionary of Military and Associated Terms, 1 December 1989, 236.

9. Air Corps Tactical School, Combat Orders Course, 1938. US Air Force Historical Agency (hereafter USAFHRA) file no. 248.40018-1.

10. Ibid.

11. DALFA Project 4-81 (S), Directorate of Air Land Forces Application, Ramstein AB, Germany, 1981. Information extracted is unclassified.

12. Gen Merrill A. McPeak, "For the Composite Wing," *Airpower Journal*, Fall 1990, 4-12.

13. Gen Michael Dugan, "The Air War," *US News & World Report*, 11 February 1991, 28.

14. James A. Winnefeld and Dana J. Johnson, *Joint Air Operations: Pursuit of Unity in Command and Control, 1942-1991* (Annapolis, Md.: Naval Institute Press, 1993), 110.

15. United States Gulf War Airpower Survey (GWAPS), vol. 1, Planning and Command and Control (Washington, D.C.: Government Printing Office, 1993), 6-26. (Secret) Information extracted is unclassified.

16. The "decision loop" refers to Col John R. Boyd's command and control concept of the observe-orient-decide-act (OODA) decision cycle. See chapter 2 of this thesis for a detailed description.

17. "USAF Chief Pans War's Command Chain," *Defense Week*, 2 December 1991, 1.

18. Message, Commander VII Corps to Commander USAREUR. Subject: Joint Force Development Initiative 21, Battlefield Air Interdiction, 251530Z October 1984, as cited by Col Robert W. Peterman, "Mission-Type Orders: An Employment Concept for the Future" (Maxwell AFB, Ala.: Air War College, 1990), 19.

19. Lt Gen John H. Cushman, *Thoughts for Joint Commanders* (Annapolis, Md.: John H. Cushman, 1993), 37-38.

20. JCS Test Publication 3-03, *Doctrine for Joint Interdiction Operations*, 1990, 5-2.

21. Ibid.

22. Gen Frederick Franks, former VII Corps commander, interview (tape recorded) with Maj P. Mason Carpenter, Maxwell AFB, Alabama, 23 March 1994. Also see Brig Gen Robert H. Scales, Jr., *Certain Victory: The US Army in the Gulf War* (Washington, D.C.: Department of the Army, 1993), 178.

23. Scales, 181.

24. Ibid.

Chapter 2

Theoretical Perspectives on Command and Control

In *Command in War*, Martin van Creveld traces the evolution of military command from the days of Alexander the Great to the present. He defines command as a function that has to be exercised, more or less continuously, if a military force is to operate effectively.¹ This function, he argues, consists of six basic subtasks that have remained relatively constant over the years: (1) the timely collection of accurate information; (2) the distinguishing of the relevant information; (3) the translation of the information into an estimate of the situation; (4) the establishment of objectives and the selection of an appropriate course of action; (5) the issuing of clear orders to subordinate commanders; and (6) the monitoring of their execution so as to accomplish the mission without unduly interfering with the authority and initiative of subordinates.²

To carry out these tasks the commander must select the organizational, technical, and procedural means with which to construct an effective command system. However, as the great military theorist Carl von Clausewitz maintained, the basic problem confronting the commander in the construction of his command system and the execution of his tasks is dealing with uncertainty. Clausewitz described chance and uncertainty as essential elements of the climate of war, saying, "War is the realm of chance. . . . Chance makes everything more uncertain and interferes with the whole course of events."³

One of the functions of command most affected by chance and uncertainty is the gathering of information and the sorting of the true from the false. Clausewitz said,

Since all information and assumptions are open to doubt, and with chance at work everywhere, the commander continually finds that things are not as he expected. . . . Usually, of course, new information and reevaluation are not enough to make us give up our intentions: they only call them into question. We now know more, but this makes us more, not less uncertain.⁴

According to Clausewitz, the ability to deal successfully with such uncertainty was an element of military genius.⁵

Van Creveld argues that there are two ways for a commander to deal with uncertainty: centralization or decentralization. When choosing a course of action with insufficient knowledge of the situation, the commander can either increase his information-gathering capacity, and thus the complexity of his

organization, or he can divide his mission into parts and reorganize his forces to accomplish those parts on a semi-independent basis.⁶ Van Creveld asserts that the latter is the better option despite the capacity of modern communications systems and computers to handle the increased information flow required by the first option. Computers, he argues, are subject to failure; and communications systems are vulnerable to jamming or destruction of key nodes.⁷

In making this case, van Creveld analyzed the organizational, technical, and procedural aspects of command as practiced by Alexander, the Romans, Napoléon, the Prussians, and the Israelis. He concluded that the success of their respective command systems depended upon their willingness to sacrifice certainty at the highest command levels, in the form of strict centralized control, for the freedom of action and initiative of subordinate commanders.

For example, the Greeks commanded their forces by organizing thousands of men into giant phalanxes that were relatively inflexible and controlled with simple acoustic signals. The overall commander communicated his intelligence and battle plan beforehand due to the poor battlefield communications; and once the battle started, the subordinate formation commanders were on their own.⁸ Similarly, the Romans organized into legions and smaller self-contained subunits, each with its own commander and capable of independent and mutually supporting action. These units were imbued with a common tactical doctrine and equipped with a bugler to sound standardized battle orders. Before battle, they too were apprised of the situation and the intent of the commander in chief in order to provide a common outlook and focus of main effort. Thereafter, in most cases, the actions of subordinate commanders relied on individual initiative and did not depend on orders from the highest levels.⁹

Napoléon

According to van Creveld, the secret of Napoléon's success, beyond his own genius, was the organization of his army into independent corps and divisions. Each of these was a self-contained "composite" force of infantry, artillery, and cavalry. In addition, each corps and division commander had his own combat-experienced staff to assist in tactical planning. Tactically, these units were capable of fighting on their own without detailed daily guidance. However, historian David G. Chandler paints a much different picture of Napoléon's command and control method at the operational level.

Chandler asserts Napoléon's centralization of operational planning in a single person was at once his greatest strength and his greatest weakness. His general staff existed only as a conduit for his detailed orders and as his formal intelligence channel from the field. On the general staff, "There was no call for originality of thought or effort. Napoléon decided all, planned all, and controlled all."¹⁰ His command system was the antithesis of mission order command. Napoléon did not share his strategic and operational intentions

with his subordinates; and he discouraged original thought in his generals.¹¹ He preferred instead to keep his commanders guessing as to what his next operational move might be, and they were expected to respond instantly to his constant orders.

Chandler argues that the trademark of Napoléon's operational method was the dispersion of independent corps in a "web of carefully positioned forces" while approaching the enemy, followed by an orchestrated concentration at a weak point and a rapid exploitation to encircle and annihilate the enemy.¹² His engagements were planned in great detail in order to reduce the effects of chance and uncertainty; and every conceivable situation was covered in a branch of the plan. The self-contained corps allowed a higher speed of march, ease of foraging, and deception regarding his force size. However, there was no room for operational initiative on the part of his subordinate commanders; and his system was totally dependent on good communications with his headquarters. In the end, Napoléon's inability to control his forces at Leipzig and Waterloo revealed the inherent weakness in his centralized command system. Lacking timely instruction and a clear understanding of his intent, Napoléon's subordinate commanders were ill-prepared to analyze the battlefield situation and take coordinated independent action.

The Israelis

Van Creveld labels the command system employed by Moshe Dayan in the 1956 Arab-Israeli War as "optional control." This system was born of necessity due to inadequate communications equipment. It required low-level independence and initiative. Dayan organized independent units for each major task and issued them mission-type orders. He reserved the "option" to interfere with a subordinate commander only when he felt it absolutely necessary. However, as van Creveld points out, Dayan failed to stay in adequate touch with the combat situation and issue further guidance once the war started; and poor communications between operational units hampered their low-level coordination efforts.¹³ These problems were overcome during the 1967 war in which the cornerstone of Israeli optional command remained "maintenance of aim" in accordance with the commander's intent and independent action to maintain speed in the armored advance. Detailed planning was left to the division commanders who were allocated a certain proportion of direct air support sorties; and the air force was issued mission-type orders to provide theater interdiction support.¹⁴

Van Creveld concludes that the success of such mission-oriented command and control over the years depended on four key factors: (1) low-level freedom of action and initiative; (2) self-contained units organized for independent operations; (3) a regular reporting and information system up and down the chain of command; and (4) the use of informal information-gathering methods by the headquarters outside formal reporting channels.¹⁵ In a word, van Creveld equates these factors to the essence of German *auftragstaktik*.

The Germans

Ironically, Hessian soldiers, who observed the success of decentralized command and independent action during the American Revolution, first carried the concept to Germany.¹⁶ Though German soldiers were not the first military men to use mission order command, they adopted it as the cornerstone of their operational doctrine and married it to modern communications technology to form what Trevor N. Dupuy calls the most effective fighting force in modern times.¹⁷ Armies the world over attempted to imitate their methods of operational command and employment before and after the Second World War; and German command theory remains a strong influence on American army doctrine.¹⁸

It is important to note that the German system was more than a command and control technique: it was a basic philosophy of war that permeated all aspects of German military leadership, education, training, and employment. The command and control philosophy that the World War II generals referred to as *auftragstaktik* was originally a response to the force dispersal prevalent in the nineteenth century that the Germans called “the empty battlefield.”¹⁹ This dispersal, a protective response to firepower innovations, significantly reduced the ability of senior commanders at the front to observe and control their forces. Therefore, Helmuth von Moltke, the chief of the General Staff, trained his officers and men to take bold individual action without relying on a constant stream of orders from their superiors. Moltke’s purpose was to speed decision making and sustain the tempo of his operations despite battlefield communications difficulties and ever-changing situations. In effect he wanted to stay inside the enemy’s “decision loop.”

The essential ingredient of his command and control concept was the use of mission-type orders. Such orders required a clear expression of the senior commander’s intent which today we equate with his “mission,” or the overall effect he hoped to achieve. The next ingredient was the assignment of the subordinate commander’s task (*auftrag*) which he was to perform within the framework of the senior commander’s intent. The senior’s order thus stated where, when, and why the subordinate was to accomplish the task but did not dictate how to accomplish it. The purpose of the order had primacy over the task.²⁰ In addition, the senior commander provided the necessary resources to accomplish the task, stated any operational restraints, and provided coordinating instructions with other units as required.²¹ Such tasks were usually fairly broad and long term in scope as recounted after World War II by Field Marshal Erich von Manstein:

It has always been the forte of German military leadership that it relies on commanders at all levels to show initiative and willingness to accept responsibility and does everything in his power to promote such qualities. That is why, as a matter of principle, the “directives” of higher commands and the orders of medium and lower commands always contained so-called “assignments” for subordinates. The detailed execution of these assignments was the business of the subordinate commanders concerned. Only when there was no other possible alternative did

anyone on our side encroach on the authority of a subordinate headquarters by specifically laying down the action it should take.²²

Not only was initiative expected without the receipt of orders but the subordinate was expected to disregard the task if the combat situation required it and to act upon his initiative to take advantage of the new situation within the framework of the senior's intent.²³ To illustrate this point Moltke told the story of a Prussian major who was reprimanded for a tactical mistake by Prince Frederick Charles. When the major replied that he was simply following the king's orders, the prince reminded him, "His Majesty made you a major because he believed you would know when not to obey his orders!"²⁴ The Germans wanted "thinking" leaders at every level who were competent and equipped with the intellectual tools to act decisively despite the uncertainty of incomplete or conflicting information. A primary reason for this philosophy was Moltke's conviction that, "No operational plan extends with any certainty beyond the first encounter with the main body of the enemy."²⁵ Moltke had a great appreciation for the "fog" and "friction" that permeate the realm of war. He clearly met Clausewitz's standard that, "the good general must know friction in order to overcome it whenever possible, and in order not to expect a standard of achievement in his operations which this very friction makes impossible."²⁶

Richard Simpkin, the noted air-mechanized theorist of the late twentieth century, perfectly described the human basis for *auftragstaktik* as "a supple chain of mutual trust and respect running downwards and upwards without interruption through all levels of command."²⁷ The foundation of this essential trust was the senior-subordinate relationship in which the senior commander's greatest responsibility was the development of proper leadership characteristics and operational outlook in his subordinate commanders.²⁸

To equip his combat commanders with the requisite intellectual tools Moltke created an elite general staff supported by a military education and training system that singled out the most highly qualified young officers and trained them as experts in theory, doctrine, operational planning, and tactical employment. This general staff system represented "the institutionalization of military excellence."²⁹ After graduating from the *Kriegsakademie*, these officers were eligible for command above the regimental level; and Moltke rotated them to the field as commanders or chiefs of staff who could offer expert operational advice.

These general staff officers were infused with a common understanding of German operational doctrine and tactical technique, giving them a "common cultural bias."³⁰ War games were a favorite German method for development of this common outlook and for fostering trust among senior and subordinate officers. Through war games, senior commanders could "get to know" their subordinate commanders' strengths and weaknesses and train them to make quick decisions and take initiative.³¹ Officers were taught to be innovative in the solution of tactical problems rather than conform to a "school solution."³² In fact the Germans never adopted a list of "principles" of war because they

believed successful command was a creative art based on a foundation of knowledge rather than a systematic application of rigid principles.³³

Because the German military leaders recognized that each combat situation was unique, junior officers were taught how to think about tactical problems rather than what to think.³⁴ During tactical exercises, senior officers often gave incomplete or conflicting guidance; and they expected their subordinates to make intuitive decisions and take rapid action based on the situation and the senior's intent. The Germans taught their officers to accept responsibility and risk by taking bold action rather than waiting for more perfect information.

Through this education and training, junior officers learned to overcome their apprehension about decision making and risk because mistakes were expected and accepted as learning tools by senior commanders.³⁵ Moltke considered inaction in combat as criminal, so German officers were taught that, "In war, omission and delay are greater crimes than the choice of wrong method of action; prompt decision and prompt action are vital at all times."³⁶ As a result of such training and leadership development, the Germans achieved the common operational outlook, reliability of action, and mutual trust that made *auftragstaktik* work. After World War I the German army codified Moltke's Prussian concepts in its 1933 edition of the *Truppenführung*, or "troop leading" field manual, and these concepts formed the underpinning for *blitzkrieg* warfare that depended on speed and rapid exploitation of enemy weaknesses.³⁷

John R. Boyd

Popular military theorist and former fighter pilot John Boyd cites the German system as an example of "organic" command and control that relied not upon technical means to facilitate command but rather on leadership and the implicit bonds of a common operational outlook. Boyd refers to this common outlook among seniors and subordinates as their "orientation" that allows decentralization while retaining unity of effort in an uncertain and changing environment. According to Boyd, such a common orientation serves to reduce friction in war and prevents command system paralysis or collapse.³⁸

The centerpiece of Boyd's theory of command and control is the "O-O-D-A loop," which defines the decision cycles of two opposing forces. This decision cycle has four phases called observation, orientation, decision, and action that an adversary must go through to react to a changing situation. Boyd's theory is that the key to victory is the ability to operate at a faster tempo than the adversary to disrupt his appreciation of the changing situation and induce confusion, fear, and paralysis.³⁹ Of the four phases, orientation is the most critical because it determines the way one observes, decides, and acts.⁴⁰

According to Boyd, the traditional functions of command and control, which emphasize top-down compellence and regulation, inhibit the implicit ability of men to deal with change and uncertainty using their own initiative. He

argues that leadership, which gives unambiguous direction on what is to be done, and appreciation, which determines what is being done but does not interfere, should replace traditional command and control.⁴¹ Furthermore, he argues that if commanders and subordinates have the same implicit orientation, they can overcome the effects of friction, adapt to changing situations, maintain unity of effort, and operate “inside the enemy’s decision loop” without constant top-down guidance. Thus, one can see the connection between Boyd’s “OODA loop” and the German philosophy of *auftragstaktik*.

