A Contrarian View
of
Strategic Aerospace Warfare

A Research Paper
Presented To

Air Force ***2025***

by

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Disclaimer

2025 is a study designed to comply with a directive from the chief of staff of the Air Force to examine the concepts, capabilities, and technologies the United States will require to remain the dominant air and space force in the future. Presented on 17 June 1996, this report was produced in the Department of Defense school environment of academic freedom and in the interest of advancing concepts related to national defense. The views expressed in this report are those of the authors and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States government.

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This publication has been reviewed by security and policy review authorities, is unclassified, and is cleared for public release.

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Acknowledgments

This paper's aim is to expand the boundaries of strategic aerospace warfare. We are indebted to the Strategic Air Warfare Study (SAWS) panel commissioned by General Fogleman, chief of staff of the Air Force. In this forum we were challenged to think and inspired to expand the vision of strategic warfare beyond the boundaries of the traditional roles and missions of strategic aerospace forces. Many thanks to Lt Col Bob Gaudette, one of three members of this writing team.

Executive Summary

This paper presents a new vision of strategic aerospace warfare that expands and looks beyond the traditional roles and missions of strategic aerospace forces. Current joint doctrine divides warfare into three separate levels: strategic, operational, and tactical. Actions in these levels are many times planned, prepared, and executed with very different emphasis on size, scope, and importance. This division of objectives has met with varied success throughout history with many tactical victories leading to strategic defeats. It is important not to disregard the lessons of history as the theory needed to operate effectively in the year 2025 is developed.

The alternate future scenarios developed in the ***2025*** study suggest the future will involve many different interconnected actors. Even in the year 2025, much of the general population may still not have access to communication systems. However, the leadership of most of these organized entities will. Understanding the effect of knowledge transfer systems upon the global system is the key to strategic warfare in the year 2025. As knowledge transfer systems expand, all leaders in the global community will have access to near-real-time information. As a result, the boundaries between the current strategic, operational, and tactical levels of warfare will fade, resulting in only one level of war–the strategic level.

Strategic aerospace forces will be used to influence the will of the adversary's leadership. Due to the impact of information, all actions will have some measurable effect on the contextual elements that make up the leadership's decision-making process. To successfully influence and maintain harmony in the global system of 2025, our aerospace forces must:

1) View the world as a single system by expanding from a regional to global perspective.

2) Recognize the strategic impact of daily operations and decisions on the global system.

3) Create a leadership corps to be expert practitioners in the art of war.

4) Reorganize for efficiency and creativity. Organizations must be flattened to maximize the interchange of knowledge and exploit the potential of a leadership corps.

5) Pass the responsibility for both war fighting and organization, training and equipping to the same location to take advantage of all actions having a strategic impact.

In the year 2025, successful application of all aerospace forces will be conducted with the intent to obtain the appropriate strategic effect while maintaining a balance of the global system. Information dominance is the key to proper employment of the functional concepts of Global Awareness, Global Reach, and Global Power. It is information that allows aerospace power to create strategic influence against an adversary's leadership. To effectively exploit this information vision, organization and capabilities must change to ensure that the strategic aerospace forces of the United States are prepared to skillfully employ the art of war and continue to support the will of our national leadership.

Chapter 1

An Introduction to Strategic Warfare in 2025

"Strategic Aerospace Warfare." These words convey many grand images. A misty morning with hundreds of B-17s forming up for their mission to Berlin. Perhaps a more modern image of Minuteman missiles in silos and B-52s loaded and cocked on alert. The goal of strategic aerospace warfare has historically been to destroy or render useless the "enemy's war making capacity and national will."[1] "Precision" attacks upon petroleum production, ball bearing factories, weapons production facilities, power generating and distribution networks, communications, and even the enemy population, have characterized target sets used in conducting strategic aerospace warfare. The results of these campaigns reported in *The United States Bombing Surveys, The Air War in Southeast Asia*, and *Gulf War Air Power Survey Summary Report* indicate that strategic attack by aerospace forces fell short of the claims made by the airpower experts.[2] In these conflicts the bomber didn't always get through to the target, and if it did the desired effect was not always as planned. Certainly strategic aerospace warfare has been effective in meeting the requirements of some of the national objectives that brought this country to war during the last 50 years, but it has fallen short of the claims proposed by Douhet, Mitchell, and Warden.

In this paper we will examine the role of aerospace forces in conducting strategic warfare in the year 2025. Some have suggested not much will change in the conduct of strategic aerospace warfare between now and the year 2025.[3] They propose we plan and acquire systems that are faster and strike with greater precision. This may be a much too simple approach and one, if wrong, could leave us unprepared to succeed in the world of ***2025***. To be successfully fought and won, wars of ***2025*** need to emphasize the subtleties of strategy and influence rather than relying predominantly on the precision use of brute force. Col Richard

Szafranski in his article, *Neocortical Warfare? The Acme of Skill*, correctly assesses the future of warfare as going beyond the "application of physical force . . . [in the] quest for metaphysical control."[4] But he stops short of recognizing that warfare in the future will not be conducted as it is today. Warfare today is characterized by local or theater clashes with adversaries mostly isolated from the global system. The actors that comprise the world in the year 2025 will be more connected much as organs are connected within a larger organism. This does not say the US won't engage locally. What it does say is the successfulness of engagements in the year 2025 will be measured in terms of both short- and long-term effects upon the balance of the global system. Strategic aerospace forces will remain an important part of the US military as they will provide at times the only viable means to create the strategic influence required to preserve the balance of the global system.

Just as medical science has advanced in its knowledge of preventive medicine, the strategic aerospace forces of ***2025*** will be used to avoid and prevent conflicts. Strategic forces should be used to provide greater preventive control and influence to maintain the health of the global system. The armed forces of today are blunt and brutish and can be called upon to perform "surgery" on the small organs within the larger global organism whenever symptoms of sickness appear. This surgery is expensive both in treasure and human lives and may not be the ideal treatment for the sickness that has befallen the organism. The strategic aerospace forces of ***2025*** will need to continue to learn, organize, and become better equipped to provide care to the global organism and if at all possible to prevent the violent clash that constitutes war. Carl von Clausewitz in his book *On War* states, "War never breaks out wholly unexpectedly, nor can it be spread instantaneously."[5] There are opportunities to avoid force-on-force conflict and they must be maximized in the year 2025. Strategic forces will be used in the year 2025 much as an acupuncturist uses needles to influence the body's central nervous system to maintain the balance of the human organism. Broadening our focus on high technology and systems to emphasize strategy and the art of warfare will ensure that our strategic aerospace forces are effectively employed daily to productively shape the ever-changing global system.

Our strategy and doctrine for ***2025*** must be sound. History is replete with actors assuming they possess either the ultimate in strategy or a weapon that provides an impenetrable shroud of invincibility. The French provide a fine example of the doctrine of static warfare becoming dogma between the world wars. The

French doctrine of methodical battle stressing firepower was inadequate to overcome the mobile battle of *Blitzkrieg.*[6] Assuming the next war would be like the last, France poured millions of francs into building the Maginot Line and creating a mobile reserve force to rapidly move to forward positions in Belgium while leaving the area bordering the Ardennes forest lightly defended.[7] French organization and command and control were predicated on the Germans' conducting another version of the 1914 Schlieffen Plan.[8] The French believed the Maginot Line was impenetrable and would keep invaders from the East off French soil forever. The Germans saw the Maginot Line as simply an obstacle that if avoided would be unable, unlike an army, to pursue them as they drove to and secured the Channel. Six weeks after the start of "Plan Yellow", the whole of France fell, only years after the end of World War I and the French celebration of victory over Germany.[9] This history lesson suggests that dogmatic adherence to doctrine, weapon systems, organizational structures, service obligations, or even thought processes will make our aerospace forces vulnerable to an adversary today and even more so in the year 2025.

A Perspective

This paper presents a perspective of strategic warfare that challenges the status quo. The following chapters aim to show the differences and similarities between 1996 and ***2025*** that we can expect to find in the future. To understand the role of strategic aerospace in the year 2025 we will begin by examining the joint doctrine of 1996. With this foundation we will leap forward to ***2025*** and examine the world of the future that we must begin to prepare for today. This vision of ***2025*** will highlight the changes in personnel selection and training, organizational structures, and planning tools that may be required to effectively operate in the global system supporting United States objectives.

Notes

[1] Dr James A. Mowbray, "Air Force Doctrine Problems: 1926 - Present," *Airpower Journal* 9, no. 4 (Winter 1995): 25–26.

[2] The United States Strategic Bombing Survey, Summary Report (European and Pacific War), 1945; reprinted in *The United States Strategic Bombing Surveys (European War) (Pacific War)* (Maxwell AFB, Ala.: Air University Press, 1987); Herman L Gilster, *The Air War in Southeast Asia: Case Studies of*

Selected Campaigns, (Maxwell AFB, Ala., Air University Press, October 1993); and Thomas A. Keaney and Eliot A. Cohen, *Gulf War Air Power Survey Summary Report,* (Washington, D.C., 1993).