Using the German example, Boyd concentrates on two primary concepts: mission and *schwerpunkt*. Boyd describes mission as a contract in which the subordinate agrees to do what is necessary within the framework of the commander’s intent while the superior agrees to give the subordinate freedom of action in how to fulfill the intent.⁴² *Schwerpunkt*, on the other hand, acts as the focus of main effort or “harmonizing agent” which helps coordinate the efforts of many subordinates as a collective group. This serves as the interface between leadership guidance flowing down the chain of command and low-level initiative flowing up.⁴³ This equates to our current definition of the objective and the Israeli concept of “maintenance of aim.” Thus, Boyd argues, common understanding of the *schwerpunkt* allows decentralization without destroying cohesion and unity of effort.

Boyd asserts the objective of *blitzkrieg* was to seize the initiative and sustain an operational tempo faster than the enemy’s in order to exploit enemy weaknesses and disrupt his ability to operate.⁴⁴ To seize and maintain the initiative the Germans relied on the technical support of aerial reconnaissance and a mobile communications system that included a radio in every tank. Aerial reconnaissance helped build the “big picture” of enemy concentrations and weaknesses while the series of interconnected radio nets allowed the panzer leaders to develop the picture further and share it with one another while moving independently to the enemy’s weak points. This distributed tactical picture, combined with understanding of the main effort and commander’s intent, contributed to each leader’s “orientation” to enhance small unit initiative. In addition, this radio net allowed the senior commander to communicate a change in the *schwerpunkt*, or main effort, and commit reserves at the proper place.⁴⁵

Boyd stresses that the keys to successful *blitzkrieg* were (1) the implicit bonds based on a common outlook; (2) definition of the *schwerpunkt* to focus the efforts of many units; (3) trust among seniors and subordinates; (4) freedom of action for subordinates; (5) intelligence to provide a common picture of the situation; and (6) communications to maintain cohesion among units and allow the senior leadership to redirect the main effort.⁴⁶

Summary

In theory the advantages of mission order command are many. It establishes a common aim and states the commander’s overall intent while giving subordinate commanders the freedom of action to do what is necessary

depending on the tactical situation. This, in turn, allows field commanders to make independent decisions and take quick action to exploit changing combat situations without waiting for guidance from above. The ultimate aim of this type of command and control is to wage war faster than the enemy, despite the fog and friction of war, and drive him to a state of paralysis or collapse.

This theoretical analysis appears to indicate that there are certain leadership, organizational, technical, and procedural conditions that enable a relatively decentralized command and control system to function successfully. In the leadership category the conditions appear to be trust in subordinate commanders, willingness to delegate authority, uniformity of thinking, and operational competence. In the organizational category the necessary condition appears to be self-contained units capable of independent action without the support and coordination of other units. In the technical category this method requires distributed intelligence and communications among the smallest units to maintain orientation and feedback on mission success. Finally, in the procedural category it requires identification of commander's intent and focus of main effort down to the unit level, as well as deconfliction among units in time or space.

With these hypotheses in mind, this paper turns now to two historical case studies of air operations first to pinpoint the use of mission-type orders and then to draw conclusions regarding the conditions that enabled their use.

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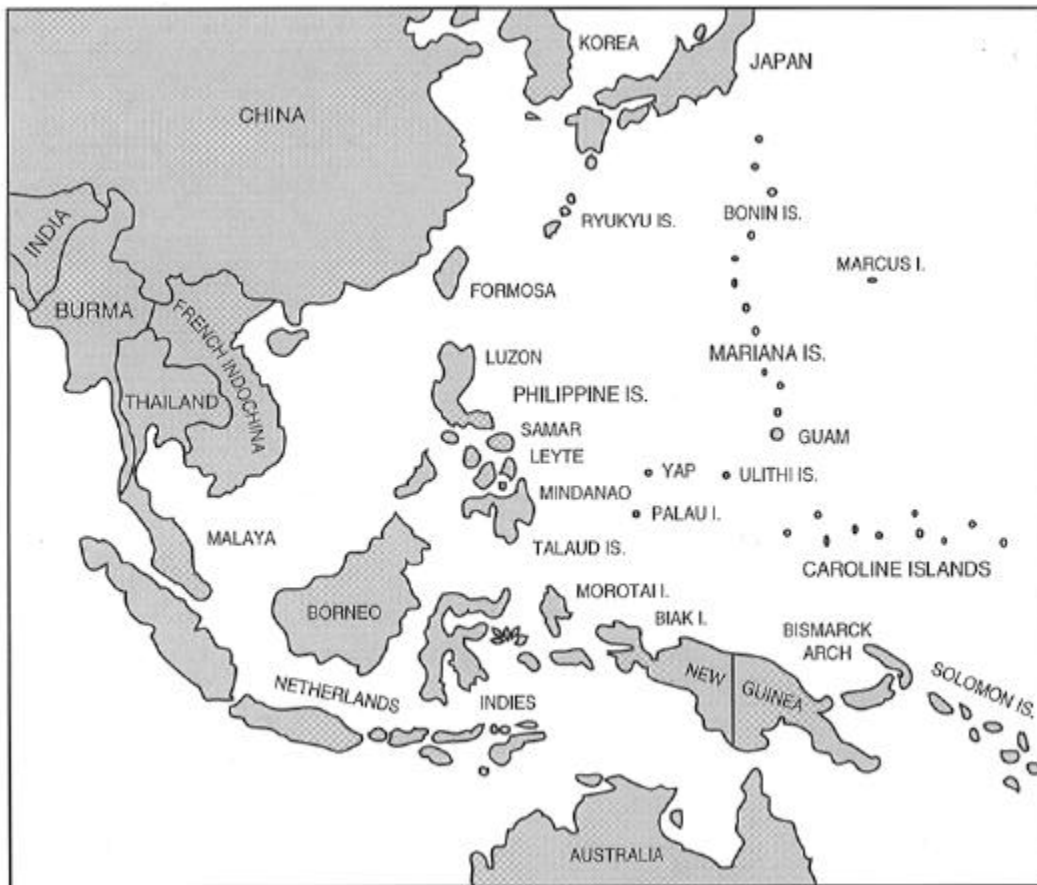
Chapter 3

Mission Order Command in the Southwest Pacific

As an example of air auftragstaktik, no air campaign stands out like Gen George C. Kenney's in the Southwest Pacific during World War II. A master innovator, Kenney was given free rein to employ airpower as he saw fit by his joint force commander Gen Douglas MacArthur.¹ Kenney exercised centralized control of his forces to focus the main airpower effort as required by the evolving situation. At the same time, he delegated authority and responsibility for detailed planning and execution to his subordinate commanders, sometimes down to the group level, to provide them the flexibility to respond to changing tactical realities.

The war in the Southwest Pacific consisted of four major phases: the isolation of the Japanese stronghold at Rabaul; preparation for the assault on the Philippines; the occupation of the Philippines and the cutting of the Japanese lifeline to the Southwest; and the preparation for the final assault on Japan.² This analysis of Kenney's command focuses primarily on the first two phases, which include the defense of Port Moresby and the subsequent offensive operations to capture air bases along the north coast of New Guinea en route to the Philippine Islands. During these phases of the campaign, Kenney's forces grew from a handful of American and Australian flying groups to an aerial armada that included two numbered air forces as well as the Royal Australian Air Force (RAAF), the joint navy and marine task force called Aircraft Northern Solomons (AIRNORSOLS), and occasionally air elements of the US Seventh Fleet.

When Kenney assumed command of the Allied Air Forces, Southwest Pacific Area in August 1942, the air situation was bleak and MacArthur was disappointed with the performance of his air forces.³ The combined American and Australian air force was in disrepair and had been unable to turn back the Japanese landing at Buna, New Guinea. Japanese aircraft flying from Rabaul, New Britain, protected Japanese shipments of men and supplies while denying Allied air superiority over New Guinea. Meanwhile, Japanese ground forces were driving across the Owen Stanley mountains toward Port Moresby, the Allied foothold on the south coast. Kenney's first mission was to gain control of the air to interdict the Japanese supply shipments and support the ground forces defending Port Moresby.⁴



Source: Benjamin Franklin Cooling, ed., *Case Studies in the Development of Close Air Support* (Washington, D.C.: Office of Air Force History, 1990), 296.

Figure 1. Southwest Pacific Area

Command Relations

Kenney's greatest asset was the autonomy MacArthur gave him to control air operations. His predecessor, Lt Gen George H. Brett, had not been so fortunate; and once MacArthur's staff lost faith in Brett's leadership, it took over the details of daily air tasking. Kenney would not accept such detailed supervision and quickly asserted his control over air operations.⁵ He impressed MacArthur immediately with his willingness to assume responsibility, his pledge of loyalty, and his confidence that he could turn the air force into an effective fighting machine.⁶ MacArthur trusted Kenney; and that trust grew stronger with every air force combat success. MacArthur's staff stopped issuing daily air operations orders and limited its guidance to broad mission-type orders before each major operation, leaving the detailed planning and control to Kenney and his subordinates.⁷

Kenney also enjoyed productive professional relationships with MacArthur's other major commanders, including Gen Thomas Blamey of the

Australian army, Lt Gen Walter Krueger, commander of the American Sixth Army, Maj Gen Robert Eichelberger, commander of I Corps, and Adm Dan Barby, the Seventh Fleet amphibious commander. These commanders, in turn, understood the need to defeat the enemy air force and isolate the landing beaches through the interdiction of Japanese reinforcements and supplies before successful amphibious operations could take place. After completing these essential tasks, Kenney pledged close air support and the airlift of troops and supplies to support their operations directly.⁸ Kenney delivered on his promises and earned the trust of these commanders, who did not interfere with the control of the air forces.⁹ They left the interdiction targeting to the air forces, and the army limited its air requests to close air support.¹⁰

Kenney bestowed the same degree of trust upon his subordinate commanders, especially his deputy, Brig Gen Ennis Whitehead.¹¹ Kenney had known "Whitey" for over 20 years and respected his "brains, leadership, and loyalty."¹² Whitehead also had MacArthur's confidence, and he was a long-time friend of Eichelberger's.¹³ After taking over in 1942, Kenney sent Whitehead forward to Port Moresby and delegated the control of day-to-day flying operations to him. Kenney remained in Brisbane to focus on logistics and confer with MacArthur and the Australians on theater strategy.

Kenney had a similar faith in Brigadier Generals Kenneth Walker, who commanded his bomber command, and Paul B. Wurtsmith, who commanded his fighter command. Kenney had known Walker for nearly 20 years and admired his tactical competence and work ethic. His only reservation was the latter's reluctance to delegate authority.¹⁴ Wurtsmith earned an excellent reputation as commander of the 49th Fighter Group, and he impressed Kenney immediately with his combat leadership and loyalty to his men.¹⁵ Once these new commanders were in place, there was a chain of trust and respect that ran laterally among the component commanders and vertically from General MacArthur to the tactical flying commanders.

Organization, Planning, and Control

One of General Kenney's first administrative priorities was the reorganization of the Allied Air Forces. He separated the Australians and Americans, creating the American Fifth Air Force separate from the RAAF. Kenney wore two hats in Brisbane as commander of the Allied Air Forces and the Fifth Air Force, while General Whitehead became commander of the Advanced Echelon (ADVON), Fifth Air Force in Port Moresby. Kenney gave Whitehead the necessary intelligence and operations staff to handle operational-level planning. All of Fifth Air Force came under Whitehead's operational control, as did elements of the RAAF when Kenney so directed.¹⁶

When Whitehead assumed command of his small force in New Guinea, his staff planned the details of most combat missions. However, he issued mission-type orders to his group commanders and supplemented them with daily taskings. For instance, he ordered the 19th Bombardment Group to

destroy enemy convoys approaching New Guinea, ordered the third attack group to attack enemy airdromes on New Guinea, and ordered the new provisional fighter command to protect allied installations on New Guinea and assist the bomb groups by escorting the bombers and strafing enemy airfields.¹⁷ As his forces grew in strength, Whitehead often decentralized the detailed operational control to the fighter and bomber commands and RAAF operational groups. Kenney gave these commands adequate staff to decide how best to handle their assigned groups on a day-to-day basis; and they responded to directives from Whitehead as well as requests from the ground forces.¹⁸ Whitehead distributed the bomber command's reconnaissance photos among the commands as required. Walker's headquarters was initially at Darwin on the north coast of Australia while Wurtsmith's was colocated with Whitehead's at Port Moresby. During the advance through New Guinea and the Philippines, these headquarters moved several times, but usually remained well behind the most advanced air echelons.

At first, Fifth Air Force had only a handful of flyable fighter and bomber groups along with a modest airlift capability. Due to Kenney's successful appeals to Washington, however, heavy bomber groups and P-38 fighters began arriving slowly in 1943 to bolster his force. Kenney's groups each had three homogeneous squadrons. Kenney picked capable colonels and lieutenant colonels to be group commanders and insisted they personally lead their forces in combat operations.¹⁹ The groups had small intelligence and operations staffs sufficient for their tactical-level planning.

Operational planning began in Brisbane where Kenney established the focus of main air effort in conjunction with MacArthur's guidance and Eichelberger's scheme of maneuver. Kenney then divided the operational responsibilities of the Australians and the Fifth Air Force and issued mission-type directives to Whitehead and the Australian air commander, Air Vice-Marshal W. D. Bostock.²⁰ Whitehead and Bostock in turn issued periodic mission-type directives to their subordinate commands: the fighter and bomber commands and the Australian composite operational groups.²¹ Kenney often placed Bostock's composite groups under Whitehead's control or vice versa as the air situation dictated.²²

Kenney's official operating instructions and Whitehead's official reports were complemented by a constant stream of personal letters. Kenney's frequent letters elaborated his operational intent; they also reveal the trust Kenney had in Whitehead's ability and the freedom of action Whitehead enjoyed.²³ In turn, Whitehead's instructions to his wing commanders reveal a similar professional trust.²⁴

Whitehead issued mission-type operating instructions to the fighter and bomber commands that covered periods of several days, usually supplemented by a daily field order. The operating instructions outlined the general situation, Kenney's intent (the effect he wanted to achieve), and the specific missions of the subordinate commands. These instructions were typically two or three pages long.²⁵ Such general missions included air support for amphibious operations and attacks on shipping and airfields in particular

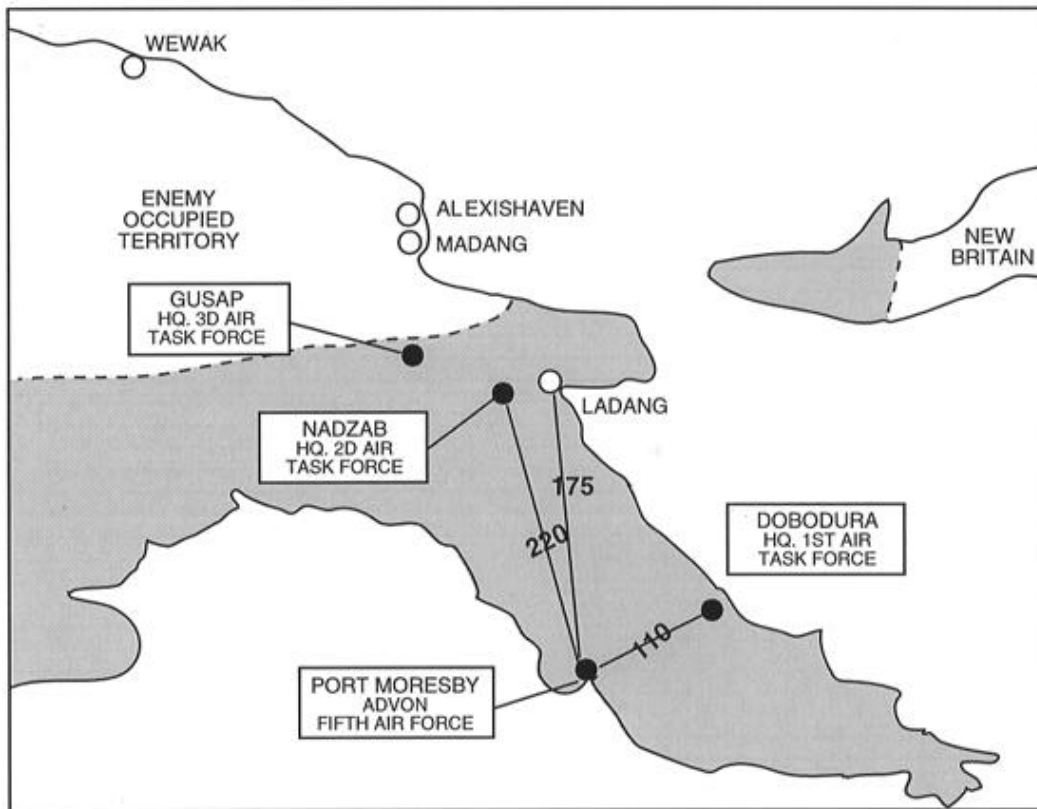
sectors over a period of days. The detailed targeting was often left to the fighter and bomber commands and sometimes to group commands.²⁶ These echelons then issued more detailed daily fragmentary field orders to the flying units. Whitehead's orders were typically one or two pages long; the level of detail in the orders varied with the mission.²⁷

Special missions that required a high degree of coordination and timing with other components or adjacent theater forces required more detail. However, missions such as night bombing and reconnaissance beyond fighter range required less coordination. For daylight bombing missions, Whitehead directed the fighter command to provide the necessary support. It was often up to the fighter and bomber commands to work out details such as aircraft type, time on target, weapons, fuzing, and the number of supporting fighters.²⁸

After the Allies pushed the Japanese back to Buna, they built several airfields nearby at Dobodura. Kenney then created a new combat organization that became the prototype for the rest of his Southwest Pacific campaign: the air task force. Once the Allied Air Forces gained this foothold on the northern New Guinea coast, Kenney decided it was impractical for Whitehead to continue giving detailed operational guidance from Port Moresby. Communications between Port Moresby and the northern coast were often unreliable due to the mountains, so Kenney structured his air task forces to be able to operate independently if necessary.²⁹ Kenney's approach to his overall mission was to divide it up into major objectives, each of which would be assigned to a major force organization.³⁰ The First Air Task Force, commanded by Kenney's trusted former chief of staff, Col Freddie Smith, was such an organization.

The air task force was a purely offensive formation, and Whitehead gave the task force commander operational control over all designated units. Task forces varied in size from a couple of squadrons to several groups according to the objective at hand. Task force flying units might come from the fighter and bomber commands, the troop carrier wing, the reconnaissance wing, the Australians, the marines, or the navy. Because the War Department never recognized Kenney's task forces as official organizations with their own table of allowances, Kenney was forced to staff them with men from Whitehead's headquarters as well as the fighter and bomber commands. During task force operations, the parent commands retained administrative control over the units and provided the necessary logistics support.

General Kenney used the First Air Task Force, commanded by Colonel Smith, to attack the main Japanese air bases at Rabaul and to support the amphibious assaults on Gloucester and Arawe on the island of New Britain. Like all subsequently formed air task forces, Smith's was composite in nature, comprised initially of the 49th Fighter Group and a squadron of the third attack group. Whitehead provided the intelligence and planning staff necessary for Smith to take over the detailed control of his force. The composite structure of these forces obviated the need for centralized force packaging at Whitehead's level. In addition, the planning staffs usually included army and navy liaison officers to help integrate navy and marine



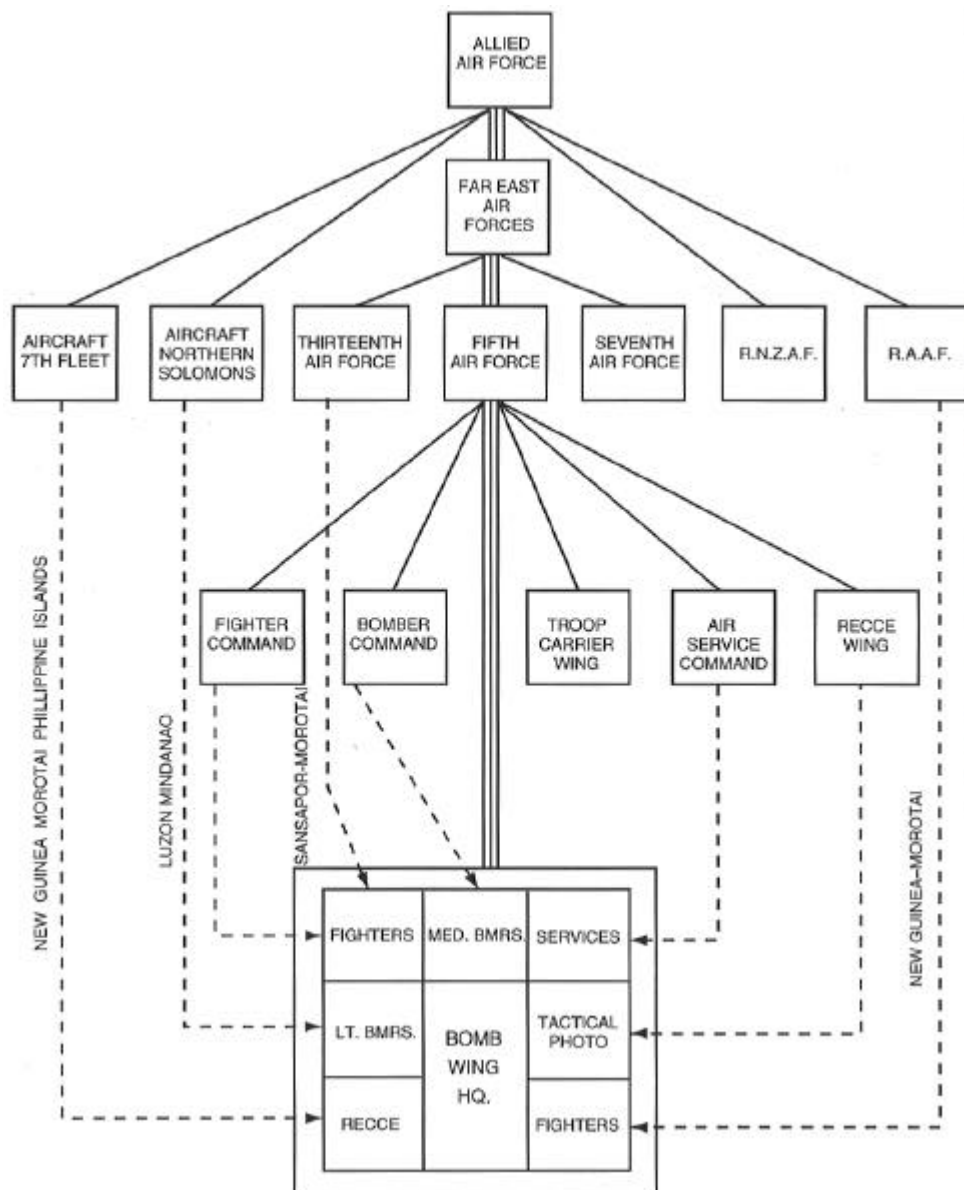
Source: *United States Strategic Bombing Survey, Pacific War*, vol. 71, *The Fifth Air Force in the War against Japan* (Washington, D.C.: War Department Military Analysis Division, 1947), 9.

Figure 2. New Guinea Air Task Forces, 1943

units into the air task forces and to coordinate the air effort with that of the corresponding ground and naval task forces.³¹ Whitehead then integrated the missions of the task forces with those of the fighter and bomber commands. By October 1943 Whitehead had three air task forces established in Eastern New Guinea.

Kenney's later air task forces were built around a core command, usually a bomber wing, complete with a permanent operational planning staff. They were complemented by a shifting kaleidoscope of supporting Air Force, Navy, and Marine air units. Kenney and Whitehead exercised centralized control by assigning units, missions, and areas of responsibility to the air task forces, but let the task force commanders, either colonels or brigadier generals, handle the detailed operational planning. As Kenney's forces grew and the Southwest Pacific campaign progressed from New Guinea through the Philippines, Kenney combined more groups to form large wings. Three of these wings, the 308th, 309th, and 310th bombardment wings, became the core units of the three primary task forces within Fifth Air Force.³² After the

attainment of each major objective, Kenney frequently dissolved the air task forces. Operational control of their attached groups then reverted to the parent organizations such as the fighter and bomber commands, but the staff normally stayed with the bomb wing.³³ Kenney and Whitehead constantly rebuilt these task forces with different operational units as each new objective demanded.



Source: *United States Strategic Bombing Survey, Pacific War*, vol. 71, *The Fifth Air Force in the War against Japan* (Washington, D.C.: War Department Military Analysis Division, 1947), 10.

Figure 3. Air Task Force Structure

Whitehead also gave mission orders to group commanders for short periods of time. For example, he designated the 348th Fighter Group as a subtask force of the 310th Bomb Wing and gave its commander, Colonel Rawlins, a mission order for a week to support a division of the Sixth Army approaching Biak.³⁴ This allowed Rawlins to control the operational pace of his unit.³⁵ Whitehead did not view such mission order assignments as violations of centralized command as these units maintained their independence from ground command and could be retasked as necessary.³⁶ To provide timely response to CAS requests, Whitehead directed the group headquarters to maintain direct communications with the ground division.

By 1944 Fifth Air Force Fighter Command formed two air defense fighter wings, the 85th and 86th, each of which had its own headquarters squadron and signal company.³⁷ Their primary mission was defense of the airfields and air sectors along the New Guinea coast and among the Philippine Islands. Whitehead delegated operational control to these wings, which were stationed on Wakde, Cape Sansapor, and Leyte Island, issuing them standing mission orders for air defense and fighter sweep within their areas of responsibility.³⁸ Each wing and wing detachment owned air defense radars and a sector control center. Fifth Air Force designated which groups or squadrons were tasked for air defense, but the wing commanders had authority to scramble aircraft and draw upon the aircraft of adjoining sectors as necessary.³⁹

In June 1944 Kenney became commander of the Far East Air Forces and he absorbed the Thirteenth Air Force and the First Marine Air Wing from the South Pacific theater. Whitehead became commander of the Fifth Air Force and Maj Gen St. Clair Streett commanded the Thirteenth Air Force. Kenney continued to give general guidance to these commanders and allowed them great freedom to make operational decisions, encouraging them to collaborate and merely keep him informed.⁴⁰

Operation GLOBETROTTER—the capture of Cape Sansapor in Western New Guinea as a prelude to the assault on the Philippines—is illustrative of the integration of the composite bomb wings and the primary air task force in support of amphibious assaults. Excerpts from General Whitehead's operating instructions to his three wing commanders illustrate his typical division of labor and mission-type operational guidance.

Commanding Officer, 308th Bomb Wing will:

- (1) Carry out necessary reccos as required.
- (2) Provide fighter cover for defense of BIAK and NOEMFOOR.
- (3) Provide fighter cover for friendly naval shipping as required.
- (4) Attack targets in GREELVINK BAY and VOGELKOP areas per plan of Commanding Officer, 308th Bomb Wing.
- (5) Utilize maximum B-24s for strikes on PERELIRU ISLAND.

Commanding Officer, 309th Bomb Wing will:

- (1) Attack personnel and supplies in WEWAK-BUT-BORAM area per plan of Commanding Officer.

Commanding Officer, 310th Bomb Wing will:

- (1) Provide local cover of HOLLANDIA and WAKDE.
- (2) Support friendly ground forces as required per plan of Commanding Officer.
- (3) Provide fighter cover for troop carriers to OWI ISLAND as required.
- (4) Conduct night missions to VOGELKOP area using available night fighters.
- (5) Release one group B-25's to control of the 308th Bomb Wing.⁴¹

This field order instructed the Fifth Bomber Command to provide squadrons to the three composite wing (air task force) commanders and instructed the 54th Troop Carrier Wing to place six squadrons of C-47s under



Source: Gen George C. Kenney, *General Kenney Reports* (Washington, D.C.: Office of Air Force History, 1987), 410.

Figure 4. 13th Air Task Force: Operation Globetrotter

the operational control of the 310th Bomb Wing. Once equipped with the right mix of forces, these bomb wing commanders had great latitude to conduct operations within Whitehead's guidance and the requirements of the amphibious forces.

General Kenney designated the 13th Air Task Force, under Brig Gen Earl Barnes, as the lead force to assume control in the Sansapor area. Barnes and his headquarters staff went ashore with the army and supervised the army's construction of airfields. Once the controllers ashore established communications and got their mobile radars operational, they assumed control of flying operations in support of the ground forces from the shipborne air controllers. When the bases were ready, Barnes called his squadrons forward and took over all flying operations in the forward area. Acting under Whitehead's mission orders, Barnes attacked Japanese air bases, shipping, and oil refineries in the Dutch islands southwest of Sansapor. His task force flew more than 2,100 sorties before Whitehead dissolved it in October, at which time his units fell back under the operational control of Thirteenth Air Force.⁴²

As the many air forces operating in the Southwest Pacific Area converged on the same targets and target areas in the Philippines, coordination became more difficult. In a message to all numbered air forces, bomb wings, Australian operational groups, and bomber commands, Kenney directed each of these major striking forces to circulate its daily "air intent" to the other forces, including its major strike and reconnaissance missions.⁴³ To aid coordination between land-based aircraft and the carrier aircraft of the Third Fleet, MacArthur divided the airspace around the Philippines into air task areas.⁴⁴ Kenney assigned separate areas to the Australians and the Fifth and Thirteenth Air Forces. However, he centrally controlled the support relationships between these units and reassigned groups among them in accordance with his identification of the "main effort."

Intelligence and Communications

Intelligence and communications were essential to the decentralization of air planning and execution at the bomber command, fighter command, air task force, and wing level.⁴⁵ Each echelon had some organic reconnaissance capability for mission planning purposes and for timely feedback on mission success. Reconnaissance products were also forwarded to Fifth Air Force ADVON and redistributed as necessary. Air defense wings "owned" their own radars and sector control facilities. Decryptions of intercepted Japanese communications were disseminated down to the fighter command, bomber command, and air task force level.⁴⁶

During the series of amphibious assaults en route to the Philippines, communication was critical between Kenney's fighter control elements at sea, the covering fighters (sometimes naval), alert fighters, and the ground forces. During assault landings, the shipborne air controllers handed fighters off to ground-based air support parties who controlled the close air support fighters.

The shipborne controllers also vectored their covering fighters to intercept incoming enemy aircraft. The fighter wing control detachments went ashore with the first assault troops and quickly set up their mobile air defense radars and established communications with the ground, air, and naval task forces. Once these shore-based wing controllers established communications, they assumed tactical control of all air task force aircraft.

While air task forces could operate independently for days without direction from Fifth Air Force, internal communications within the fighter, bomber, and airlift groups was essential. These task forces were often dispersed among different airfields; therefore, the timely response to air defense and ground support tasks required low-level communications among units and with the air support parties on the ground.⁴⁷ Whitehead demanded rapid establishment of communications between the supporting elements of Fifth Air Force and with the other services during joint operations. Distressed after the slow set up of air defense communications during one early operation, he fought successfully for the attachment of an army signal communications company to each air task force.⁴⁸

Results

The Allied Air Forces made a vital contribution to the campaign in New Guinea and the reoccupation of the Philippines. The joint use of carrier and land-based airpower paved the way for a series of amphibious assaults which in turn captured more airfields from which to launch the next wave of air attacks. The central role of airpower was evident in MacArthur's summary of Kenney's qualities as an operational air commander, "Of all the commanders of our major Air Forces engaged in World War II, none surpassed General Kenney in those three great essentials of successful combat leadership: aggressive vision, mastery over air strategy and tactics, and the ability to exact the maximum in fighting qualities from both men and equipment."⁴⁹

Analysis of Leadership

Kenney's leadership style enabled mission-order command and control to function down to the air task force and sometimes to the group level. At the component level Kenney's operational competence, willingness to assume responsibility, and the close personal relationship he cultivated with MacArthur resulted in a harmonious bond of trust between the theater commander and his senior airman. Kenney also earned the trust of his fellow component commanders by delivering on his promises of air superiority and ground support. He was also willing to dedicate air units to support specific ground forces for periods of time as the situation dictated. As a result, neither MacArthur nor the ground force commanders tried to control the employment of the Allied Air Forces. This trust and cooperation extended to the navy as well; and Kenney's air task forces were frequently given operational control of land-based naval and Marine air units.