[3] The Strategic Aerospace Warfare Study (SAWS) panel commissioned by General Fogleman, chief of staff of the Air Force, also tackled the question of strategic warfare in 2025. Their yet unpublished paper proposes the nation-state will still be the predominant actor in ***2025*** and strategic aerospace warfare will take place between nation-states.

[4] Col Richard Szafranski, USAF, "Neocortical Warfare? The Acme of Skill," *Military Review,* November 1994, no. 11, 43.

[5] Carl von Clausewitz, *On War,* ed. and trans. Michael Howard and Peter Paret (Princeton, N.J.: Princeton University Press, 1976), 78.

[6] Robert A. Doughty, *The Breaking Point,* (Hamdon, Conn.: Archon Books, 1990), 325.

[7] Doughty, 11.

[8] Ibid.

[9] Doughty, 331.

Chapter 2

The World of 1996

Today's joint doctrine considers strategic targets to be those things that support the adversary's capability to meet his strategic security objectives. The types of things targeted today may include the adversary's infrastructure, energy production, transportation, and command and control networks. The mission of today's strategic aerospace forces is to conduct operations to influence these target sets in attaining theater objectives that support our national security strategy.

Today's joint doctrine divides war fighting into three levels of combat operations: strategic, operational, and tactical. Though clear boundaries are not delineated, the levels are based upon their contribution to achieving the specific level's objectives.[1] The levels attempt to link strategic objectives with tactical action. Figure 2.1 represents the current joint doctrine divisions of warfare.

Figure 2-1. Current Joint Doctrine Levels of War

Actions in these three levels are many times planned, prepared, and executed with very different emphasis on size, scope, and importance. This division of objectives has met with varied success throughout history with many tactical victories leading to strategic defeats.

Sitting Bull led the Sioux and Cheyenne Indian nations to an overwhelming tactical victory over Lt Col George Armstrong Custer at the battle of Little Big Horn. What Sitting Bull did not foresee was the tactical action taken could magnify into a strategic defeat. Public outcry from the East demanded prompt reparation for the "massacre." The unintended result forced upon the Indians was an unexpected move to reservations in Missouri. Sitting Bull was forced to flee to Canada and lost the ability to negotiate a fair settlement to the conflict. The Sioux and Cheyenne lost their homeland.[2]

Levels of Operation in 1996

The strategic level of aerospace warfare is conducted against those resources that have been identified as supporting the ability of the adversary to meet his strategic objectives and goals. The operational level links the tactical employment of aerospace forces with the strategic objectives. The tactical level focuses on the engagement of aerospace units in combat.[3]

Today great care is taken by planners to develop strategy from national policy. As the strategy flow from the strategic to the tactical level it increases in detail and focuses on the cause-and-effect relationships that are required to produce the desired end state in the operational area. The narrowing of focus is necessary in the current organization of the military to direct forces for employment. Theoretically, all actions down to the tactical level support the strategic theater objectives and the strategic objectives are known and understood throughout the theater of operation. However, in practice, tactical orders such as the air tasking order (ATO), do not clearly delineate the strategic aims supported by the tasking. A planner somewhere in a planning cell understands the causal relationship; the fighter in theater most likely does not.

Planning in 1996 uses cause-and-effect modeling to determine the desired courses of action to take in conducting an operational campaign. An example of this modeling is the Warden five-ring model.

The Warden five-ring model describes the enemy as a system.[4] The system is broken into five different categories: Leadership, System Essentials, Infrastructure, Population, and Fielded Forces. Information has been suggested as the "bolt" that holds the system together. War is conducted by precisely attacking critical nodes supporting the centers of gravity (COGs) identified in the rings of the enemy system causing catastrophic effects and reducing the ability of the enemy system to operate effectively. The aim of warfare in this theory is not focused directly on the enemy's fielded forces or even the strategic intentions of the enemy leadership. Instead Warden's five-ring approach by creating paralysis attacks the ability of the enemy system to effectively operate and project power. Paralysis is created by shocking the enemy system with synchronized attacks throughout the system's structure (parallel attack). The leadership is not affected directly because it is usually well protected. Success and imposition of our will on the adversary are attained by threatening the adversary's continued existence as a modern industrialized nation. With no capability remaining to reconstitute, the enemy system collapses. It is truly a form of "death by a thousand cuts."

The five-ring theory clearly demonstrates the linear cause-and-effect processes that are used today to plan engagements. Because the world is not linear, the cause-and-effect relationship will eventually break down. When this happens a disconnect will occur between the desired strategic objective and the lower-level operational and tactical objectives. To help overcome this shortfall and win the engagement conclusively, the strategic, operational, and tactical levels must be simultaneously attacked and the enemy nation effectively destroyed. This was how this nation fought in the historical conventional engagements of this century: World War I; World War II; Korea; Vietnam; and Operation Desert Storm.

Today using the three levels of warfare philosophy, the war is won by holding the continued existence of the adversary's nation at risk. Over the years this philosophy has worked with varied levels of success. It is arguable whether our most recent engagement in Operation Desert Storm was successful. Five years and many millions of dollars after hostilities officially ceased, our presence in the region is still required and Saddam Hussein is still influencing the global community.[5] It seems our victory fell short of Warden's claim that strategic paralysis of the enemy system would lead to the changing of the enemy leadership's will.[6] It is important to not disregard the lessons of history as the theory needed to operate effectively in the year 2025 is developed.

Notes

[1] Joint Publication (Pub) 3-0, Doctrine for Joint Operations, 1 February 1995, ix.

[2] *Encarta 95,* 1995 ed., s.v. "Sitting Bull."

[3] Joint Pub 3-0, II-3.

[4] Col John A. Warden III, "Air Theory for the Twenty-first Century," in Barry R. Schneider and Lawrence E. Grinter, eds., *Battlefield of the Future: 21st Century Warfare Issues* (Maxwell AFB, Ala.: Air University Press, September 1995), 107–8.

[5] On the five-year anniversary of the end of Operation Desert Storm Saddam Hussein held a victory celebration. Though his country is a disaster and remains under an economic embargo, Saddam's influence and power is still felt in the region. Employment by Saddam of weapons of mass destruction is still a concern in the region.

[6] Warden, 104.

Chapter 3

The Vision of Strategic Aerospace Warfare in 2025

Alternate Futures

Alternate futures or scenarios illuminate the challenges that will be faced in the future. The alternate futures of ***2025*** bound the future that could actually exist. Bounding the problem is much like the quantum description of particles within an atom. We do not know exactly where the particle is at any given time, but we do know the boundaries within which it exists. Examining the boundaries and understanding the themes common in the alternate futures planning space suggests an effective means of organizing, planning, training, and equipping of forces to meet the challenges posed in the year 2025.[1]

The alternate future scenarios developed in the ***2025*** study suggest the future will involve many different interconnected actors. The landscape of ***2025*** may be dominated by one, two, or many actors and these actors may even take the form of nonstate entities. The overall system will be complex, and even the smallest actor could wield some amount of influence upon the global system. It is accepted that even in ***2025*** much of the general population of the world may still not have access to communication systems and decision-making processes within their entities. Even so, the leadership of most of these organized entities will. Understanding the effect of knowledge transfer systems upon the global system is the key to successful prosecution of strategic warfare in ***2025***.

As knowledge transfer systems (such as intelligence nets, commercial satellite imagery, Internet, global news networks) expand, all leaders in the global community of ***2025*** will have access to information in near realtime. As a result, the boundaries between the current strategic, operational, and tactical levels of warfare

will begin to fade. This continued blurring of the already indistinct divisions of the classical levels of warfare leads to a situation where eventually all military action will have a measurable strategic impact on the adversary leadership's decision-making processes. The pervasiveness of information and knowledge available to the enemy must be exploited and incorporated into the planning, preparation, and execution of all military actions to shape the strategic response of the global system.

The *2025* Vision

In the world of ***2025***, strategic aerospace forces may be called upon by our national leadership to provide flexible options for influencing the global environment. The following items stand as landmarks that will challenge our nation's aerospace forces in the year 2025.

- The global game board in ***2025*** will be very crowded and interconnected.
- Unpredictable nonlinear response to strategic influences will be experienced because of the rapidity of multiplexed feedback within the global system.
- Understanding the feedback processes will be crucial to accurate prediction of results. Outcomes will be influenced more by the type and condition of the feedback present than the degree of complexity or the number of variables in the system.
- The nation-state will not have a monopoly on influence and power. Whether ***2025*** is uni-, bi-, tri-, or multipolar, influence and power promoted by even small actors will reverberate throughout the global system.
- Information will dominate the global landscape with rapid cycle times measured against the speed of light. Much of what we see today, we will continue to see in ***2025*** just one million times faster.

Strategic aerospace warfare in ***2025*** will do much more than shape the battlefield; strategic aerospace forces will be used to shape the global system. In ***2025*** all things must be measured against the effect they will have on both the adversary leadership and the global system. An almost prescient application of aerospace forces will be required to ensure our desired endstates are attained without upsetting the delicate balance of the global system. Good situational awareness of the global system must be maintained to prevent

military action from creating undesired effects and subsequent vulnerabilities that could be exploited by an adversary.