This chain of trust also extended to Kenney's subordinates. He empowered his air commanders to the lowest practical level. He picked competent combat commanders whom he trusted and turned them loose under his general guidance. Even after Kenney moved his headquarters forward from Australia, he continued to delegate detailed operational planning to Whitehead. Whitehead, in turn, demonstrated these same qualities and allowed the fighter commander, bomber commander, and air task force (wing) commanders to conduct operations as they saw fit. He issued periodic mission-type orders to these commanders and only tasked them for detailed special missions by exception. Kenney communicated his intent and the current focus of main effort (schwerpunkt) and Whitehead ensured that it was transmitted two levels down the chain of command. Japanese shipping in the Bismarck Sea and airfields around Rabaul were typical schwerpunkte, though this foreign terminology was never used.

Though he delegated authority readily, Kenney did not divorce himself from operational command responsibilities. He remained completely engaged in the operations of his units and on occasion dictated tactics such as low-level skip bombing despite the reservations of his bomber commander. He conducted tests to determine the optimum fuze settings for parafrag bombs, and he used strategic bombers such as the B-17 to perform airlift and reconnaissance missions that ran counter to existing air force precepts. He had tremendous personal initiative and he expected the same quality in his subordinates.

Army commanders shared their schemes of maneuver by dispatching officers to the air commanders charged with close air support. Air group commanders, in turn, often dispatched pilots to the front lines to become familiar with the ground situation and offer suggestions for the use of airpower. This gesture also enhanced the army's faith in the air force. By 1944 the use of dedicated air support parties was a standard procedure that ensured effective air-ground cooperation.

By sharing operational planning responsibilities with the task forces, fighter commands, and bomber commands, Kenney and Whitehead let those who were closest to the operational problems help determine the detailed airpower solutions. Whitehead also gave mission-type orders to proven group commanders on occasion for missions, such as ground support, air defense, night bombing, and photoreconnaissance that required no force packaging. Kenney and Whitehead spent much of their time determining the major airpower tasks and the best mix of resources required to carry them out. They then empowered their subordinate commanders by placing those resources under their operational control as long as necessary in order to accomplish each task.

Analysis of Organization

The use of self-contained air task forces allowed semiautonomous operations for specific air tasks within constantly shifting areas of responsibility. Kenney

used the decentralization technique described by van Creveld when he divided his overall mission into discrete operational tasks, such as air support for a particular assault or “mopping up” operations against isolated ground forces and formed the necessary composite units for each major task. The composite Australian operational air groups functioned as additional air task forces. Each of these self-contained forces usually included reconnaissance and signal communications units to ensure that they could maintain orientation on the combat situation within their area of responsibility and operate without detailed daily guidance from Fifth Air Force. The US Strategic Bombing Survey noted that these air task forces “greatly reduced communications and staff orders.”⁵⁰ Rather than centralize the airlift assets of the 54th Troop Carrier Wing in the interest of efficiency, Kenney decentralized them by assigning airlift squadrons to task forces in the interest of combat effectiveness.⁵¹

Analysis of Technical Requirements

Communications at the lowest levels allowed decentralized planning and execution when task forces operated beyond radio range of the numbered air force headquarters. Air support parties on the ground, shipborne air controllers, air defense wings, groups, and air task forces were tied together in a comprehensive radio network made possible by technical improvements such as VHF radios in aircraft and jeeps. The inclusion of signal communications units in each air task force ensured rapid connectivity among the subunits of these forces. Though land lines to the Fifth Air Force ADVON were frequently interrupted, this connectivity among task force units ensured that the operational momentum continued. The theaterwide communications network allowed the air task forces, RAAF groups, and the bomber commands to circulate their “air intents” among themselves to aid coordination once they concentrated against the same target groups in the Philippines.

Photographic intelligence at the air task force level helped the task force, fighter, and bomber command staffs determine the force size, aimpoints, and weapons required for strike missions. In addition, the organic reconnaissance capability gave the task force commander timely feedback on battle damage which allowed quick restrikes if necessary. The dissemination of decrypted Japanese communications also allowed Kenney’s commanders to respond to fleeting opportunities with special strike missions.

Analysis of Procedures

Three procedural conditions aided the use of mission-type orders in the Southwest Pacific: the frequent communication of missions and commander’s intent, the establishment of standard operating procedures, and the deconflition of forces in time and space. Generals Kenney and Whitehead issued mission-type operating instructions nearly every week to communicate command intent, the focus of main effort, and the broad missions of every major air unit so that it knew where it fit in to the overall plan. Both generals

supplemented these formal orders with informal letters which elaborated their operational intent to their subordinates. Kenney and Whitehead corresponded almost daily, and Whitehead often wrote letters to his air task force commanders expressing his operational concerns and his confidence in them. The development of Fifth Air Force standard operating procedures for such tasks as amphibious landing support, close air support, and air defense helped reduce the friction inherent in creating multiple ad hoc air task forces from disparate units.

Areas of responsibility did not prevent the massing of airpower when required but did offer an easy way to ensure safe separation of forces if poor communications limited greater coordination. Within the Southwest Pacific theater, Kenney and the naval task force commanders jointly developed aerial reconnaissance and air defense sectors while ground and air forces adopted a standard aerial grid system for ground target designation. Kenney maintained the safe separation of his forces with the navy by limiting them to night attacks when both services were required to strike the same target areas with little opportunity for coordination.

In summary, Kenney's creation of air task forces and delegation of operational authority to the lowest practical level were born of necessity by the unreliability of communications with advanced bases on New Guinea. However, the willingness to delegate authority also seems to be an integral element of Kenney's air leadership that fostered the development of his subordinate air commanders. In addition to good leadership, Kenney's wing commanders needed adequate forces, staff manning, intelligence, and communications to operate on a semiautonomous basis. The division of labor into missions and geographic responsibilities, along with standard operating procedures, enabled Kenney's forces to operate effectively without an overwhelming amount of control and guidance from the top. Finally, Kenney's competence earned the trust and cooperation of his fellow component commanders who resolved not to interfere with his control of the air forces.

The next case study, Desert Storm, provides a contemporary example of a composite air task force executing mission-type orders. At the theater level, however, established targeting procedures, coupled with a lack of command harmony, sparked controversy over the control of air targeting.

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Chapter 4

Mission Order Command in Operation Desert Storm: Its Presence and Absence

In 1990 when Coalition forces deployed to the Persian Gulf in response to Iraq's invasion of Kuwait, Gen H. Norman Schwarzkopf, commander in chief (CINC) of the United States Central Command (USCENTCOM) designated Lt Gen Charles A. "Chuck" Horner, commander of Central Command Air Forces (CENTAF), as the theater joint forces air component commander (JFACC). Horner's initial mission was simple: defend Saudi Arabia from Iraqi invasion. Soon, however, Col John A. Warden III and his Air Staff planners in the basement of the Pentagon began developing a strategic air offensive designed to neutralize Iraq's leadership and war-making capability. Warden's plan was the only offensive option available to Schwarzkopf pending the buildup of his ground forces, so he seized upon it and turned it over to Horner and his staff in Riyadh who expanded and refined the plan during the months preceding the war.¹

The air offensive had six operational objectives: the destruction of Iraq's capability to wage war by neutralizing its leadership and command and control; the gaining of air superiority; the cutoff of Iraq's supply lines; the destruction of Iraq's nuclear, biological, and chemical capabilities; the destruction of the Republican Guard forces; and the liberation of Kuwait. The plan consisted of four phases, some of which ran concurrently: a strategic air campaign against Iraqi centers of gravity; operations to gain air supremacy; preparation of the battlefield in Kuwait; and the support of ground offensive operations.²

Command Relations

As the JFACC, Horner was responsible for "planning, coordination, allocation and tasking based on the joint force commander's apportionment decision."³ Responsibility for coordinating the air effort did not, however, include operational control of non-CENTAF air forces. The Marine Air-Ground Task Force (MAGTAF) commander retained operational control and tasking authority of Marine aircraft dedicated to battlefield preparation and direct support of Marine ground forces. Horner's control of Marine air was limited to air defense and interdiction sorties that the MAGTAF made available to him.⁴ The Navy retained a similar degree of control over fleet defense sorties.

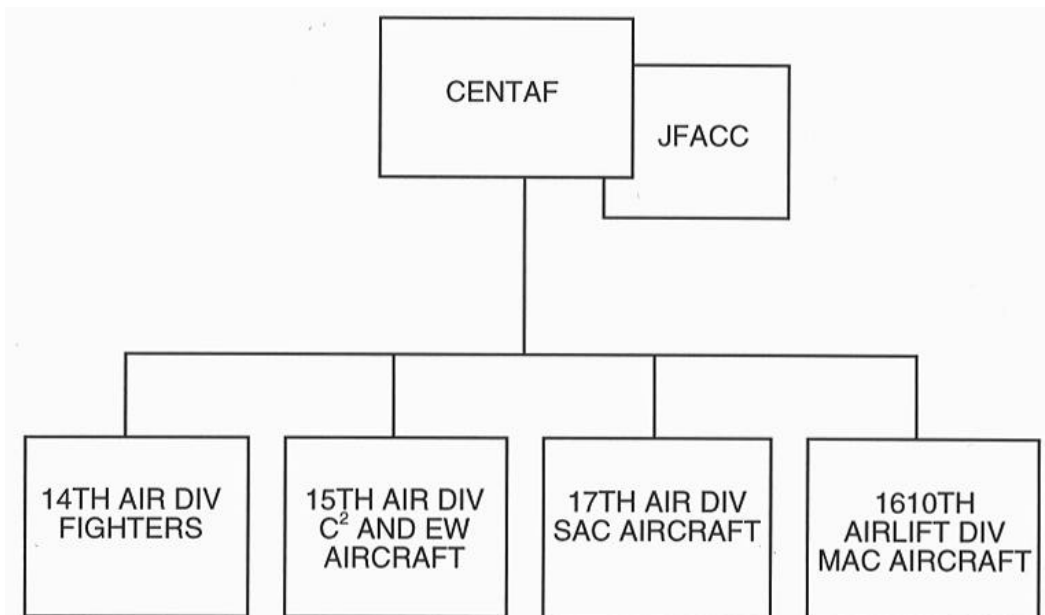
Despite these formal limitations, Schwarzkopf gave Horner a great degree of centralized control by giving him tactical control of all Coalition air forces. In addition, he designated Horner as the airspace control authority. This allowed Horner to task his CENTAF wings and those sorties the other services made available to him through a daily air tasking order (ATO). It also allowed him to control execution of those tasks through the air force tactical air control system (TACS).⁵

As a component commander with a colocated headquarters, Horner enjoyed daily access to the CINC that other subordinates further down the chain, especially the army corps commanders, did not. Schwarzkopf knew and trusted Horner; and Horner made a concerted effort to develop his personal relationship with the CINC.⁶ Horner also had cordial and professional relationships with his fellow component commanders, Lt Gen John Yeosock, the Third Army commander, Vice Adm Henry Mauz, the naval component commander, and Lt Gen Walter Boomer, the Marine component commander. Horner said, "God, we all got along great."⁷ Horner also cultivated a close working relationship with the Saudi Arabian military leadership, most notably with Lt Gen Khalid bin Sultan bin Abdul Azziz, the Saudi theater commander. This cordiality also existed with Lt Gen Gary Luck, the US XVIII Airborne Corps commander. Relations with Gen Frederick Franks, the VII Corps commander, however, were somewhat strained. In a 1993 interview, Horner related that "before the war, VII Corps [Franks] was the one that came in and tried to carve out 300 sorties . . . and I fell on my sword [trying to stop it]."⁸

Organization, Planning, and Control

Horner had a great deal of faith in his primary deputy, Brig Gen C. Buster Glosson, who became the CENTAF director of combat plans. Horner delegated the planning and control of daily flying operations to Glosson much as Kenney delegated control to Whitehead during World War II. Given the CINC's objectives, Horner's concept of operations, and the framework for an offensive air campaign developed by Warden, Glosson and his staff had the time and freedom of action to plan the initial phases of the air campaign in detail. As the air forces built up during Desert Shield, Horner kept his span of control manageable by naming Glosson as one of four provisional air division commanders with command of all CENTAF fighter wings.⁹ Glosson, thus, became responsible to Horner for both the planning and the execution of the Desert Storm air plan.¹⁰

During Desert Shield, Horner exercised his tactical control of air operations through the ATO produced by his staff at the tactical air control center (TACC) in Riyadh. Before the war this order consisted of the training schedules of the deployed wings as well as CENTAF tasking for air defense combat air patrols and reconnaissance missions along the Saudi Arabian border. This procedure gave the CENTAF staff practice at producing an ATO and allowed the flying units to become familiar it.



Source: James A. Winnefeld and Dana J. Johnson, *Joint Air Operations: Pursuit of Unity in Command and Control, 1942–1991* (Annapolis, MD.: Naval Institute Press, 1993), 112.

Figure 5. CENTAF Command Relationships

The Navy and Marines were wary of Horner's role as the JFACC and preferred to carve out their own areas of responsibility rather than submit to his centralized control of the theater air assets.¹¹ In addition, the Navy had concerns about the vulnerability of the air operation to communications failure or decapitation through an attack on the TACC. Admiral Mauz recommended an "omnibus ATO" with dedicated areas of responsibility and mission-type orders as a backup option in the event of lost communications or destruction of the TACC. Horner, however, objected to the symbolism of "route packages" that have been anathema to Air Force centralized control doctrine since Vietnam.¹²

The corps commanders also had reservations about the JFACC's role and were concerned about their lack of influence over interdiction targeting within their corps sectors.¹³ Horner understood their concerns, but he believed that they saw the war from a limited perspective. He offered to implement a joint targeting board of general officers to establish general targeting priorities, but Schwarzkopf, acting as his own land component commander, demurred.¹⁴ The primary interface between Horner's planners and the corps commanders, thus, became the Army's battlefield coordination element (BCE) in the TACC.¹⁵ As planning continued for the air offensive, Schwarzkopf insisted that the corps commanders have an increasing influence on the targeting process during the battlefield preparation phase.

To exert this influence the corps commanders developed their own databases of interdiction targets and prepared target lists to forward to Horner through the BCE.

Planning for the air operations was highly centralized at the TACC. Access to the plan was restricted to Glosson's offensive planning cell and two "trusted agents" in each wing.¹⁶ Glosson's staff had months to plan the first two days of the war, including the force packaging, air refueling, and target area deconfliction for thousands of combat sorties. By December, with the help of national intelligence sources in Washington, the target list for the first two days grew from 84 to 238.¹⁷

With guidance from Schwarzkopf and Horner's concept of operations, Glosson's planners determined the desired operational effects and translated them into a daily target list known as the master attack plan (MAP). An invention of the Gulf War, the MAP replaced the traditional five-paragraph field order used to communicate missions and tasks to operational units.¹⁸ The intent of the MAP was to "operationalize" the air campaign strategy by matching targets with suitable aircraft types.¹⁹ However, the MAP differed from the operating instructions used in World War II by Kenney and Whitehead because it was only good for 24 hours. It listed each target to be attacked that day and the type of aircraft scheduled to hit it, but it did not describe the desired operational effect to be achieved over any time period greater than 24 hours.

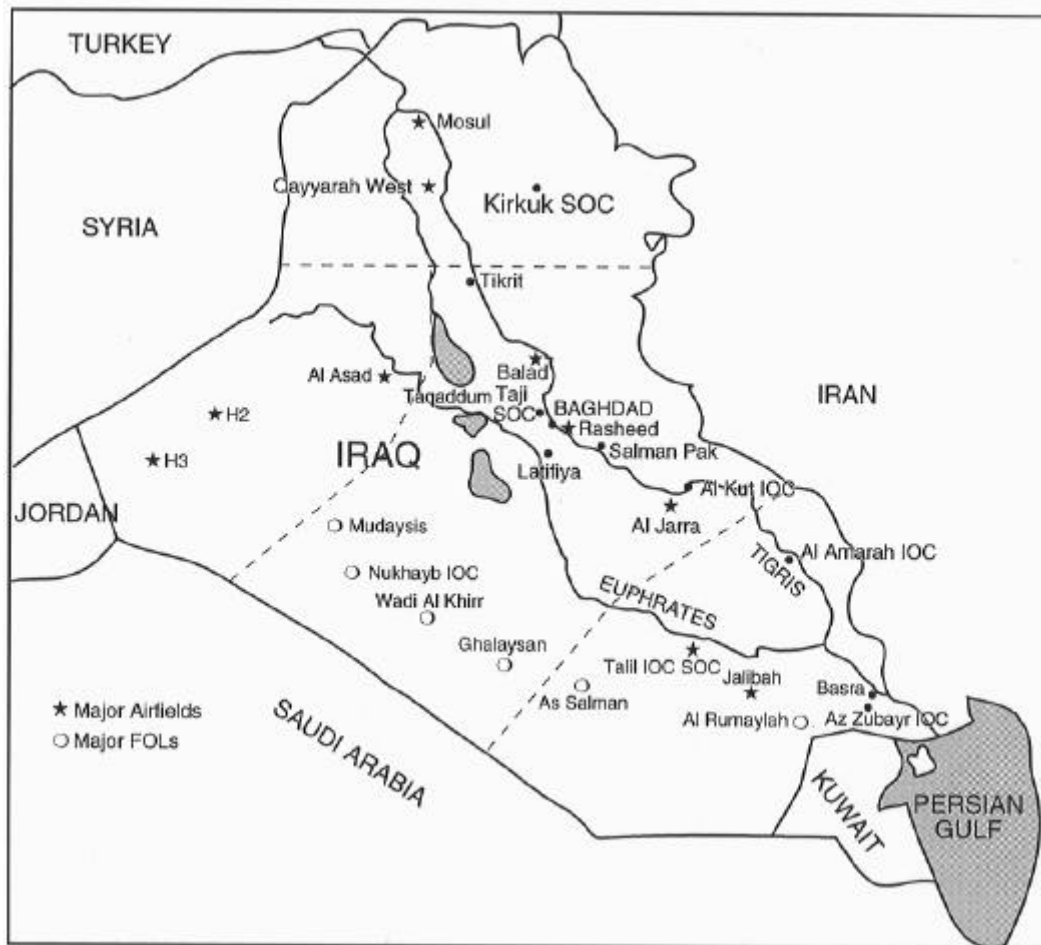
Meanwhile, the idea of opening a second front from Turkey was sold to Schwarzkopf and the JCS by the United States European Command (USEUCOM). By September 1990 the JCS approved the deployment of a composite fighter wing to Incirlik Air Base, Turkey, assembled from American squadrons throughout Europe. Since there was uncertainty as to whether the Turkish government would allow combat operations from Incirlik, the CENTAF plan did not include the Incirlik wing.

In December the wing was still in the formative stage and the wing's chief planner, Lt Col Maris "Buster" McCrabb, asked how it could fit into the overall air campaign given Turkish approval to employ. CENTAF replied by giving the wing a mission-type order to open a second Iraqi front whenever possible. Given this command intent the order included three broad tasks: (1) deny sanctuary to the Iraqi air force by attacking Iraq's northern air bases; (2) tie down Iraqi ground forces near the Turkish border; and (3) attack nuclear, biological, and chemical facilities in northern Iraq.²⁰ With this broad guidance McCrabb and others began to build a subcampaign plan for the wing.

A week before the war CENTAF gave the wing its first written guidance in the form of a list of 10 targets. The targets included hardened facilities such as Iraq's northern sector operations center and intercept operations center as well as airfields and chemical storage sites. The wing objected to the list because some of the targets required penetrating precision weapons that the wing lacked. Furthermore, the list did not contain SAM sites that had to be attacked to gain air superiority over northern Iraq. Therefore, McCrabb suggested the wing continue to operate under the mission-type orders and

develop its own plan, to include an air superiority phase and attacks against targets more appropriate for the wing's aircraft.²¹ Horner agreed and gave the wing a large area of responsibility north of Baghdad, primarily because some of the wing's aircraft lacked the range to attack south of Baghdad and also because most of the initial CENTAF targets required precision weapons. This decision gave the composite wing a de facto "route package." However, Horner retained veto authority over the wing's operational plans as well as the authority to task the wing by exception.

The 7440th Composite Wing (Provisional), under the command of Brig Gen Lee A. Downer, became the combat arm of Joint Task Force Proven Force formed by Gen John R. Galvin, commander in chief of the European Command. The final elements of Proven Force deployed to Incirlik as the war started on 17 January 1991; Galvin retained operational control over Proven



Source: *United States Gulf War Airpower Survey (GWAPS)*, vol 2, *Operations and Effects and Effectiveness* (Washington, D.C.: Government Printing Office, 1993), 73.

Figure 6. Proven Force AOR

Force in case it was needed for a NATO contingency.²² He named Maj Gen James Jamerson as the task force commander whose mission was to “develop a sustained joint and combined combat capability in Turkey to deter hostilities in Southwest Asia. In the event of hostilities and with the permission of the Turkish government, coordinate and conduct military operations in response to mission tasking from USCINCCENT.”²³ Galvin delegated tactical control of Proven Force to Jamerson, giving him the authority for local direction and control as required to perform his assigned missions or tasks.²⁴ However, Horner had the authority as the JFACC to task Jamerson’s force.²⁵

Downer’s wing included F-111E and F-16C strike aircraft, F-15Cs, F-4G Wild Weasels, EF-111s, tankers, E-3 AWACS, an EC-130, and RF-4 reconnaissance aircraft. Thus, it was self-contained and capable of semi-autonomous operations. In addition, Downer had a larger staff than the other wings in CENTCOM because it was augmented by contingents from EUCOM, USAFE, and Seventeenth Air Force. Downer divided his staff into combat plans and operations divisions as had Horner in Riyadh. McCrabb had a broad operational background and TACC experience, so Downer made him chief of the ATO production cell.²⁶ With a mission-type order, Downer operated in accordance with Horner and Schwarzkopf’s command intent, but the method of accomplishing his three broad tasks was left to him.²⁷

In the south Glosson briefed his wing commanders on the overall outline of the plan in December, but on the eve of the war only Glosson and his primary air planners, Lt Col Dave Deptula and Maj “Buck” Rogers knew all the details.²⁸ With a long time to develop and revise the plan, they programmed each sortie over the first two days for maximum efficiency. Glosson’s staff turned the daily master attack plan into combat sorties through the daily Coalition ATO, which his staff constructed over a three-day period. It included targets, aimpoints, numbers of aircraft, call signs, times on target, weapons, IFF codes, and all support assets. With the addition of airspace control procedures and other special instructions, the ATO often ran 800 pages in length.²⁹ At first, the ATO was flown to each wing and aircraft carrier by courier, but as the Air Force’s CAFMS system became functional at the wings, the courier system became a backup when CAFMS failed. Navy carriers, lacking working CAFMS system, relied on the air couriers throughout the war.

The work involved in processing the high volume of reports and intelligence flowing into the TACC in order to generate the ATO caused the size of Horner’s staff to swell to nearly 2,000 people.³⁰ Planning and constructing the ATO was a monumental struggle. The 48–72 hour ATO planning cycle meant that the ATO often lagged behind the pace of the war. In many cases the ATO was overcome by events, requiring last-minute tasking changes. Because the ATO was a complex web of coordinated and interdependent attack and support missions, these changes “rippled” throughout the plan, often causing turmoil and the lack of proper escort, SEAD, or refueling support in the air.³¹ However, to

ameliorate the adverse effects of last-minute changes, Glosson authorized subordinate commanders to take appropriate actions on their own, to include procuring fighter escort and air refueling support that was not stipulated in the ATO.³² For some targets such as airfields, Glosson occasionally gave his wings the latitude to pick their own aimpoints, but this caused problems of assessing battle damage for the centralized intelligence staff in Riyadh since it was unaware of these aimpoints.³³

Frequent mission changes were handled on the ground through secure telephone communications among dispersed wings and in the air by elements of the decentralized TACS. These included command elements aboard the AWACS, ABCCC, and JSTARS aircraft that Horner empowered to divert aircraft from their primary targets and take actions they deemed appropriate to the combat situation. However, the ability of wings to coordinate and mission plan properly from dispersed locations was limited by the saturated telephone lines and the unsuitability of the CAFMS system for interwing coordination.³⁴ The composite wing in Turkey, possessing all of the necessary strike elements, and able to coordinate face-to-face, did not have these problems on the same scale.

The 7440th took a different approach to tasking its squadrons. McCrabb planned the wing's attacks four to seven days in advance, giving the squadrons mission-type orders and allowing the mission commanders to build strike packages. Downer was also free to task his own restrikes, and he planned to restrike many targets periodically due to the lack of national intelligence assets for battle damage assessment.³⁵ The wing produced its own ATO and flew 50–60 combat sorties per day in two or three waves at Downer's discretion.³⁶

The Marine air wing commander achieved the same result by allocating sorties to the JFACC for inclusion in the CENTAF ATO and then flying extra sorties as he saw fit. In addition, CENTAF allocated interdiction "kill boxes" to the Marine wing that were in front of the Marine ground forces and served as another de facto route package.³⁷ There was some criticism at CENTAF because the Marines often chose to interpret the ATO as a mission-type order, but this didn't bother Horner because "it made sense."³⁸

A few weeks into the war Horner became uncomfortable with the composite wing's autonomy and told Deptula to "get control" of Proven Force. Deptula continued however to accept the wing's targeting proposals as long as McCrabb's targets were in line with Deptula's master target list.³⁹ The wing continued to control its own operations with four primary exceptions: the CENTAF-directed attacks on Scuds, the maintenance of barrier CAPs along the Iranian border when the Iraqi air force began to flee, the attack of NBC sites near the war's end, and attacks on the Taji military complex.⁴⁰

At the intracomponent level Horner's staff solicited mission-type requests for interdiction effects from the corps commanders, but there was never any serious dialogue among the major unit commanders concerning the viability of mission-type requests.⁴¹ Coming from the European theater, Franks was used to designating battlefield air interdiction targets that had an immediate

effect on his scheme of maneuver. Horner preferred to retain more control of interdiction targeting, but he agreed to accept corps target nominations. This forced Horner's staff, in conjunction with the BCE, to prioritize these nominations coming in from the corps for inclusion in the master attack plans and ATO.

Problems occurred when the corps commanders, especially General Franks, nominated targets among the frontline Iraqi divisions at the same time Schwarzkopf wanted Horner to concentrate on the Republican Guard divisions in the rear. Horner, acting on the CINC's guidance, opted to not hit many of the corps targets, frustrating the corps commanders, who apparently received little, if any, feedback on the CINC's air targeting priorities through ARCENT. Schwarzkopf directed Horner to attrite 50 percent of the Republican Guard forces in the KTO as a prelude to ground combat, but the 50 percent number was too general. Glosson responded by focusing airpower on what he believed to be the most relevant Iraqi systems: their tanks, armored personnel carriers, and artillery. Franks, however, saw artillery as the main threat to his scheme of maneuver.⁴² By focusing on the structure of Iraqi divisions, rather than their process of ground maneuver and defense, this directive produced a "bean count" mentality, as opposed to the well-thought-out attacks made to produce specific functional effects during the strategic phase of the campaign.

In addition, Schwarzkopf frequently micromanaged the air targeting, changing the ATO by shifting attack sorties from one Iraqi division to another at the last minute. This also caused the corps commanders to complain that they weren't getting the air support they needed for battlefield preparation.⁴³ Horner said, "We would brief him [Schwarzkopf] on corps targets and he would say 'No, no, no, here is what I want done. . . . Put 200 sorties on this one [division] and 30 sorties on that one' and stuff like that. Now that frustrated the army greatly because they thought nobody was listening to them."⁴⁴ Poor communications between Schwarzkopf's staff and these field commanders exacerbated the problem. The corps commanders were not always privy to the CINC's guidance; when the CINC canceled an attack on a corps target, the VII Corps commander, who often lacked feedback that it was a CINC decision, blamed Horner and his staff.⁴⁵

To get relief from such criticism, Horner asked Schwarzkopf's deputy, Lt Gen Calvin Waller, USA, to review and approve Horner's interdiction target list during a daily meeting before their inclusion in the next ATO.⁴⁶ Contrary to the GWAPS findings, Horner insists that Waller's review committee did not constitute a joint targeting board, per se and that Waller never changed CENTAF's targeting plans for the KTO substantially.⁴⁷ Nevertheless, the formation of such a board with its focus on targets versus operational effects had the potential to degrade Horner's airpower control.

There were other problems with the army's targeting. The corps targeting cells often lacked the intelligence "picture" that Horner's staff had. When Horner's airborne command elements diverted preplanned ATO sorties to targets of opportunity, the corps targeteers were not able to keep up with

what targets had been hit. Further, army damage assessments often failed to give air sorties proper credit for target destruction. Thus, the corps target databases became outdated and some of the targets nominated by the corps were of low priority to Schwarzkopf or had already been struck. In addition, the corps at times nominated targets that had moved by the time they showed up in the ATO.⁴⁸

Results

At the wing level mission-type orders worked well for the composite wing in Turkey. The 7440th successfully accomplished Horner's intent by opening a second front against the Iraqis while operating with great latitude and attacking targets most suited to its aircraft and weapons. CENTAF occasionally tasked the wing by exception and sent its own aircraft into the northern AOR to hit hardened targets; otherwise, Horner empowered Gen Downer to effectively "fight" his wing. The 7440th was, however, an exception to the norm. All other combat wings were tasked precisely every 24 hours by the TACC, and wing commanders had little input on their wing's operations. Furthermore, the centralized system was vulnerable to enemy action. Had it been rendered inoperative, the CENTAF wings had almost no basis for generating sorties.

At the theater level, although the air-to-ground phase of the campaign produced superior results, the friction between CENTAF and VII Corps indicates the danger inherent in communicating through lists of individual targets rather than in terms of desired operational effects. It also highlighted the friction inherent in deploying major formations from one theater to another where operational procedures differ.

Analysis of Leadership

With the exceptions detailed above, Schwarzkopf's trust and willingness to let Horner run the air war was a major factor in its success, even though Horner had overwhelming assets. They knew and respected each other; and Horner likened their relationship to that of Generals MacArthur and Kenney in World War II. In 1993 Horner said, "Kenney was my hero. . . . I tried to emulate Kenney. I'm not the brains behind Schwarzkopf's success, but I tried to emulate wherever possible that [Kenney and MacArthur] relationship. Remember, the air campaign was completed about the end of August and it was briefed to Schwarzkopf. He accepted it in total, generously."⁴⁹

Schwarzkopf had faith in Horner's strategic plan and his commitment to close air support so he did not interfere with the targeting details of those missions. However, his meddling in KTO targeting and his insistence that the corps commanders pick targets during the battlefield preparation phase infringed on Horner's authority and responsibilities.⁵⁰ In addition, it caused ill will from the corps commanders when their targets weren't attacked.