The world of ***2025*** is full of strategic dangers and pitfalls. In an era of declining defense spending, aerospace systems must be acquired that will effectively influence and harmonize the global system of ***2025***.

Harmony Amidst Cacophony

Success in ***2025*** will require the United States to redefine "winning." War in ***2025*** will be even more difficult to fight as a zero-sum game with a clearly defined winner and loser. In ***2025*** successful methods to win will need to embrace as much as possible a win-win philosophy. Harmony is a concept that addresses this desire.

The many external and internal factors that may influence the global system in ***2025*** create a vision that could be characterized as a cacophony. Even the alternate futures dominated by a single nation-state or nonstate actor will be interconnected such that even small actors and their influence must be considered when examining the global system as a whole.

An illustration of a cacophony is a symphony orchestra before the beginning of a concert. With no direction from the conductor each instrumentalist (actor) is playing his own tune (following his own objectives). To an observer the sound generated at this point is discordant and very noisy. Upon the direction of the conductor (currently our role as the world's sole superpower) each instrumentalist provides his contribution to the piece in harmony with the other players in the orchestra. This action, under the direction of the conductor, creates a composite sound from the orchestra (global system) that is in balance. Note that the harmony and richness of sounds of the different instruments blend to create a sound that is more beautiful than if all played the exact same melody. For this reason the output of the whole orchestra is much greater than the sum of the individual instrument parts. Unfortunately it takes only one instrumentalist (actor) playing out of tune (bucking the conductor's objective) to create discord for all the others in the system. To be effective the conductor must capture the attention of all the instrumentalists and demonstrate the mutual benefits that can be enjoyed by all as they follow the conductor's leadership. Certainly this example does not propose that the US dominate the global system to the point of removing the individual sovereignty of the

various nation-state and other actors. Rather, it is suggested that effective leadership must be performed in the global system to mold an environment that is mutually beneficial for all involved.

The world of ***2025*** will be full of challenges as the US seeks to interface successfully in the global arena. Careful understanding of strategic effects will allow aerospace forces to be used effectively to maintain harmony in the global system. Lack of understanding of strategic effects in the application of aerospace forces could lead to disaster.

Chaos or Nonlinear Response

How do we prevent our adversaries from responding differently from the way we desire? Chaos has been considered as a possible solution to the dilemma of predicting the response of the global system to strategic influence. Can chaos understanding be used in this situation to help us predict the unpredictable? Maj Bruce DeBlois in his paper *Deterministic Philosophical Assumptions in the Application of Chaos Theory to Social Events* shows that chaos is applicable to only deterministic systems. Chaos as a science may not be applied to a nondeterministic system. Social systems (at least those considered to be desirable) include the human element of freewill and are therefore non-deterministic.[2] This means unpredictable nonlinear response can be expected from the interconnected global system and chaos theory will not help predict the results. Understanding the nonlinear global system's reaction to influence must be the focus of our planning and employment of strategic aerospace forces in ***2025***.

Nonlinear Systems and Strategic Analysis

The decision-making process used by planners must be balanced to ensure information derived from linear modeling and simulation does not over influence the acquisition of and decision to use certain types of weapons systems. James Polk has suggested that in some cases, "we have been led astray by computerized wargames . . . because the primary determinant of victory in these exercises is a preponderance of firepower [not the subtleties of human will]."[3] The focus in determining the proper influence to apply is dependent on the contextual elements of the adversary, the predicted reaction of the adversary to the applied influence, and

the predicted second order effects on the global system. These all must be predicted as accurately as possible using nonlinear techniques including the genius of intuition.

The pinball machine is perhaps a good illustration of planning and applying appropriate and inappropriate influence on a system. In a pinball machine a steel ball is shot to the top of a ramp comprised of a matrix of bumpers, pads, rails, and other obstacles. As the ball rolls down the ramp it is influenced by Newtonian physics and the obstacles it comes into contact with. Some obstacles take energy from the ball, some add energy. The path the ball takes is the result of the influences upon it. For an element to have influence (change the path of the ball) the ball must come into contact with it. A decision path of a notional leader is shown in figure 3.1 below.

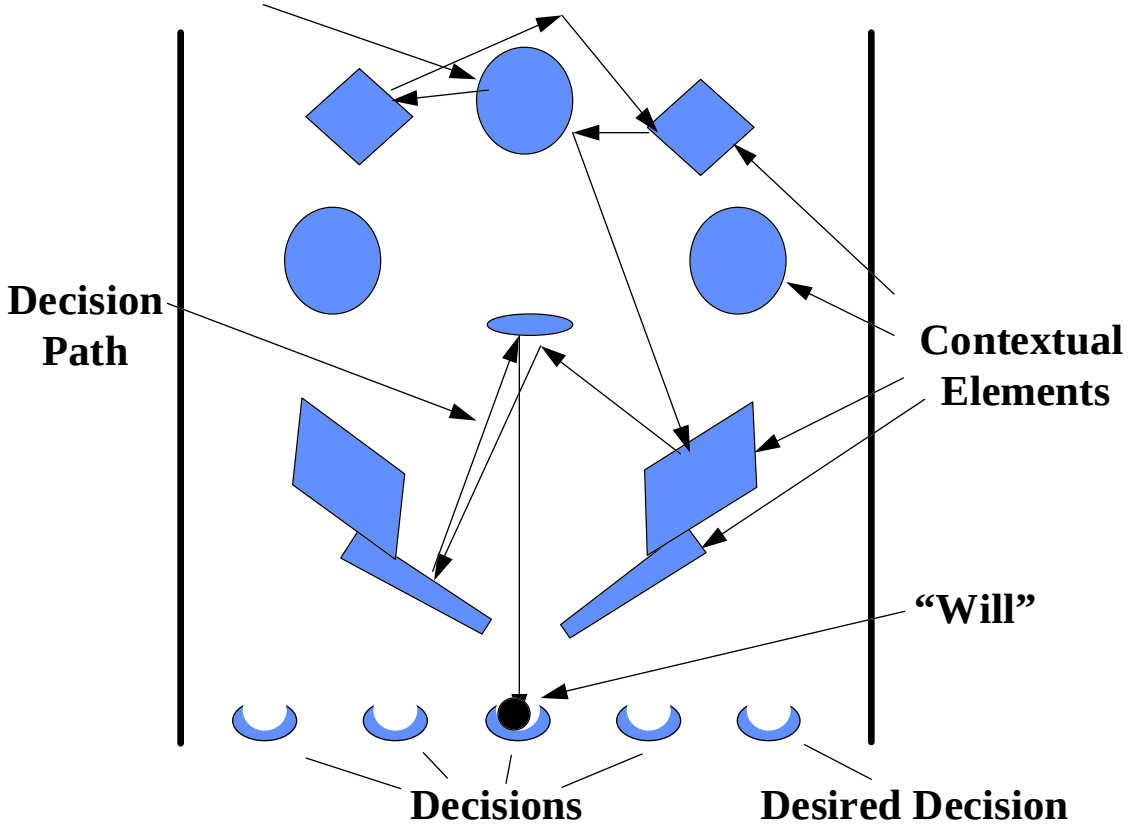

Figure 3-1. The Pinball Machine

The ball in this example represents the "will" of the adversary's leadership during one decision cycle. The ball contacts various obstacles that represent the various contextual elements within the adversary's system in its journey down the ramp. The will of the leadership is influenced by the contextual elements

within the system. As illustrated below the effect of the contextual elements upon the decision process can change as the priority of values change (such as the different values displayed by leaders in war versus peace) and as external factors such as information are added and subtracted from the system.

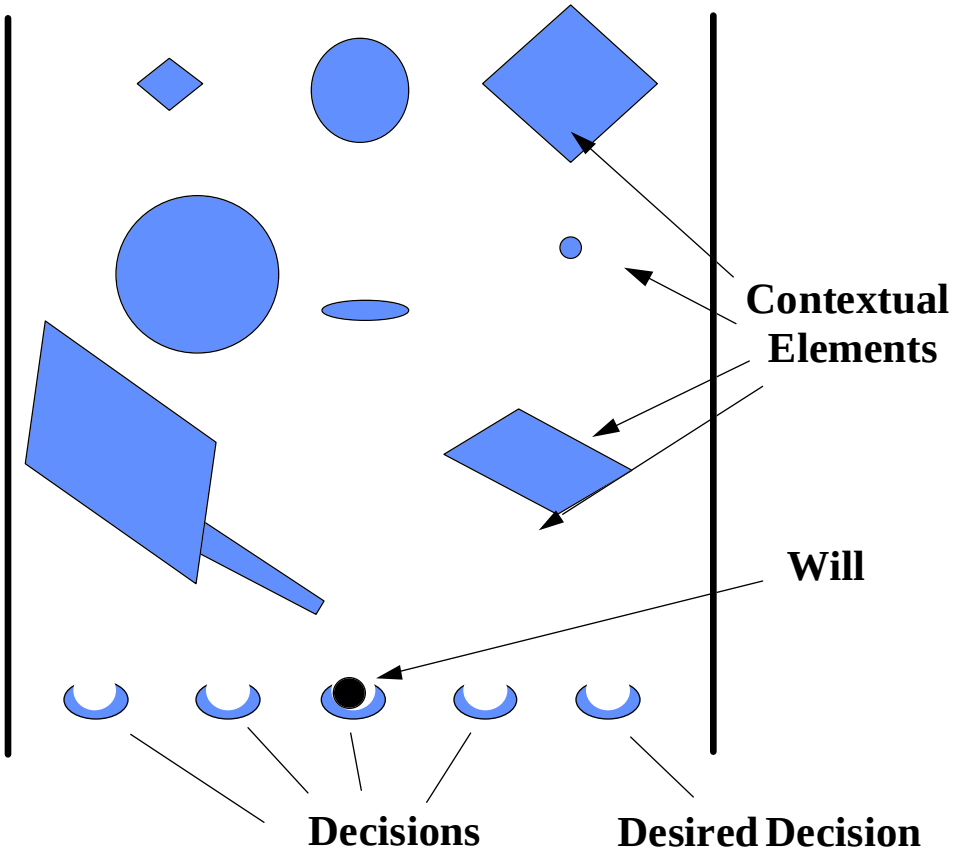

Figure 3-2. The Pinball Machine with Influence Added

By understanding the contextual elements that are affecting the adversary's decision process and applying the appropriate influence (in this example by adding/removing or perhaps changing the power exerted on the ball by an obstacle), the will of the leadership can be directed to a more desirable conclusion (as defined by our own national security policy). The inappropriate application of influence in this system would be