General Horner feels that the ground commanders suffered from a lack of trust in the JFACC's ability and willingness to support them, saying, "The

army guys are of the mentality . . . that they don't know how to trust, and if they don't own it [air support], it won't be there."⁵¹ Though at least one member of Horner's staff solicited mission-type interdiction requests, the corps continued to submit detailed target lists.⁵² After the war, some army commanders lamented that they were never able to get control of the air effort.⁵³

From the Army perspective, the ground commanders felt that control of airpower was necessary to shape the battlefield in coordination with their long-range ATACMs and attack helicopters to support their maneuver plans. They were also frustrated that the Air Force chose to categorize all targets beyond fire support coordination line (FSCL) as air interdiction (AI), eliminating the category of battlefield air interdiction (BAI), used in the European theater, which allowed the corps commanders more influence on air targeting beyond the FSCL that directly affected their battle plans.⁵⁴

On a lower level, the trust of Generals Galvin and Horner was instrumental in the composite wing's success in operating with mission-type orders. Horner's willingness to delegate operational decision making to General Downer allowed Downer to "fight" his wing, unlike CENTAF wing commanders who were dependent on the detailed daily ATO. In addition, Horner was not inhibited by doctrinal concerns from giving Downer his own area of responsibility and tasking him by exception. Though Horner was wary of the "route package" symbolism, he was comfortable giving the wing relatively free reign within its AOR as long as he retained the authority to redirect the wing's efforts or hit targets in the north with his other assets. Downer, in turn, delegated responsibility for combat planning to his staff who often tasked the wing's squadrons with mission-type orders.⁵⁵

Analysis of Organization

Another key to the 7440th wing's successful autonomy was its composite, self-contained structure. With organic AWACS, escort, jamming, reconnaissance, and tanker support, the extensive coordination required for force packaging was easily handled at the wing. Like Kenney's air task force commanders, Downer had all the resources necessary to accomplish his tasks in accordance with Horner's intent. As McCrabb said after the war, "One way you make mission-type orders work is with small, self-contained units who don't need to coordinate for outside help."⁵⁶

Downer had one advantage over Kenney's commanders in that his assets were based together throughout the war, eliminating the need for extensive communications between separated squadrons. Face-to-face coordination between the mission commanders, support flight leaders, and AWACS command elements made the wing more responsive to changes in tasking than the southern wings who were dependent on the theater phone system and CAFMS for interwing coordination.⁵⁷ In addition, the composite wing had sufficient staff and expertise, in the form of McCrabb and others, to do its own targeting. Downer's staff also had the advantage of owning organic

reconnaissance capability and having the USAFE intelligence apparatus in direct support.

Finally, composite operations required the selective use of two-level maintenance, eliminating many intermediate-level repairs at Incirlik. To make this system work, the wing required a large amount of dedicated airlift from USAFE.⁵⁸ With this complete package of resources, Downer's wing could operate without daily guidance from Riyadh, as could the composite Marine air wing. In contrast, the other Air Force wings in the south were dependent on the TACC staff for assignment of support assets on a daily basis.

Analysis of Technology

The proliferation of secure voice, data, and IFF technology enhanced the connectivity of disparate air elements during the war. The proliferation of cockpit video recorders helped overcome battle damage assessment problems to make timely restrike decisions. Despite the composite wing's self-contained structure and reduced communications requirements, Downer's planners relied on secure communications with Glosson's staff for periodic updates on General Horner's command intent, coordination of CENTAF missions into the northern AOR, and detailed tasking by exception.⁵⁹ Had Downer's squadrons been separated, their reliance on this technology would no doubt have increased greatly.

In both the northern and southern wars, decentralized execution via the TACS was extremely important in the daily exercise of air auftragstaktik at the tactical level. The radio and data link technology of AWACS, JSTARS, and electronic intelligence equipment usually allowed the CENTAF planners and airborne command elements to orient themselves to changing combat conditions, avoid fratricide, and make timely tactical decisions as necessary. In the KTO the airborne command elements had the authority to divert attacks from preplanned ATO targets to fleeting targets of opportunity. The use of secure and jam-resistant radios helped make the system work.⁶⁰ However, radio range and data link limitations caused occasional coordination problems between the northern and southern AWACS when CENTAF forces crossed the border into the Proven Force AOR.

The frequent changes to the CENTAF ATO required extensive telephonic premission coordination between TACC planners and the dispersed homogeneous wings throughout the theater.⁶¹ The lack of timely battle damage assessment also required the sharing of pilot mission reports with the TACC and among wings attacking the same targets. All of these communication requirements put a tremendous strain on theater communications. The Gulf War Airpower Survey concluded that the proliferation of secure telephone and fax equipment strained the theater communications system to the breaking point. Without it, however, the system could not have responded to the changes in the centralized ATO that rippled throughout the theater.⁶² The proliferation of electronic IFF systems helped prevent confusion and fratricide when aircraft deviated from the ATO

game plan, striking targets in unplanned areas and crossing the border between the CENTAF and Proven Force AORs.

Analysis of Procedures

Three procedural factors enabled mission order command of the composite wing: a clear statement of commander's intent and broad tasks, an implicit tactical employment doctrine, and the deconfliction with CENTAF operations by assignment of a distinct area of operations in northern Iraq.

The 7440th Composite Wing in Turkey got relief from the detailed daily guidance of the Coalition ATO and continued to operate on a telephonic mission-type order that contained three broad but well-defined tasks. From these tasks Downer's planners built an entire subcampaign plan for the wing's area of responsibility. If the TACC had blown up or been hit with a chemical Scud, Downer had clear guidance with which to continue his part of the war.⁶³ The other wing commanders did not.

In a survey conducted after the war, the mission commanders and flight leaders polled said the tactical employment doctrine ingrained throughout the tactical air forces, and reinforced in exercises such as Red Flag, was vital to the war's success.⁶⁴ Even within the composite wing, last-minute tasking changes caused a degree of turmoil in the air. Despite the changes, the mission commanders and supporting flight leaders, possessing the pilot's ingrained "common cultural bias" gained from years of standardized training, knew what to do to make the missions successful. As Downer said, "Years of training and exercises that were common to all the squadrons allowed the composite wing to enter the fight on the run from day one."⁶⁵

Finally, the wing's area of responsibility north of 34 degrees, 30 minutes latitude removed much of the need for centralized target area coordination. In the southern war the volume of sorties made midair collision and fratricide a major threat. Those problems were less severe in the northern AOR when communications between Proven Force and Riyadh allowed coordination of "cross border" traffic. Similarly, the dedicated Marine "kill boxes" in the KTO constituted a route pack that allowed the marines to interpret the ATO as a mission-type order.⁶⁶

Procedural problems and the threat of fratricide did occur, however, when CENTAF flights ventured into Proven Force airspace without prior coordination. For example, CENTAF F-15s intercepting MiGs north of the Proven Force boundary discovered that the radio frequencies and code words were different between the CENTAF and Proven Force AORs.⁶⁷ Common procedures, combined with better AWACS communications would have reduced the friction that occurred when flying between AORs.

In summary, McCrabb asserts,

Route packages, or whatever you want to call them, are the way to go if you want to operate with mission-type orders. They aren't a problem as long as you have unity of command in the form of a JFACC who can focus the air effort in the areas he needs to. If more than one wing needs to operate in an area, then the other wings should be placed in supporting roles, and the mission commanders should be from

the wing that is most familiar with the area. The targeting and coordination details can be worked out at the wing level.⁶⁸

The fact that this conclusion is directly contrary to the perceived lessons of Korea and Vietnam indicates that the acceptance of mission-type orders as air force doctrine may face certain cultural difficulties.

Notes

1. Gen H. Norman Schwarzkopf, *It Doesn't Take a Hero* (New York: Bantam Books, 1992), 320.
2. United States Air Force Gulf War Airpower Survey (GWAPS), vol. 1, pt. 1, Planning and Command and Control (Washington, D.C.: Government Printing Office, 1993), 2.
3. JCS Pub 3-01.2, Joint Doctrine for Counterair Operations, 1 April 1986. Apportionment of air sorties is the determination and assignment of the total expected effort by percentage and/or by priority that should be devoted to the various air missions or geographic areas for a given period of time. Apportionment is a CINC prerogative.
4. CINCCENT OP Order, Section 3E26G, 10 August 1990 (GWAPS, vol. 1, pt. 2, 42).
5. Lt Col Robert E. Duncan, "Responsive Air Support—Desert Shield/Storm," *Air Land Sea Bulletin* 92-3 (30 September 1992): 8.
6. Gen Charles A. Horner, commander of CENTAF, interview with Maj Mason Carpenter, 27 December 1993.
7. *Ibid.*
8. *Ibid.*
9. Lt Gen Charles A. Horner, "The Air Campaign," *Military Review*, September 1991, 20.
10. GWAPS, pt. 2, 72.
11. *Ibid.*, 51-52.
12. *Ibid.*, 52. Route packages were divisions of airspace that the Air Force and Navy used to divide targeting responsibilities in North Vietnam after the Navy refused to place its air assets under the control of a single air commander. These areas were exclusive to each service, and there was no single air commander with authority over all areas who could mass joint airpower where it was needed most. As a result of this fragmentation of command and firepower, the Navy had less than the required forces to sustain 24-hour operations in its areas of responsibility, and Air Force commanders lacked the authority to divert Navy sorties to targets of opportunity in Air Force areas. See also Gen William W. Momyer, *Airpower in Three Wars* (Washington, D.C.: Government Printing Office, 1978), 91-97.
13. Brig Gen Robert H. Scales, Jr., *Certain Victory: The US Army in the Gulf War* (Washington, D.C.: Department of the Army, 1993), 178.
14. GWAPS, pt. 2, 62.
15. Scales, 180.
16. GWAPS, pt. 2, 167.
17. GWAPS, pt. 1, 10.
18. *Ibid.*, 9.
19. Lt Col Dave Deptula, CENTAF Planning Officer, interview with Maj J. Scott Norwood, 14 May 1993.
20. Lt Col Maris "Buster" McCrabb, Maxwell AFB, Ala., interview with author, 6 April 1994.
21. *Ibid.*
22. Brig Gen Lee A. Downer, "The Composite Wing in Combat," *Airpower Journal* (Winter 1991): 4.
23. USCINCEUR Order 001, 231243Z Dec 1990. See also GWAPS, pt. 2, 391.
24. GWAPS, pt. 2, 393.
25. Downer, 4.
26. McCrabb interview.

27. Ibid. Once Jamerson's JTF staff assumed "control" of the operation, it decided to issue a daily operations order to the composite wing after conferring with CENTAF in Riyadh. However, McCrabb ensured that the JTF staff did not interfere with the wing's air plan by briefing CENTAF on the targets he wanted to hit ahead of time.
28. GWAPS, pt. 2, 208.
29. GWAPS, Summary Report (Washington, D.C.: Government Printing Office, 1993), 5.
30. GWAPS, pt. 2, 66.
31. Ibid., 41.
32. Ibid., 224.
33. GWAPS, vol. 2, Operations and Effects and Effectiveness, pt. 2 (Washington, D.C.: Government Printing Office, 1993), 299.
34. Maj J. Scott Norwood, Thunderbolts and Eggshells: Composite Air Operations in Desert Storm (Maxwell AFB, Ala.: Air University Press, 1994), 29. CAFMS was dysfunctional for mission coordination in the eyes of most mission commanders surveyed after the war due to the poor user interface and excessive transmission time.
35. McCrabb interview.
36. GWAPS, Summary Report, 16.
37. James A. Winnefeld and Dana J. Johnson, Joint Air Operations: Pursuit of Unity in Command and Control, 1942-1991 (Annapolis, Md.: Naval Institute Press, 1993), 126.
38. Horner interview.
39. GWAPS, vol. 1, pt. 2, 228.
40. McCrabb interview.
41. Lt Col Robert Duncan, CENTAF TACC combat plans officer, interview with author, 18 April 1994.
42. Gen Frederick Franks, VII Corps commander in Desert Storm, interview with Maj Mason Carpenter, 23 March 1994.
43. GWAPS, vol. 2, pt. 1, 284.
44. Horner interview.
45. GWAPS, Summary Report, 155.
46. Horner interview.
47. Ibid.
48. Scales, 181.
49. Horner interview.
50. Ibid. General Horner sees a joint targeting board as the Army's attempt to become airpower's master again. Though Horner offered to work with a joint targeting board when he sold the JFACC concept to Schwarzkopf, he intended for such a board to produce general targeting guidance and priorities, not pick individual targets.
51. Horner interview.
52. Duncan interview.
53. Scales, 369.
54. Ibid., 174-75. In Desert Storm, the FSCL was the dividing line between CAS and air interdiction (AI). In the European theater, the corps commanders were used to pick BAI targets between the FSCL and the reconnaissance and interdiction planning line (RIPL), beyond which AI targeting was the sole province of the Air Force. Horner used no such line and grouped BAI under the category of AI during Desert Storm; thus causing the ground commanders to worry about their ability to integrate their long-range missiles with Air Force assets to shape the battlefield.
55. McCrabb interview.
56. Ibid.
57. Norwood, 29.
58. Downer, 15. Two-level maintenance eliminates the intermediate-level repair of aircraft components done locally to reduce the amount of deployed maintenance equipment and personnel. Repairs are either done on the flightline or at rear area depots. It requires the increased reliability and maintainability of newer aircraft, greater local stockpiles of spare parts, and a reliable transportation system to get parts to and from the depots quickly.
59. McCrabb interview.

- 60. Ibid.
- 61. Norwood, 48.
- 62. GWAPS, vol. 2., pt. 2, 111.
- 63. McCrabb interview.
- 64. Norwood, 60.
- 65. Downer, 12.
- 66. Winnefeld and Johnson, 163.
- 67. Author's personal experience.
- 68. McCrabb interview.

Chapter 5

Conclusions

What then were the common enabling conditions that allowed Kenney and the 7440th Composite Wing to operate effectively under mission-type orders? As the Germans asserted in their 1933 troop leading regulations, an essential condition for mission order command is mutual trust between the senior commander and his subordinates. MacArthur's trust of Kenney was shared by the other major commanders, such as General Eichelberger, who were familiar with Kenney and resolved not to interfere with his control of airpower beyond the realm of close air support. Likewise, Kenney trusted Whitehead and his air task force (wing) commanders, whom he knew well and handpicked for command. The chain of mutual trust ran both ways as Kenney was willing to accept occasional mistakes and risk taking in the interests of local decision making and combat effectiveness. The ability to delegate authority was one of Kenney's greatest traits, and one he looked for in his subordinate commanders.

In Desert Storm, Horner enjoyed a similar degree of trust with Schwarzkopf, who was content to let Horner control the air war with minor exceptions. Though Schwarzkopf gave Horner mission orders to achieve his theater objectives, there is no evidence that Schwarzkopf proposed the use of mission-type requests from the ground commanders for air interdiction in the KTO. Nor is there evidence that Horner preferred to operate with them. Instead Schwarzkopf wanted his corps commanders to have more direct influence on targeting during the battlefield preparation phase; therefore, Horner solicited target nominations. When their targets weren't hit, the army corps commanders, especially General Franks, became frustrated with Horner and the CINC.¹ Horner felt there was a lack of trust in the Air Force and a lack of communication within the Army chain of command that exaggerated the tension.

In the composite wing Downer relied on the trust of Generals Galvin, Horner, and Jamerson, who let him and his combat planning staff run the air war in northern Iraq with broad operational guidance and only exceptional detailed tasking. In addition, Downer trusted his squadron and mission commanders with force packaging decisions. This decision to give Downer relatively free rein was also due to the geographic separation of his wing and its limited ability to integrate into the CENTAF plan without laser-guided bombs.²

In the category of organization, as Martin van Creveld asserts, the employment of small, self-contained units was a primary enabling condition.

In both cases the wings executing mission-type orders were composite in nature and structured for a fairly broad task by the higher headquarters. In both cases the wing commanders also had augmented staffs capable of doing their own targeting. Kenney's air task forces were often unique in their composition, varying in size from a couple of squadrons to several groups. In every case, the task force included bombers and fighters; and the larger forces usually included reconnaissance and airlift squadrons as well. With intelligence and reconnaissance information decentralized, Kenney could then decentralize a great deal of planning to his wing commanders.

The 7440th Composite Wing was similarly task-organized to provide air superiority and strategic attack against several target categories, using conventional munitions. Given this limitation, however, the wing possessed the air assets at one base to let mission commanders construct their own strike packages and coordinate the tactical details face-to-face. This also allowed them to react to short notice tasking changes more readily than those operating from dispersed homogeneous wings in the CENTAF AOR.³

Technical enabling conditions included the proliferation of secure voice and data communications, as well as IFF capability. The communications network, though strained, ensured the connectivity of low-level decision makers, allowing the dissemination of intelligence and radar information. Like the German panzer commanders who depended on their radio networks to share a common "picture" of the battlefield and make rapid, semiautonomous concentration decisions, Kenney's wing commanders relied on theater-level radio decrypts, organic reconnaissance, radar, radio, and telephonic communication to see the battlefield situation and make decentralized decisions. Whitehead put a premium on the connectivity of dispersed groups within each air task force for air defense and strike package coordination. In addition, connectivity with the ground and naval forces allowed timely support at the decisive points during amphibious assault operations. When different task forces concentrated in the same target areas, intratheater communications often allowed them to share their "air intents" in order to reduce target area conflicts.

In Desert Storm, AWACS, JSTARS, ABCCC, electronic intelligence platforms, tactical reconnaissance platforms, and space systems worked together to build the battlefield "picture" for the TACC, TACS, and pilots so that they could stay inside the enemy's decision loop during tactical execution. However, for planning purposes, all of this information wasn't fed sufficiently to the wings. The shortage of satellite imagery and timely battle damage assessment in the TACC and wing operations centers caused cockpit video and pilot reports to serve as a backup. In this respect Downer's wing had the same handicap as the TACC after CENTAF's preplanned strategic targets were struck. Secure telephone and fax systems allowed the TACC and wings to share such information, change tasking rapidly, and coordinate strike operations.

Such communications allowed Downer's wing to coordinate with CENTAF aircraft and B-52s from outside the theater that flew into the Proven Force

AOR. It also allowed other fighter wings to coordinate directly with Army corps air support operations centers (ASOC). Had they been given mission-type orders to operate in concert with a particular corps for an extended period of time, the wings had the ability to communicate directly with these units. The only thing they lacked was the JSTARS picture and better satellite imagery for preplanned strikes. Had Downer possessed precision-guided weapons, he would have needed the same level of strategic intelligence support given the TACC in its building of the strategic plan.

There were also common procedural factors that enabled the use of mission-type orders, the first of which was the communication of command intent and the clear statement of broad tasks for an indefinite period down to the wing level. Kenney and Whitehead gave their wing commanders such guidance on a weekly basis, either by written operating instructions, informal letters, or verbally. Horner and Glosson gave Downer such guidance verbally before the war, and it was valid for the entire campaign. The master attack plan and ATO the CENTAF wings received each day did not substitute for such guidance.

To prevent conflicts between forces executing mission-type orders, procedural means were required to separate forces in space or time. Kenney divided his theater mission into tasks and geographic responsibilities that could be fulfilled by his task force commanders and the Australian composite groups. For instance, while Fifth Air Force wings led the drive up New Guinea, the Australian air groups were given the mission of protecting its left flank. All major Allied units were given periodic mission-type orders for their local responsibilities and tasked by exception for special missions that required detailed coordination with outside units.

When naval task forces shared the same target area with Kenney's forces, he often avoided conflicts by limiting Fifth Air Force wings to night operations. As these task forces concentrated in the Philippines, MacArthur divided the airspace into sectors to ease coordination demands. When given orders to operate in the same sectors, Kenney ordered his wings to circulate their "air intents" in order to coordinate among themselves.

In a similar fashion, Horner minimized conflicts between Proven Force and the Coalition war in the south by giving Downer an area of responsibility and tasking him by exception for attacks near Baghdad. The GWAPS referred to Downer's area as a "de facto route package," conjuring up bad images of the Vietnam War. The analogy, however, is false because in Desert Storm the JFACC had the authority to shift airpower assets among the major AORs, which was not the case in Vietnam. As FEAF commander, Kenney did as well. Horner's assignment of KTO "kill boxes" to the Marine air wing was also a route package of sorts. However, he retained the flexibility and authority to augment the Marine wing in those areas when the ground situation demanded it. Discrete AORs make mission-type orders workable with minimum outside coordination; yet true centralized control allows the flexibility to mass wings in any area the JFACC sees fit.

Finally, the condition that made mission-type orders work in both cases was standardized training and employment doctrine that ensured what the German army called “uniformity of thinking and reliability of action.”⁴ Kenney had taught attack doctrine at the Air Corps Tactical School. When Kenney’s tactical innovations, such as skip bombing, ran counter to standard employment doctrine, he pulled his units out of combat to allow them to develop proficiency before sending them against the Japanese. He also established standard procedures for amphibious support, close air support, reconnaissance, and air defense operations that made it easy for units to shift in and out of the various air task forces and assume such general missions. In addition, he relieved commanders and replaced entire units that did not perform as he expected.

The American air forces of Desert Storm had reliability of action ensured by years of demanding peacetime training and composite exercises such as Red Flag, Cope Thunder, and Cold Fire/Reforger, combined with employment doctrine developed and subscribed to by all of the Air Force’s major fighting commands. This reliability of action also extended to many of the Coalition air forces who received American training or had experience in Flag or NATO exercises. Those that did not, such as the Saudis, had an opportunity to train with American air forces during Desert Shield and formalize standard operating procedures. While Horner instructed his forces to deviate from established low-altitude tactics to minimize combat losses to Iraqi artillery, the core employment principles remained the same.

In his article on *auftragstaktik*, Col Walter von Lossow, Bundeswehr, said, “The smaller the number of tactical principles which are accepted as common knowledge by all concerned, the larger the mass of details which must be contained in orders . . . to limit the risk of things going wrong.”⁵ The converse is true also. Both Kenney’s campaign in New Guinea and the independent actions of the 7440th Wing in Desert Storm indicate that the awareness and acceptance of a robust body of tactical and operational principles is a necessary condition for the effective execution of mission-type orders.

In summary, mission-type orders and requests require uniformity of thinking and reliability of action at all levels.⁶ They result in mutual trust and a willingness to delegate authority and accept risks up, down, and across the chain of command. This is achieved by joint education, planning, and training which develops and demonstrates professional competence. It requires a sound body of common knowledge and doctrine. Mission order command requires a clear statement of intent that includes objectives, priorities, constraints, restraints, desired effects, and broad tasks. It also requires the technical and procedural means to coordinate at the lowest levels to minimize conflicts and the threat of fratricide. Furthermore, it requires the organization of units that are capable of semiautonomous operations for particular tasks and indefinite periods of time. Composite forces, either formal or ad hoc, are necessary for tasks that require the integration of tactical capabilities into supporting packages. However, missions such as stealth attack, air defense, or close air support once air superiority is achieved

may not require composite forces. Mission orders also require that tactical units share a common battlefield orientation achieved through the distribution of all-source intelligence. Finally, organizational staffs must possess the expertise to translate desired operational effects into appropriate targets and force packages.

Notes

1. Gen Frederick Franks, VII Corps commander in Desert Storm, interview with Maj Mason Carpenter, 23 March 1994.
2. United States Gulf War Airpower Survey, vol. 2, Operations and Effects and Effectiveness, pt. 1 (Washington, D.C.: Government Printing Office, 1993), 233.
3. Maj J. Scott Norwood, Thunderbolts and Eggshells: Composite Air Operations in Desert Storm (Maxwell AFB, Ala.: Air University Press, 1994), 44.
4. Lt Col Walter von Lossow, "Mission-Type Tactics versus Order-Type Tactics," Military Review, June 1977, 88.
5. Ibid.
6. Ibid., 91.

Chapter 6

Implications for Today's Air Force

Consequently, when a great captain does arise, irrespective of the circumstances which surround his successes, his system, even if he has no system, is turned into an infallible doctrine, a dogma which becomes a millstone.

—J. F. C. Fuller

Is centralized control via a cumbersome air tasking order (ATO) the approved campaign solution; or is it a vulnerability that a smart opponent can attack to temporarily paralyze American air operations?

Former Air Force chief of staff General Larry Welch said,

I believe we overcontrolled in Desert Storm. We did focus on the CINC's intent . . . but it took us 5000 pages and 72 hours to produce an ATO. We need to adjust our control to what is necessary . . . we could do a lot more stuff over the phone—kill these targets—and do it without tons of paperwork. A centralized, orchestrated air campaign is important; but I say a 5000 page ATO is not the way to accomplish that.¹

Current Air Force doctrine subscribes to the principle of unity of command and the airpower tenets of centralized control and decentralized execution; but what do these “fundamental truths” mean?²

Unity of command achieves unity of effort by placing theater forces under a single commander who has the authority to assign missions and establish common objectives. Today, this unity of command exists in the form of the joint force commander who can delegate operational or tactical control to component commanders if he so chooses.³ Centralized control is the means by which the JFACC ensures unity of air effort by establishing theater air objectives in accordance with the joint commander's intent and by orchestrating the efforts of the various air forces toward accomplishing those objectives. As currently practiced, centralized control implies centralized planning of air strategy, operational effects, detailed targets, and force packages, as well as the performance of battle damage assessment at the theater air operations center (AOC).⁴

Decentralized execution theoretically allows subordinate commanders to determine the tactical details of how to carry out assigned air tasking. In addition, AFM 1-1 states, “The advantages of having a single airman serve as joint force air component commander are increased when he delegates authority for controlling execution to qualified subordinates.”⁵ This now means delegation of tactical control to airborne command elements, forward air controllers, tactical air control parties, and flight leaders. During Desert Storm they became airborne battle managers empowered to make tactical

decisions in the name of the JFACC as the combat situation dictated. However, their decisions are of an immediate tactical nature and have no link to longer-term operational effects. Furthermore, the Air Force's best and brightest, its wing commanders, are not performing this important role. How does this current combination of centralized control and decentralized execution differ from mission order command and auftragstaktik?

The first difference is in the detail of the task and the freedom of action at each command level. At the theater level, the joint force commander will give the JFACC mission-type orders to achieve air superiority and other operational effects commensurate with his campaign objectives. However, when it comes to ground support, the joint force commander may be reluctant to issue such broad guidance or solicit mission-type requests from his ground commanders, depending on his personal relationship with the air commander, the air commander's understanding of the ground operation, and established targeting procedures.

In Desert Storm there was a problem when VII Corps deployed from Europe where General Franks enjoyed influence through the Army group commander on air targeting in BAI and CAS missions. When his corps deployed to CENTCOM, he found the procedures different, and the elimination of the BAI mission reduced his ability to influence air targeting.⁶ Rather than solicit mission-type requests, General Horner accepted air interdiction target nominations, but Franks complained bitterly over his diminished influence when his targets weren't hit. The compromise was the formation of a low-level targeting board that had the potential to conflict with General Horner's authority and responsibility.⁷

In an interview Franks said,

I would prefer more mission assignments [for air interdiction]. I would prefer to say . . . "here's the priority for the air that's in the VII Corps sector. The first priority is to destroy the Iraqi VII Corps command and control apparatus. I don't want them to be sensors on the speed and direction of our attack. Secondly, destroy the artillery that is within range of the breach. And third, make the brigade that is sitting close to the breach go away." Notice I said nothing about tanks. I think that's the kind of dialog that ought to go back and forth. . . . They have an expert targeting apparatus. The ground person ought to say "Here's my priorities and how they fit into my defeat mechanism to accomplish my mission." And then the air force decides the tactics and how they want to mass. Do they need some ATACMs? Okay, you got ATACMs. I think that's the direction we've got to be moving. We did not do that, and that was frustrating.⁸

As a result of such discussion, basic joint operational doctrine and joint interdiction doctrine now incorporate the use of mission-type orders. Joint Pub 3-0, Doctrine for Joint Operations, states that joint force commanders will normally apportion air sorties based on "priority or percentage of effort into geographic areas, against assigned mission-type orders, and/or by categories significant for the campaign" such as counterair, strategic attack, or interdiction.⁹ Furthermore, Joint Pub 3-03, Doctrine for Joint Interdiction Operations, asserts that, "Interdiction operations should normally rely on

mission-type orders. . . . Forwarding missions rather than target nominations gives those responsible for conducting interdiction maximum flexibility to exploit their capabilities.”¹⁰ Clearly, there is a doctrinal imperative for the Air Force to incorporate this concept into its own doctrine in order to operate with mission-type orders and requests at the theater level.

At the wing level, despite the success of Proven Force, the current CENTAF concept of operations gives wing commanders little operational role or freedom of action. Even a composite wing commander, possessing an imbedded AOC and interjected into an immature theater in the role of JFACC, will cease operating under mission-type orders after a few days. Once the numbered air force AOC becomes operational, the composite wing will become just another wing in the centralized ATO.¹¹ However, this concept ignores the fact that during the first days of a wing’s operation in an immature theater, the political spotlight will be focused sharply upon it; thus, it is the least likely time for the national command authorities to delegate operational decision making to a wing commander. Moreover, there is no concept to operate more than one composite wing (including carrier air wings) under mission-type orders.

Once absorbed into the centralized theater operation, wing commanders have little to do besides assign the daily air tasks to their squadrons and manage wing resources. General Horner defends the centralized ATO system, saying, “The ATO is not inviolate. It is just the basic foundation on which to build. It’s a jumping off place. The wing commanders have to provide some feedback if the ATO is stupid . . . but it is an order.”¹² During the war the only evidence of such feedback involved an A-10 wing commander who questioned the wisdom of tasking his A-10s to fly deep into the most lethal air defenses in the KTO.¹³ Junior field grade officers in the AOC exert more control over the conduct of an air campaign than the wing commanders.

AFM 1-1 says, “People should be trained and educated to demonstrate initiative and to seize fleeting opportunities without waiting for orders from above.”¹⁴ However, neither the basic Air Force doctrine nor the Air Combat Command operational doctrine mentions the use of mission-type orders as a means of decentralized planning and execution. Most wing commanders, now general officers in most cases, have little opportunity to show such initiative as they have little control over the employment of their forces. Though airborne battle managers aboard AWACS and ABCCC receive daily command guidance and have the authority to deviate from the ATO, they are not trained or equipped to plan and control operations over an extended period.

Another difference between the current definition of decentralized execution and mission order command is the lack of a commander’s intent statement in the daily air tasking. Such a statement would stipulate the desired operational effects and time periods associated with the tasking. This is the all important “why” element of any task assigned with a mission-type order. This periodic update on command intent should include the current *schwerpunkt*, or main air effort, that serves to unify the actions of mutually supporting wings. If a wing fails to receive its ATO and can not be reached by

phone, the wing commander lacks longer-term guidance to generate offensive sorties because he has not been provided an understanding of where his wing fits in to the current overall plan. In addition, despite General Horner's claim that wing commanders should keep the TACC from ordering anything "stupid," there is no doctrinal imperative for wings to alter their tasking based on a changing situation. Such decisions are normally made at the component level or by airborne command elements who assign alternate targets. In summary, the current concept of centralized control and decentralized execution is not compatible with mission-order command at the wing level.

What Can Be Done?

Though basic Air Force doctrine speaks to the need for initiative and the advantages of decentralization, it never mentions the concept of mission-type orders. In the 1930s the Air Corps Tactical School taught future USAF leaders a 20-hour course on the drafting of effective combat orders, including mission-type orders.¹⁵ A 1989 version of AFM 1-1 drafted by Headquarters USAF/Plans and Operations defined mission-type orders as "a request to achieve a particular effect or achieve an objective on the battlefield: protect a flank; delay, channel, or block an enemy force; create a breakthrough; and so on." Furthermore, this unpublished edition of our basic doctrine espoused the ability of mission-type orders to "enhance flexibility and decentralized execution" as well as "reduce the dependence on communications."¹⁶ The next edition of AFM 1-1 should discuss the utility of this concept in the context of centralized control and decentralized execution, including the conditions that make it feasible.