1. influencing contextual elements that are not considered by the enemy leadership,
2. adding or subtracting too much energy and deflecting the will away from the desired result, and
3. creating problems equal to or greater than those we are attempting to resolve through second order effects on the global system.

As defined by Clausewitz, the focus of military action is on the will of the enemy leadership.[4] Notice in this example that there are no levels of engagement (e.g., strategic, operational, tactical). What really matters is the effect of the action on the enemy leadership's decision cycle. This suggests that in ***2025*** no action at any level of warfare should be undertaken without regard to its expected influence on the will of the enemy leadership.

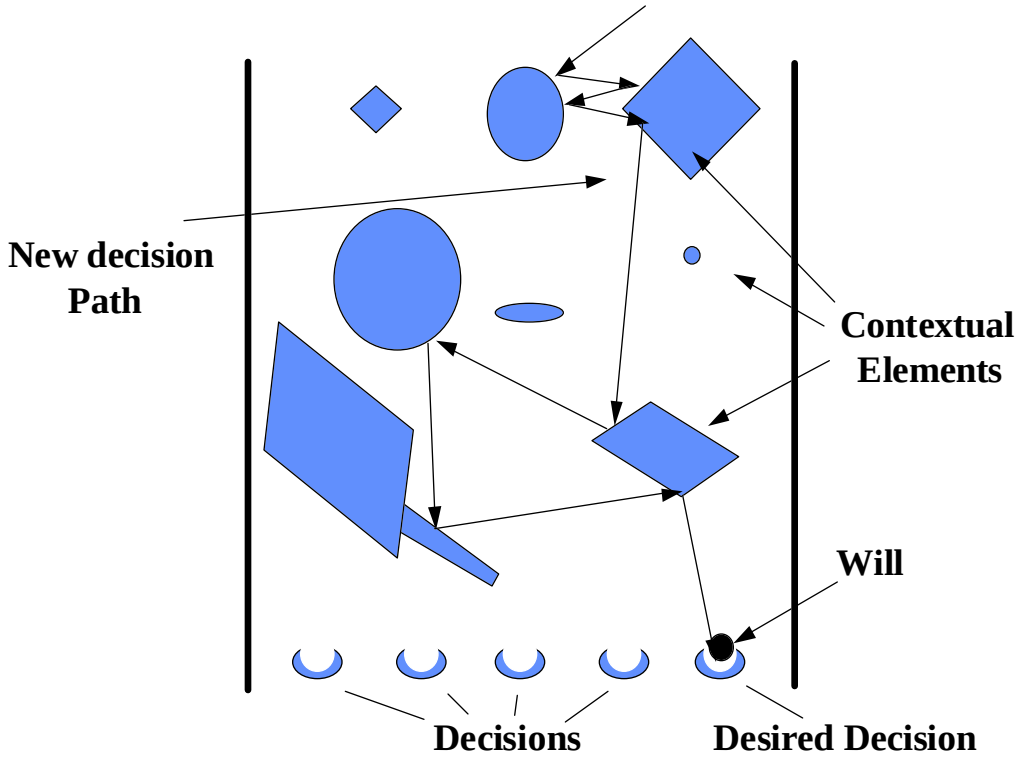

Figure 3-3. The Pinball Machine with a New Decision Path Defined

Due to the human element, it will always be impossible to determine and predict every potential response an adversary will have resulting from a strategic influence. Preparation and training must accomplished to maximize the understanding and correct identification of the contextual elements that may influence the will of the adversary's leadership. Correct prediction will prevent surprise and unnecessary bloodshed.

The world of ***2025*** will require both subtle and sometimes severe influence to direct the adversary leadership's will to harmonize with our desired endstate. To recap from the previous illustration, proper influence of the leadership's will in ***2025*** will require

1. that the influence used will affect the leadership's will,

2. that the influence used will properly deflect the enemy's will in the direction of our desired endstate, and

3. that the use of the influence will not create any undesirable (defined by our policy) secondary effects on the rest of the global system.

War is a two-way street. Influence applied to an adversary must be done while protecting the contextual elements that will influence our own nation's leadership.

Formlessness

We must protect our nation's vulnerabilities by using deception as Sun Tzu suggests to appear distributed and formless to any adversary.[5] On the road to ***2025***, technology must not drive the acquisition decision process. The temptation is great but it must be resisted to ensure that technology does not create systems that are easy targets for a motivated adversary. The development of monolithic systems and the creation of force capabilities around them makes aerospace forces vulnerable to the enemy's influence. In the year 2025, our forces must be flexible enough to influence the varied contextual elements of the adversary's leadership or they will be ineffective. Strategic aerospace forces must be capable of changing rapidly to adapt and apply influence to the changing contextual elements of the adversary.

Single Level of Operation in *2025*

In the year 2025, daily activity will require planning and prediction to assess the effects of influence on the global system. This is not to say every action in the world will have a strategic effect, but rather, every action may have an effect and an effort should be made to understand and direct the outcome. The key to the interconnection of the global system, as previously stated, will be information.

Information will create a metaphysical relationship between all the global actors. Since the leadership within the global system will have access to many varied sources of information, each military action will have the potential of affecting the contextual elements that influence the leadership's expression of will. The Cable News Network (CNN) factor has already shown its enormous power to influence. Some cases in

point: During Operation Desert Storm, CNN televised a multitude of coalition attacks against Iraqi forces and other targets. It is very likely these images and the knowledge that the whole world was seeing them influenced Saddam. The CNN images certainly seemed to influence our own leadership. President Bush's decision to end the ground campaign after 100 hours was driven by the desire to prevent unnecessary slaughter and images of the unbelievable destruction on the "road of death" leading from Kuwait back to Baghdad from appearing on CNN and affecting the solidarity of the coalition. This decision allowed the Republican Guard to escape to the north (maybe in retrospect the wrong thing to let happen), but it kept the coalition together (at the time maybe a greater concern). In a more recent example, there were no forces in Somalia that could have stood against the US forces deployed there in 1994. The images on television of a dead US Army Ranger being dragged through the streets created an large public outcry in the US. Two weeks later the US withdrew from Somalia. This result probably exceeded all expectations of the Somali warlords who directed that incident. It is a good example of the effect information has today on the leadership's will and the fusing of the levels of warfare into one. In other words, a strategic goal resulted from a tactical action. It may be helpful to view the effect of information upon any event in ***2025*** as shown below.

Event + Effective Application of Information = Appropriate Strategic Effect

or maybe even

Event * Effective Application of Information = Appropriate Strategic Effect

In any case information is a factor that must be considered and used in the application of military power to create strategic effects and influence the will of the adversary's leadership.

The *2025* View of Warfare

In the year 2025 successful application of all aerospace forces (since every aircraft, satellite, acquisition decision, etc. might have a strategic influence depending on the adversary) will be conducted with the intent of obtaining the appropriate strategic effect while maintaining the balance of the global system. Information Dominance is the key to proper employment of the 1996 aerospace functional concepts of Global Awareness, Global Reach, and Global Power. As illustrated below, it is information in ***2025*** that will allow aerospace power to create strategic influences that effect the adversary leadership. Further explanation and

development of the functional concepts of Global Awareness, Power, and Reach are contained in appendix A.

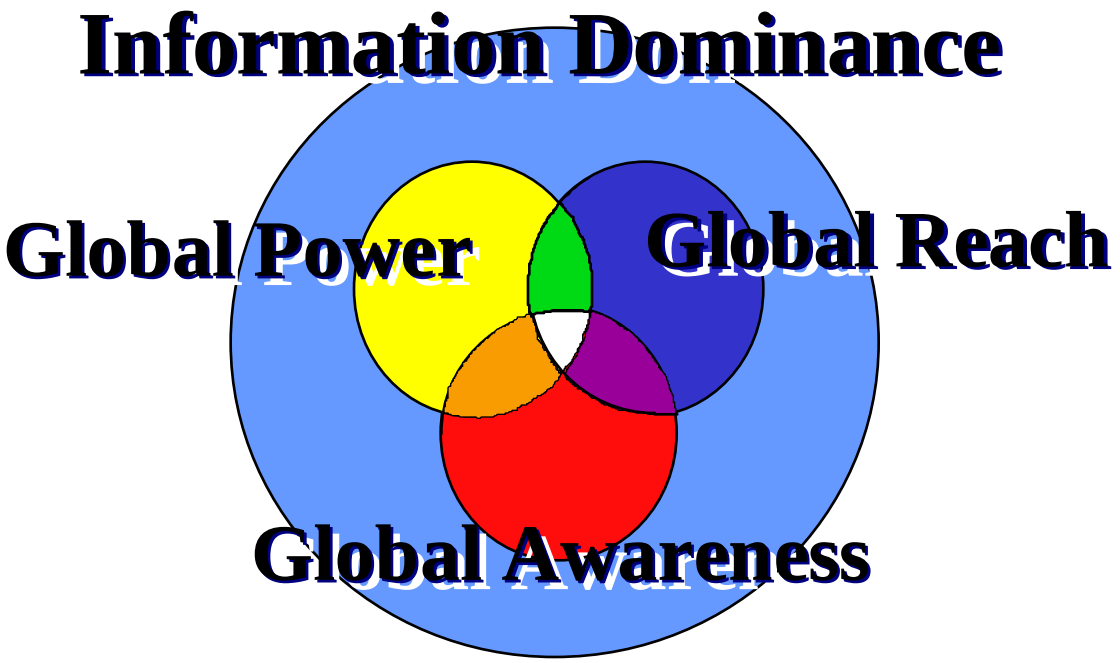

Figure 3-4. The 2025 View of Warfare

Successful operation in the year 2025 requires understanding and acceptance that even the most mundane items may have great strategic impact. Even today information magnifies small actions into large effects, such as the criminal actions of a few sailors and Marines in Okinawa, which threaten the continued basing of US troops on the island.[6] The subtleties of influence will define the world of 2025. Effective exploitation of information will allow aerospace forces to meet the challenges of the future.

Notes

[1] Alternate futures were developed by the ***2025*** study team using creative thinking techniques. The alternate futures that were developed describe the extremes that could exist in the year 2025. Further information on the ***2025*** alternate futures can be found in the yet unpublished white paper, *Alternate Futures for 2025*.

[2] Maj Bruce M. DeBlois, *Deterministic Philosophical Assumptions in the Application of Chaos Theory to Social Events*, Unpublished paper, (Maxwell AFB, Ala.: School of Advanced Airpower Studies).

[3] Quoted in Chet Richards, *Modeling and Analysis or Strategy and Decision?*, (Marietta, Ga.: Lockheed Corporation and The Georgia Institute of Technology, 1991), 1.

[4] Clausewitz, 75.

[5] Sun Tzu, *The Art of War*, trans. by Samuel B. Griffith (London: Oxford University Press, 1963), 66–67.

[6] "U.S. will give back some Okinawa land," *The Montgomery Advertiser*, (The Associated Press: Monday, April 15, 1996), 4A.

Chapter 4

The Strategic Decision Maker in *2025*

In the year 2025 our forces will operate in an environment much different from today. All operations (training, exercises, deployments, force application) will insert power into the global system causing shifts in the balance of power and a resulting system response. Daily aerospace activities will be used to maintain or upset the balance of the global system and project power to guide decision-making processes. Idealistically, proper application of power will create true harmony within the global system. Realistically, strategic influence will be required daily to fix yesterday's problems, while creating tomorrow's problems. This chapter addresses three areas, that if concentrated on today, may in the next few years provide a strategic force more capable of successful influence in the year 2025. The areas of focus proposed are training, organization, and planning.

Training for Strategic Understanding

As previously discussed, the global system will be characterized as nonlinear but not chaotic due to its nondeterminant nature. To effectively operate in the world of ***2025*** all aerospace force leaders' training must increasingly emphasize the art of war. The focus on the "soft" ideas of persuasion, agility, subtlety and influence as found in Sun Tzu and "fog and friction" espoused by Clausewitz will help personnel understand and influence nonlinear systems. Training with simulation as done today is very cost-effective, but in simulation it is extremely difficult to insert the human element or moral factors described above.[1] Mathematical limits are imposed on computers by Godels theorem and the Church-Turning thesis that will prevent a simulation from ever being able to completely replicate the human mind. [2] War will always

remain an art. The focus on high-technology weapons systems must not be allowed to cloud the creative critical thinking of aerospace personnel to make accurate and sound strategic decisions on the application of strategic influence.

The environment of ***2025*** will require a special kind of officer, planner, and leader that can view and understand the global system and manipulate influence to direct the will of the various actors that make up the system. Just as pilot training selects individuals with certain demonstrated qualities to fly fighters instead of transports (or vice versa), individuals who have the ability to think and make correct strategic decisions in a nonlinear environment must be selected to monitor and influence the global system.

This idea of a notional planner/strategic decision maker, leads to the creation of a leadership corps. Much like the Prussian General Staff, individuals with demonstrated potential early in their career (two to four years) should enter specialized training to increase their abilities to judge and influence nonlinear systems in preparation to become members of the planning staff. By the time these individuals reach the 15-20 year point they should be experts in the operational art of warfare. The key characteristics of the leadership corps should be the ability to quickly synthesize information and the ability to rapidly choose a course of action that correctly influences nonlinear systems without upsetting the balance of the larger system. The individuals comprising the leadership corps should be trained to measure, understand, and guide the global system using the appropriate application of the military instrument of power (in conjunction with the other instruments of power) to maintain harmony. Those who are unable to effectively operate in this complex environment should be moved out of the leadership corps.

Organizing for *2025*

In the year 2025 the organizational structure used by aerospace forces must be optimized to both plan and direct proper influence upon our adversary's leadership. The proposed highlights of this future organization are

1. innovation and awareness that allow seamless planning and simultaneous execution within the theater and subregion of operations,

2. adaptability and flexibility to transform the organization to effectively meet the posed challenges,

3. nearly instantaneous feedback after influence is applied to understand the adversary's new or continued strategic intent, and

4. a distributed and dispersed network to create invulnerability.

The function of any organization is to maximize the capabilities of the individuals who are assigned to it. The organization created for ***2025*** must maximize the leadership corp's ability to direct global influence. Effectiveness in the year 2025 will be somewhat proportional (due to the nonlinearity of the system) to our ability to dominate the information spectrum. According to Alvin and Heidi Toffler, "a revolution is occurring that places knowledge, in various forms, at the core of military power. In both production and destruction, knowledge reduces the requirements for other inputs."[3] The function of the ***2025*** military organization will be the management and application of knowledge. Knowledge is different from information in that it has been processed. Information becomes knowledge when it is received, understood, and been provided a measure of significance to be used by the rest of the organization.

To effectively manage knowledge, organizations must be as flat as possible, and staffed with creative thinkers. Combining the staffs that organize, train, and equip with the war fighting staffs would maximize efficiency in properly assigning influence since the decision to conduct or not conduct an exercise next to an adversary's country might be more effective in directing the will of the adversary leadership than dropping a bomb. Remember, everything in the year 2025 can have a measured influence on the global system if it has an effect on the will of our adversaries. So it doesn't make sense as we prepare for ***2025*** to continue to separate these functions. The same staff that creates and measures strategic influence must also organize, train, and equip. Some ideas and proposed changes to today's organizational structure that will prepare the Air Force to meet ***2025*** are contained in appendix B.

Knowledge must be shared easily internally and externally to the organization. Some type of low-level artificial intelligence may help route knowledge throughout the organization to the proper decision makers without excessive time delays or human intervention. This will enable the sharing of knowledge without time lost interpreting or translating. With knowledge available and decision makers properly trained, the planning staff of ***2025*** is now ready to plan.

Planning in *2025*

"Strategic" targets in the year 2025 are a function of the contextual elements that influence the decision-making capability of the adversary's leadership. They may or may not correlate to the western standard ideas of: petroleum, oil, and lubricants distribution and storage areas, electric, C3, and so forth. It is entirely dependent on who and what makes up the adversary's leadership decision making process, what influences the will. To clearly understand the appropriate influences to undertake, we must know what makes our adversary tick. What do they hold to be ground truth? What do they hold close? How do they perceive the United States? How do they regard world opinion? Where are they vulnerable? The answers to these questions will result in a strategic plan. Combining the strategic vulnerabilities of each global actor with our own vulnerabilities and capabilities will provide a vision of the global system. With this vision and understanding we can more effectively influence the global system to maintain harmony. This task is enormous. To properly accomplish it we must create organizations and tools to support our leadership corps decision making process.

As noted by Sun Tzu, success is more likely attained when we know both our enemy and know ourselves.[4] By thorough examination of both the contextual and operational elements in each region and effective measurement of the effects of previous influences applied we may be able to more accurately model the boundaries of the nonlinear global system.