Doctrine. The Air Force must also overcome its doctrinal aversion to the establishment of relationships between air and ground units. General Kenney routinely gave his air task force commanders mission orders to support assault forces and other ground units for discrete periods of time without relinquishing operational control to the ground commanders.¹⁷ In certain phases of a campaign such a practice may make sense if a specific ground unit becomes the *schwerpunkt*, or main effort of the campaign. An officer in the TACC who suggested that General Horner dedicate flying units in such a manner for ease of tasking during the later phases of Desert Storm was rebuked for suggesting it.¹⁸ This suggests that our doctrine is becoming dogma and ignores the fact that such mission orders can improve response to ground requests and cut the length of the ATO.

During the ground attack phase of a campaign, a wing or group of wings can be designated as an air task force and given mission-type orders to operate in concert with corps-sized ground maneuver elements. This would put wing commanders in direct contact with corps commanders, who would control targeting inside the FSCL and make mission-type requests for interdiction effects in the deep battle beyond the FSCL. This would facilitate integration of attack helicopter and ATACMs assets at the lowest level. With

centralized control, the JFACC could also task such a force by exception for specific missions according to the situation.

A final doctrinal issue is the division of theater airspace into areas of responsibility that can be given to a wing or group of mutually supporting wings for deconfliction purposes to facilitate operations under mission-type orders. The “evil” route pack connotation prevents many officers from considering this useful tool, even under a JFACC who has the authority to shift joint air forces readily among AORs. A RAND study concluded that the use of de facto route packs for Proven Force and the Marine air wing posed no threat to centralized control because these areas were not exclusive, as they had been in Vietnam. Discrete AORs may still be appropriate when warranted by geography, coalition considerations, or command and control limitations that lend themselves to mission-type orders.¹⁹

Education and Training. To make mission-type orders viable at the component and wing levels, professional military education must improve. The officers that the Air Force grooms to become operational planners, wing commanders, and JFACCs must be better versed in targeting for functional effect and in joint operational concepts such as the dynamics of ground maneuver forces. Given the constraints of minimal economic damage and limited offensive forces, operational planners have to look at the enemy in terms of systems and processes to concentrate limited airpower where it will do the most good. Further, only with such training can the air commanders speak the same language as the ground commander and demonstrate the ability to make intelligent targeting decisions beyond the FSCL without being handed a target list.

If a wing commander is to share planning responsibilities under mission-type orders, he must be schooled in the translation of operational effects into a list of targets and aimpoints that achieve the CINC’s objectives. If the desired effect is to shut down an electrical grid for three weeks without destroying expensive generating equipment, the commander must understand this intent and be capable of identifying the key nodes in the system that allow this. The Air Command and Staff College and the School of Advanced Airpower Studies are equipping their graduates to understand enemy systems, processes, and cause-and-effect relationships in strategic targeting, but this education needs to extend to the enemy’s fielded forces as well.

Gen Robert Oaks, the USAFE commander, said “we lose credibility if we don’t understand them . . . Air Force people should better understand the other services and land battle. The key to the JFACC is building confidence in the other components and the joint commander.”²⁰ Lt Col Bill Welch, the member of Horner’s BCE who picked many of the ground targets during Desert Storm said after the war,

Communication and understanding of roles and capabilities are keys to success. The most efficient use of airpower is for the Land Component Commander to give the JFACC his targeting objectives . . . the key is to communicate the type target

and desired effect. Give the air force a mission and let them figure out the best way to do it.²¹

Without understanding joint roles and the dynamics of enemy ground forces, the targeting alternative may become the “servicing” of someone else’s targets or a “bean count” of destroyed enemy equipment. With sparse airpower resources it may be more efficient to “delay the Hammurabi division at the Tigris river for the next 72 hours to support the VII Corps breaching operation” by using JSTARS to help identify and destroy its bridging equipment in the rear echelon, or its command and control elements, rather than attrite all the tanks in the lead echelon.

Air Force professional military education concentrates on airpower theory, history, identification of enemy centers of gravity, and development of strategic air campaigns, but there are shortfalls in joint subjects such as maneuver warfare theory. As a result, too many Air Force officers lack basic joint doctrinal knowledge. The trust implied by mission-type orders requires such an education.

The JFACC training course developed by AF/XO and the Joint Flag Officers Warfighting Course should teach the theory and utility of mission-type orders to all wing commanders and general officers who are potential JFACCs. In addition, exercises such as Blue Flag should incorporate the use of mission-type orders.

Organization. The first and most important organizational condition that ensures mission-type orders do not result in a fragmented air operation like that in Vietnam is the designation of a JFACC who is empowered to plan and control all aspects of theater air employment. With this degree of authority a JFACC can issue mission-type orders to subordinate wings knowing that he can redirect their efforts anywhere in theater at will. Though Kenney lacked this authority over naval air assets, he was able to overcome it with MacArthur’s support and the US Navy’s willingness to place its air under his tactical control when necessary. Fifty years later similar authority was essential to Horner’s success, allowing him to use Proven Force aircraft for attacks near Baghdad and to augment the Marine air wing in its kill boxes when it lacked sufficient strength for the job.

If ground commanders are to feel confident making mission-type requests for interdiction effects, the JFACC staff should have greater joint representation. Though the TACC and Black Hole had joint liaison officers, the highest ranking US Army officer in the BCE was a colonel. General Franks laments that, “It seems to me to be a little difficult if you have a colonel running the BCE and a major general or lieutenant general as the JFACC. That makes discussions a little difficult to get into. The BCE is useful . . . but when it comes to priority of effort, there needs to be discussion between the land component commander and the JFACC.”²² During Desert Storm, there was a great deal of such discussion about the fact that Generals Yeosock and Horner were roommates.²³ However, there was a breakdown in communication between the corps commanders and General Schwarzkopf, who functioned as his own land component commander. The alternate

communication link for the corps commanders was the BCE. A general officer as head of the BCE would carry more weight and be of more immediate help to the JFACC in interpreting the ground scheme of maneuver and assisting in interdiction targeting.

The success of Kenney's air task forces and the 7440th Wing highlight the advantages of composite wings. Not only are they self-contained, but the decentralization of AWACS, tanker, and EW assets makes these critical assets less vulnerable to a show-stopping flightline terrorist attack. The 7440th should serve as a model for additional ad hoc composite wings or composite air task forces during the next war that will complement the composite wing from Mountain Home AFB. With three or four such large wings in a theater, the JFACC will have greater flexibility to use mission-type orders, especially as a fallback to the ATO. The ad hoc nature of such wings can keep peacetime logistics costs manageable; and the combat advantages will make the wartime costs of composite operations worthwhile. To create air task forces from homogeneous wings that can execute mission-type orders, the JFACC will have to designate supported and supporting relationships among wing commanders and let them orchestrate the targeting, force packaging, and refueling. Composite wings, with their imbedded AOC capability, provide an ideal core for a large air task force.

To sustain composite operations, especially using two-level maintenance, the composite wing commander should have tactical control over some theater airlift assets to support his wing logistically. After Desert Storm, General Downer said, "A small contingent of dedicated—although not necessarily assigned—tactical airlift aircraft, however, could improve efforts to resupply parts and make a vital difference in the wing's ability to face all challenges."²⁴ This is exactly what General Kenney did for his air task force commanders.

When asked recently about the feasibility of mission-type orders as an alternative or fallback to the ATO, General Horner replied, "Oh, sure. But then the wing commander would need a bigger staff so he could do targeting and all that stuff."²⁵ Kenney robbed from Fifth Air Force staffs to augment his air task force commanders. Likewise, Ninth Air Force plans to augment the Mountain Home composite wing with more than 45 people from its own staff when the wing deploys for war.²⁶ These enhanced wing staffs need targeting expertise and should exercise with mission-type orders in peacetime to improve their ability to translate theater strategy and desired functional effects into appropriate target groups and aimpoints. As General Downer said, "A wing commander should expect a well-trained team to develop an initial target list within a few days. Continuous analysis and research will refine the product, assuming that time is available."²⁷

Because of their talent, training, and experience, wing and operations group commanders would make the best airborne command elements if given operational control of an AWACS or ABCCC, an area of responsibility, and the authority to make on the spot decisions affecting their own plans. The result of such reorganization would be what Col John Warden refers to as "air legions" at a level of command roughly equal to the army corps.²⁸

Communications Technology. Obviously, to make targeting decisions, wing commanders need access to timely strategic and tactical intelligence for mission planning and assessment. Combat planning naturally centralizes where the intelligence centralizes, and right now, that is in Washington. Fortunately, during Desert Storm, General Glosson, in particular, had access to intelligence in Washington that was not available via the theater intelligence apparatus.²⁹ Wings must have access to this type of intelligence through a distribution system that allows decentralized targeting and battle damage assessment. In a recent article, Lt Gary Vincent insists that John Boyd's preference for implicit trust and small unit initiative over technical solutions to command and control problems is only half the solution. He asserts that the parallel distribution of intelligence and the entire battlefield picture down to the squadron and cockpit level, using lightweight computers, will help provide the coherence among units to execute mission-type orders with minimal guidance and detailed tasking by exception.³⁰

Like the German panzer radio networks, JTIDS is the first such system that allows shared data between relatively "nodeless" networks that are more difficult to disrupt or jam than current voice and data link transmissions. This common picture, combined with a common doctrine could result in acceptable wing solutions to operational problems, assuming the component command is willing to assume the risks associated with loosening the reins of control.³¹ The expansion of JTIDS-like information to all wings and ground maneuver elements could not only increase the ability of small units to see the battlefield and "do the right thing," it could also greatly reduce the risk of fratricide inherent with current IFF and airspace control limitations.

Planning Procedures. Today's air campaign planners must concentrate on the translation of political and military strategy into operational effects and their measurement, rather than working feverishly to do detailed targeting and battle damage assessment. As Colonel Deptula said, the Black Hole planners were worried more about the functional effects of tactical sorties than the physical destruction intelligence analysts focus on.³² However, in their efforts to do detailed targeting, the TACC planners were reduced to looking at the same cockpit video available to the wing planning cells. Certainly, composite wings could have analyzed their own cockpit video recordings and made restrike decisions inside the theater ATO cycle with better preplanning and fewer disruptive last-minute tasking changes. Theater-level air planners should concentrate on strategic intelligence of the enemy, the identification of centers of gravity, the cause and effect relationships of various target groups, and the synchronization of air operations with other maneuver forces. During operations they should focus on the effects achieved by the wings and adjust the command guidance as required.

Secondly, the JFACC should give his wing commanders guidance on the CINC's intent as well as his own at least once a week. This need be no more than a phone call, but he should figure out where each wing fits into each phase of the air campaign and give the wing commanders mission-type orders to be executed at their discretion unless the AOC tasks them by exception. In

this way, the wings will know what the latest command intent is, what their tasks are for more than a day, what their areas of responsibility are, and what other wings will support them if the AOC is destroyed or their communications are disrupted. During Desert Shield, Admiral Mauz was right to question the vulnerability of the centralized ATO system and suggest an “omnibus” ATO with discrete AORs and mission-type orders for major force elements as a fallback plan.

Mission-type orders have a great deal of merit for ensuring JFACC control over theater air targeting, for the decentralization of force packaging decisions, for decreasing the workload and communications flow of the theater AOC, and as a backup measure if centralized planning and control break down. However, to make them work, it requires trust and a willingness to accept responsibility and risk. The Air Force must lay the groundwork by incorporating the concept into doctrine as the Army has done, by organizing more wings capable of semiautonomous operations, and by giving wing commanders and JFACCs the training and resources to use mission-type orders effectively. Auftragstaktik gives a joint force the combat edge at every level, from the joint force commander to “blue four” in his flight of F-15s. If the JFACC is to keep control of theater air and wing commanders are to share more fully in that control, then they must both understand the requirements of mission-type orders and build the “supple chain of mutual trust and respect running downwards and upwards without interruption through all levels of command” that Richard Simpkin says is the human basis for auftragstaktik.³³

Notes

1. Address by former USAF Chief of Staff Gen Larry Welch to the School of Advanced Airpower Studies, Maxwell AFB, Ala., 31 January 1994.
2. AFM 1-1, Basic Aerospace Doctrine of the United States Air Force, 2 vols., 1992, 113.
3. Joint Pub 0-2, Unified Action Armed Forces, 1986.
4. ACCR 2-1, Operational Doctrine: Air Operations, 1992, 3-8.
5. AFM 1-1 (draft), vol. 2, 31.
6. Brig Gen Robert H. Scales, Jr., *Certain Victory: The US Army in the Gulf War* (Washington, D.C.: Department of the Army, 1994), 175.
7. Lt Gen Charles A. Horner, commander of CENTAF, interview with Maj P. Mason Carpenter, 27 December 1993. In that interview, General Horner stated that the Army fears it is no longer in charge and he sees a joint targeting board as an Army bid to reassert its mastery over airpower. He characterizes such a board, if empowered to pick targets, as a harmful “warfare by committee” approach.
8. Gen Frederick Franks, VII Corps commander in Desert Storm, interview (tape recorded) with Maj P. Mason Carpenter, Maxwell AFB, Ala., 23 March 1994.
9. Joint Pub 3-0, Doctrine for Joint Operations, 9 September 1993, 3-37.
10. Joint Test Pub 3-03, Doctrine for Joint Interdiction Operations, 1990, chapter 5, 2-6.
11. Lt Col Robert E. Duncan, CENTAF TACC Combat Plans Staff, interview with author, Maxwell AFB, Ala., 15 April 1994.
12. Horner interview.
13. United States Gulf War Airpower Survey (GWAPS), vol. 2, Operations and Effects and Effectiveness, pt. 1 (Washington, D.C.: Government Printing Office, 1993), 280.

14. AFM 1-1, vol. 2, 234.
15. Air Corps Tactical School, Combat Orders Course, 1939, Maxwell AFB, Ala. USAFHRC 248.40015.
16. AFM 1-1 (draft), HQ USAF/XOX, 31 March 1989, 39.
17. Such relationships were also established in Northwest Europe between the ground armies and tactical air commands (TACs) that were given mission orders to support the drive across France. The Air Force analysis of Ninth Air Force operations concluded that such command arrangements were sound and successful in combat. "The intimacy of the TAC-army partnership in the ETO and the variety of tasks carried out independently in cooperation with associated armies demonstrated the effectiveness of this type of tactical air force organization." Condensed Analysis of the Ninth Air Force in the European Theater of Operations (Washington, D.C.: Office of Air Force History, 1984), 105.
18. Duncan interview.
19. James A. Winnefeld and Dana J. Johnson, Joint Air Operations: Pursuit of Unity in Command and Control, 1942-1991 (Annapolis, Md.: Naval Institute Press, 1993), 135-36.
20. Gen Robert Oaks, CINCUSAFE, interview with author, Maxwell AFB, Ala., 17 February 1994.
21. Lt Col William Welch, "Observations on Joint Combat Operations at Echelons Above Corps," Air Land Sea Bulletin 92-1, March 1992, 18.
22. Franks interview.
23. Horner interview.
24. Brig Gen Lee A. Downer, "The Composite Wing in Combat," Airpower Journal, Winter 1991, 15.
25. Horner interview.
26. Headquarters USCENTAF/A-5 DOXC, AirLand Composite Wing Command and Control Study, 10 March 1994, 6-5.
27. Downer, 14.
28. Maj J. Scott Norwood, Thunderbolts and Eggshells: Composite Air Operations during Desert Storm and Implications for USAF Doctrine and Force Structure (Maxwell AFB, Ala.: Air University Press, 1994), v.
29. GWAPS, Summary Report (Washington, D.C.: Government Printing Office, 1993), 131.
30. Lt Gary A. Vincent, "A New Approach to Command and Control: The Cybernetic Design," Airpower Journal, Summer 1993, 30.
31. Ibid., 31.
32. GWAPS, Summary Report, 241.
33. Richard Simpkin, Deep Battle (London: Brassey's, 1987), 266.

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