So where should strategic aerospace warfare be planned? Is this purely a national command authorities (NCA) or a Department of Defense (DOD) function? Is it a function of Intelligence? Where exactly should strategic analysis be accomplished? This question has been haunting aerospace planners since the inception of airpower. Lt Col Donald Wilson, while serving as director of the Air Strategy and Tactics department of the Air Corps Tactical School ACTS in 1939, directed that students be informed, "of the necessity to carry intelligence work far enough to provide a detailed analysis of objectives and targets within those objectives." Maj Muir S. Fairchild, who taught the national economic structure course, took a different view by stating that gathering complete information concerning targets was, "a study for the economist, statistician (or) technical expert, rather than the soldier."[5] For over 50 years we have been depending on experts outside the DOD to determine what we should influence. This has been ineffective in providing information to the war

fighter in a timely manner to properly apply strategic influence. The leadership corps, as experts in the operational art, must be able to effectively measure and control the influence upon the global system.

But who is going to perform the functions of this strategic analysis? This function should be performed at the theater level, with interaction to a national-level agency that would provide a global view. To properly understand and truly create knowledge from the tremendous amount of information that is available in the year 2025 we propose the creation of a strategic decision support system.

Strategic Decision Support System

To achieve a time-limited response capability and reduce our decision cycle time, a planning and measurement system must be designed to effectively analyze and support the leadership corp's decision process. In the year 2025 the use of societal models must be used to understand and predict the consequences of our day-to-day military operations, as well as our crisis response.

A streamlined decision-making process should emphasize knowledge flow. The leadership corps must be able to rapidly identify capabilities and requirements necessary to deal with any situation that may arise and direct the proper influence to be applied. This type of decision support system will be required to effectively reduce our observe-orient-decide-act (OODA) loop[6] and provide a framework for appropriate decisions.

As influence is applied, the leadership corps must be able to effectively monitor and assess the global strategic impacts of the influence. There must be a feedback into the strategic decision support system framework that allows timely review of the impacts and creation of new decisions based on the new knowledge.

Again the concepts of Godel and Church-Turning demonstrate that, "human understanding can not be an algorithmic activity."[7] Machines will never have the intelligence to replace the human mind. But, machines do provide effective analytical tools to support decision making. Albert Clarkson in his book, *Toward Effective Strategic Analysis*, argues that computer systems are important analytical tools because they don't forget history and are free from operator bias.[8] How often has history been repeated? Proper design and application of a strategic planning system will result in successful application of aerospace power in the year 2025.

[1] Chet Richards, *Modeling and Analysis of Strategy and Decision?* (Marietta, Georgia: Lockheed Corporation and The Georgia Institute of Technology, 1991), 11.

[2] Rodger Penrose, *Shadows of the Mind* (New York, NY: Oxford University Press, 1994), 51.

[3] Alvin and Heidi Toffler, *War and Anti War: Making Sense of Today's Global Chaos*, (New York, New York: Warner Books, Inc.), 80.

[4] Sun Tzu, *The Art of War*, trans by Samuel B. Griffith (London: Oxford University Press), 84.

[5] Lt Col Thomas A. Fabyanic, *Strategic Air Attack in the USAF*, Research report no. 5899 (Maxwell AFB Ala.: Air University Press, Apr 1976), 41.

[6] Maj David S. Fadok, *John Boyd and John Warden, Air Power's Quest for Strategic Paralysis* (Maxwell AFB, Ala.: Air University Press, February 1995), 16. OODA stands for Observe, Orient, Decide, and Act and has been developed by John Boyd to explain the process that is necessary to effectively engage and defeat an opponent. If you can operate your OODA loop faster and more accurately than your opponent can operate theirs you will gain a decisive advantage that will lead your opponent to confusion and defeat.

[7] Rodger Penrose, *Shadows of the Mind* (New York, NY: Oxford University Press, 1994), 51.

[8] Albert Clarkson, *Toward Effective Strategic Analysis* (Boulder Colo.: Westview Press, 1981).

Chapter 5

Conclusions and Recommendations

The world of ***2025*** will be complicated and challenging. Knowledge transfer networks will interconnect the global system causing it to react much like a single, large organism. Strategic aerospace forces can be used preventively to influence and maintain the balance and harmony of the global system.

2025 will have only one level of warfare–the strategic level. Strategic aerospace forces will be used to influence the will of the adversary's leadership. All action will have some measurable effect due to the impact of information on the contextual elements that makeup the leadership's decision-making process.

Now is the time to begin to prepare for the future of ***2025***. To successfully influence and maintain harmony in the global system of ***2025*** our aerospace forces must

1) Recognize the world as a single system. The vision and decision making processes used by strategic aerospace forces must be expanded from a regional to a global understanding.

2) Recognize the strategic impact that our day-to-day operations and decision making have on the global system. Daily decisions must be measured and gauged by their influence on the global system.

3) Create a leadership corps to be the expert practitioners in the art of war.

4) Reorganize for efficiency and creativity. Organizational structures must be flattened to maximize the interchange of knowledge and the potential of the leadership corps.

5) Pass the decision responsibility for both war fighting and organizing, training, and equipping to the same location. This will take advantage of all action having a measurable influence on the global system.

2025 will present the United States with many challenges. Strategic influence will come in many forms and varieties. The knowledge organizations will be necessary to function successfully in the future global

system and must be created now. Vision, organization, and capabilities must change to insure the strategic aerospace forces of the United States are prepared to skillfully employ the art of war and continue to support the will of our national leadership.

Appendix A

Functional Concepts

Global Awareness

The futures of 2025 dictate a requirement for the United States to maintain information dominance. As the Internet and other means of communication make the world a smaller place, the need for near-real-time information processing (awareness) will be critical. With the global game board becoming more crowded and interconnected, the US must have the awareness to deal with all the variables that will make up the strategic level of war. Global Awareness is the ability to predict and measure the impact of aerospace forces on the global system.

The United States must be able to quickly assess situations and determine the appropriate response to each situation to meet our strategic objectives. To accurately assess a situation and determine the appropriate response, we must create officers trained in the subtleties of strategy and warfare. To help the decision-making process, technology must be employed to produce a system that supports the strategic decision-making process. This system must help planners accurately predict, by applying proper significance to the barrage of information overloading our systems, the strategic effects of any regional decision in a timely manner. By properly balancing the planners of 2025 with their tools, awareness and understanding of the global system can be created. That understanding will be used to reach and touch our adversary's decision processes.

Global Reach

Global Reach in the year 2025 is the ability of the US to influence an adversary leadership's contextual elements anywhere, at anytime. Aerospace forces are unique in that they have agility, speed, and range that allows continental US basing and still retains timely response to influence the adversary. Strategic implications of Global Reach include the ability to deny an adversary sanctuary, or the ability to cause disruption within an adversary's system by interjecting "force" into that system. To deny sanctuary, or to cause disruption within a system, an air force must have the ability to lift and project forces to areas of concern, and precisely insert and withdraw the required forces to accomplish the mission.

Deny Sanctuary

The ability to reach anywhere around the globe denies sanctuary to any potential adversary. "You can run, but you can't hide" is the primary theme for strategic aerospace warfare. In the year 2025 strategic aerospace forces will influence the complete spectrum of war from Military Operations Other Than War (MOOTW) to nuclear, biological, chemical (NBC) operations. In denying sanctuary, the adversary leadership must understand any potential strategic target can be "serviced" by aerospace forces. In the year 2025 physical sanctuary doesn't exist because of aerospace capabilities.

However, there are some potential shortfalls with the concept of sanctuary. The shortfalls that must be overcome may include political considerations, territorial integrity and neutrality, and "overflight" requirements.

Global Reach provides a means to reach and properly influence a strategic target. By "getting there" and exerting influence, the US achieves the desired impact on the adversary leadership's will. As an example, a terrorist base in a third party nation or territory may be considered a viable target and we must be capable of providing the correct influence if called upon by our NCA. Recent examples include Hezbollah terrorist's bases in Lebanon being struck by the Israeli Air Force. The dispute is not between Israel and Lebanon, but the territorial integrity of Lebanon must be violated for Israel to influence the "strategic" targets of the Hezbollah. Accordingly, the United States must be willing and able to work around the issue of territorial and airspace integrity of a neutral third party to deny sanctuary to our adversaries.

Lift Capability

Global Reach in the year 2025 is required to provide a global omnipresence that is achievable through both close and remote influencing. Close influence is defined as the projection of forces into the theater. Close influence will require lift that is fast, rapidly transformable, and capable of moving outsized articles. Remote influencing is defined as influence performed on things outside the theater and usually requiring support from other instruments of power. Both types of influence will be conducted through a wide range of means, all with the intent of guiding the adversary's leadership to harmonize their objectives with our own. Thus, conventional forces, in some situations, will still be required to forward deploy to meet our national objectives. In the year 2025 lift will still be provided by traditional aircraft, and possibly augmented with transatmospheric vehicles (TAVs) and ground-effect vehicles. In any case, strategic lift will remain the key element in providing global reach. Lift asset designs for 2025 must adhere to what they must transport. Thus the question: Who or what is going to require global transportation in the future?

Lift Capacity

The two major regional conflicts (MRC) posture used today will not work in the year 2025. ***2025*** will require the NCA to understand and influence tens, maybe hundreds, or even thousands of different nodes in the global system to maintain harmony. The NCA will use many different forms of influence, but many challenges will require the use of the military instrument of power. Military ground forces will continue to require transport to areas where their expertise is required. Deployment of Air Force assets and their logistics tail necessary to operate the platforms of 2025 will also require transport. The forces deployed and the items brought to the region will be measured in the overall effect they have on changing the adversary's objectives. We must continue to provide a lift capability to project strategic influence to far-flung regions of the globe.

Precision Insertion and Withdrawal

In the year 2025 equipment and personnel must be inserted and withdrawn precisely and timely. Lt Col John L. Cirafici, in his book *Airhead Operations, Where AMC Delivers*, proposes that,

> The ideal situation for the supported combatant commander is for his forces to flow into theater airheads timely and be positioned where they are needed so that units can quickly and effectively reconstitute in anticipation of employment . . . while arriving forces are insufficient or relatively immobile, they can be destroyed by an opposing force. The airhead that the theater commander relies on for rapid introduction of forces and equipment is by its nature an area of vulnerability and, potentially, a bottleneck.[1]

Global Reach must have the ability to insert and withdraw forces precisely to reduce the vulnerability of conventional "airheads" and eliminate the associated bottlenecks. Precision insertion and withdrawal gives the combatant commander the flexibility of providing influence where and when needed in the least amount of response time. It is only through effective Global Reach that we can even consider the application of Global Power.

Global Power

Power has been defined as "a psychological relationship between those who exercise it and those over whom it is exercised."[2] Power has also been defined as:

> The ability of any actor to persuade, influence, force, or otherwise induce another actor to undertake an action or change an objective that the latter would otherwise prefer not to do. It is also the ability of one actor to persuade, influence, force, or otherwise induce another actor to refrain from an action that it would prefer to undertake.[3]

Power is an interesting concept since its perceived capability has as much or more to do with its ability to influence an adversary than its actual capability. Also, power many times can take a form that is different from what we might expect. The announcement of the B-2 Stealth bomber to the world sent the USSR scurrying to understand the implications of an airplane that could fly undetected through their homeland. The cost of an air defense system capable of detecting the B-2 was far greater than they could afford. Their only solution, even though they had never seen a B-2, was to harmonize with our objectives and seek long-term peace. If a nation has both the will to use its instruments of power and the methods of employing its weapons, its position of power is elevated. The bottom line is the ability to influence an actor's strategic interests based on his perception of your capabilities, real or imagined!

Perception Management

The intent of strategic aerospace warfare in the year 2025 will be to influence an adversary's leadership to harmonize with our objectives. The most effective method to do this will be through the subtleties of persuasion.

Persuasion is defined as "the process of preparing and delivering messages (through verbal and nonverbal symbols) to individuals or groups in order to alter, strengthen, or maintain attitudes, beliefs, values or behaviors."[4] The key words in this definition are: messages, alter, strengthen, and maintain. Messages are sent to get someone or something to believe what you want. These messages can be in many different forms, but we shall focus on the mental aspects of messages in this section.

The US can either send a direct, truthful message to an adversary, or it can use deception in maintaining an adversary's perception of US intentions. In our opinion, the US must maintain and continue to develop a robust deception program that keys on the adversary leadership's understanding. According to Sun Tzu, "All warfare is based on deception."[5] But be aware as Attila the Hun stated, "One thing a chieftain should always fear more than doing battle is doing battle when only pretending to be prepared."[6] We must always be prepared to back up threats with action.

The key in prosecuting a successful deception program is the ability to attack the mind of the adversary while still having the ability to do battle. John Boyd's OODA loop[7] provides a model that demonstrates how deception can be used to strengthen and project power. Deception provides a very effective method of getting inside the cycle by disrupting the orientation portion. What is real? What is fake? What is the correct decision based on the information provided?

The vision of ***2025***—Global Awareness, Global Reach, Global Power all performed under the umbrella of information dominance will provide the framework for successful direction of the global system.

Notes

[1] John L. Cirafici, *Airhead Operations: Where AMC Delivers* (Maxwell AFB, Ala.: Air University Press, March 1995), 67–68.

[2] Quoted in Daniel S. Papp, *Contemporary International Relations: Frameworks for Understanding* (New York, NY: Macmillian Publishing Company, 1994), 28.

[3] Papp, 401.

[4] Quoted in Gary C. Woodward, "Persuasion & Influence in American Life," (Prospect Heights, IL: Waveland Press, 1992), 18.

[5] Sun Tzu, *The Art of War*, trans by Samuel B. Griffith (London: Oxford University Press), 41.

[6] Wess Roberts, *Victory Secrets of Attila the Hun*, (New York, NY: Dell Publishing, 1993), 114.

[7] David S. Fadok, *John Boyd and John Warden: Airpower's Quest for Strategic Paralysis* (Maxwell AFB, Ala.: Air University Press, February 1995), 16.

Appendix B

Proposed Organizational Structure

There are many areas today that could begin to transform for ***2025***. By this we mean an ongoing study of contextual elements within the subregion to the region and finally to the theater level. The results of the theater analysis should be forwarded to a "notional" national agency that combines the results of the other commander in chief (CINC) studies to determine a global perspective that will provide guidance to make strategic decisions.

Staff Flexibility

Theater-oriented CINC staffs should be organized for maximum flexibility and adaptability to handle the myriad of potential contingencies that may arise in ***2025***. The first step that needs to be taken is that all staffs everywhere adopt the organization of joint directorates.

> Unless there is learning and evolution taking place in how you go about doing knowledge work–in how you're organized to do it, how you handle knowledge, how you develop people, how you pay attention to the competitive environment–unless you're constantly getting better at all of these things and more, you're being sloppy, and there's a good chance that, eventually, you will find your organization falling behind.[1]

By instituting the joint-directorate approach in all organization's, the flow of knowledge will have clearly defined paths. The J-5 of one organization should talk to the J-5 of another organization. They must not in the future waste time trying to figure out the difference between XONO, XOXO, or XONB and what information needs to flow where. Once we have created the framework for knowledge work we can now look at the requirements for decision making in our organizations of ***2025***.

Mr Pasmore, in his book *Creating Strategic Change*, states that,

> by the time people are ready to decide something, the knowledge work is over. Therefore, all of the attention that has been placed on organizational decision-making is in fact *mis*placed. The real knowledge work goes on long before the meeting at which the decision is made; and it tends to be a very messy, disorganized process, open to the full negative forces of human foibles and social dynamics. By the time the decision is framed, the battle is over; it's classic garbage-in-garbage out.[2]

To really affect the decision-making process, intervention and guidance must be inserted, "while the knowledge is still being developed."[3] To create an environment for effective decision making, the organization must be structured to maximize knowledge. We propose an organizational structure to maximize the potential of our leaders and planners discussed earlier.

The Polynoetic Organization

The classic "J-staff" has many centers of knowledge, from J-1 through J-8. To improve integration and knowledge transfer while retaining accountability, the proposed organizational structure for ***2025*** is a polynoetic organization presented by Mr Pasmore and illustrated below.

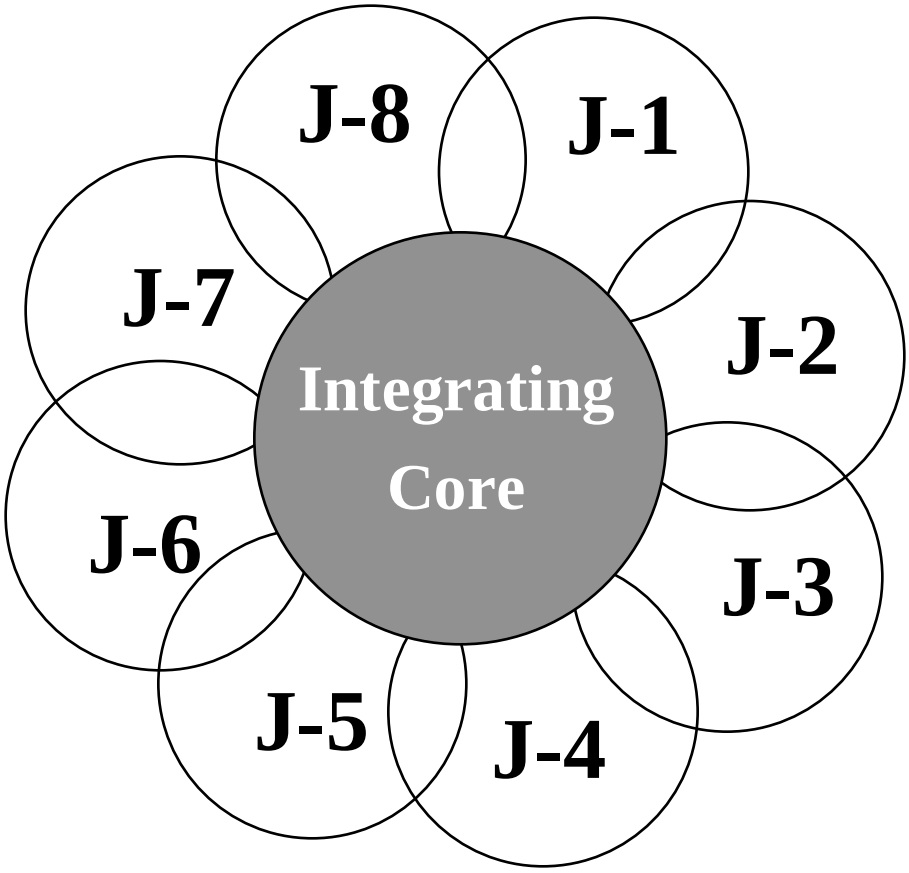

Figure B-1. The Polynoetic Organization

> The polynoetic organization is coordinated by a central group of knowledge workers who are themselves representatives of the various projects and activities undertaken by the organization. In addition, the integrating group contains individuals who represent administrative support functions . . . which provide information crucial to decision-making when such information is appropriate. In contrast to typical top management groups, the integration group has no stable membership or roles. The membership of the group varies upon the topics under discussion, the players heading up important projects, and suppliers of information relevant to the discourse. The integration group provides overall strategy guidance and allocates resources among competing demands. Leadership within the integration group rotates depending again on the knowledge demands of the ongoing and special deliberations on the agenda.[4]

This organization of a staff can be transformed for the occasion. This allows flexibility to adjust a staff based on the circumstances and unleash the power of the integrating core made up of the leadership corps. For example, a logistics-intense operation may require the J-4 to be the lead agent vice the J-3. An information-intensive operation may require the J-6 to be the lead agent. It also allows a multitude of

projects to be coordinated simultaneously integrating the various outputs. The intent of this organizational structure is to allow a CINC the ability to mix and match knowledge within his staff to create effective decisions and direct appropriate influence on the global system.

Structure has a direct bearing on the effectiveness of a staff:

> The most important intervention to improve deliberation quality is to redesign the organization so that effective deliberations take place naturally, rather than fighting against improper structural influences. The organization design for effective deliberating takes into account the need to constantly realign knowledge with authority, yet integrate the outcomes of separate deliberations.[5]

Another key aspect is the overlap of functional areas. All the J-staff functional areas should have some type of overlap or interactivity with the other J-staff areas. These "liaisons" are critical in sharing knowledge among the directorates and may in fact be automated computerized filters that sort through the piles of information and direct it to the appropriate joint directorate based upon keyword, icon, identification. In ***2025*** you no longer need to address where and to whom you believe your knowledge should go. Once it is created you just put it into the server and it is automatically routed to the appropriate agencies and anyone else who is pulling the data. We believe that to further enhance our ability to influence the global system properly, functions and duties within the joint directorates must expand.

J-Staff Functions

We must begin today reorganizing and restructuring the staffs to prepare them to properly influence the nonlinear global system. Each J-Staff directorate should be organized along the lines of the polynoetic organization as explained in the body of this paper. This organizational structure is integral to maintain the efficient transfer of knowledge on the staff and within the directorate itself. In fact each directorate is set up as a system within a system.

For example, the J-1 directorate should have liaison cells that interact on a daily basis with the J-2 through J-8. This keeps the integrating core of J-1 informed on the activities of the rest of the staff and helps reduce friction within the directorate. Additionally, the functions of liaison should be rotated among the "action officers" to keep them abreast of the activities within the other directorates and how they function. This is critical in maintaining an educated core of staff officers that can perform within several areas of expertise if the need arises. Functions within the directorates itself should be along the same lines as

described in Air Force Systems Command Publication-1. However, we believe that some areas need to be explored in greater depth.

J-1, Current contingency planning requires manpower to "open" a unit type code (UTC) to determine the exact manning requirements for that UTC. The manpower functional manager must coordinate with both the UTC functional manager and the AFSC functional manager to ensure proper manning for a contingency. This takes up more time than what should be considered appropriate. As ***2025*** approaches, manpower and personnel will have a critical function to deal with a smaller military. It will be essential that J-1 be the "lead agent" for *developing* force packages (manning levels) to deal with a contingency. However, the time for determining proper manning levels and coordinating through the functional areas must be done in a shorter amount of time than is done today. It would greatly enhance the planning process if the liaison cells for each functional area could report directly to a tasked unit for appropriate manning information. This becomes a critical concept when balanced against the possibility of a smaller Air Force and smaller manpower base. The CINC-level planners must have the authority to deal directly with other CINC's to pull the appropriate manpower to deal with a contingency.

J-2, Intelligence: The emphasis of this directorate should remain on the "enemy". However, greater emphasis should be placed on identification and contextual understanding of potential strategic targets within the global system (e.g., how they could be influenced and what type of feedback would be required to measure success in influencing those targets). The directorate should be divided into theater, region, and subregion teams. These teams should undertake a comprehensive analysis of contextual and operational elements for their area of responsibility on a daily basis (using a bottom-up approach from the subregion to the theater level). These teams must have a direct link to any other US intelligence agencies (Central Intelligence Agency, Defense Intelligence Agency liaison, etc.) for a complete analysis of their assigned areas. Key to success in this area will be the successful fusion of the enormous amount of information available through filters to create true knowledge. We recommend the consolidation of as many "intelligence" agencies as possible to flatten the intelligence community. Will there really be a requirement for the CIA in ***2025***? What is the function of intelligence between a CINC staff and the CIA? Where does DIA fit into the equation? What is the purpose of the Naval Intelligence Command? We believe that intelligence is intelligence, regardless of who is providing it. Information must be shared, otherwise it is

useless. Get rid of the compartmented intelligence agencies and start basing intelligence on subregion to region to theater and finally to global for proper analysis. The coordination process is the most important aspect of planning. Based on the information provided by J-2, strategic targets can be identified prior to the onset of hostilities and effective means of servicing those targets can be coordinated by the other directorates.

Another important aspect of the J-2 should be feedback, or measuring success. A method must be determined before the onset of hostilities whether the selected influence is having the desired effect on the leadership's strategic aims. Access to all source information and monitoring adversary leadership positions on their original versus current courses of actions must be accomplished, and we believe it is the J-2's role to do this. It is crucial that an effective measure of an adversary's reactions be in place. By placing pressure on the adversary's strategic interests, the J-2 should be able to report probable or possible courses of action the adversary leadership may take. Once an action is taken by the adversary, it should be measured against the "desired" course of action and a resultant change in our strategic targeting should take place. This is the key element in prosecuting strategic warfare.

J-3, Operations: Directs and controls current operations. Work begins with the initial planning and extends through the integration and coordination of joint operations. May be charged with the conduct of special operations, including psychological operations and special warfare, joint training and coordination of joint exercises (AFSC Pub 1). Aerospace, land and sea components fall under the J-3 during contingency operations. These components must be able to identify capabilities for accomplishing the mission and conducting employment operations. To enhance the capabilities of the J-3, we feel some aspects of planning require drastic improvements to reduce planning cycle times and graphically displaying the end results of a "plan". These improvements include functional experts that can quickly identify requirements and a graphics display board.

Personnel Requirement: Properly trained functional experts that can rapidly identify weapon systems to accomplish the desired mission. These experts should have the functional expertise to determine which UTCs are required for mission accomplishment. They should be operationally oriented experts that have a broad knowledge in their respective fields of expertise (e.g., fighters, airlift, spacelift, engineering, support, etc.). The intent is to rapidly identify requirements for a CINC to accomplish a mission. Time is the essential factor to maintain information dominance and disrupt an adversary's OODA cycle. These

requirements should be graphically displayed on a planning board for a visual presentation for the planning staff.

Technical Requirement: 3-D holographic planning board. Display from theater to subregional view of the "battle space." This should be applied to a "laptop"-type device with a window format to enhance deployment, employment, and redeployment planning. A window-in-window format would expand the area of emphasis showing possible beddown locations, terrain, strategic targets as determined by the J-2, enemy integrated air defense systems threat rings, global projection drop zones, and so forth. Once forces have been identified for deployment and beddown locations have been identified (using a "drag and drop" system with a movement priority identification system), the board could be used to war game an ATO or campaign to deconflict packages while viewing the "battlespace." This system would enhance the commander's overall view of the battlespace and graphically display the big picture. After witnessing the joint planning tool and other "systems", it would make sense to fuse the displays to provide this information. However, it is becoming evident that technology is enabling the concept of centralized execution. This area needs further examination for future commanders and war fighters.

J-4, Logistics: Develops logistics plans and coordinates and supervises supply, maintenance, repair, evacuation, transportation, construction, and related logistics activities. Responsibilities may include weapons surety, civil engineering support, transportation management, and so forth. Because logistics support is a service responsibility, the primary thrust of joint logistics operations may be to coordinate service programs and integrate them with the joint commander's concept of support. Knowledge of service policies and doctrine is essential (AFSC Pub 1). J-4 must be responsible for theater distribution of both manpower and equipment and not the components. They should also be responsible for determining all strategic lift requirements to move assets into their respective theater (based on the apportioned lift). The J-4 must have a system (comparable to the J-3 holographic planning board) in place that will display all friendly fielded forces that are involved in operations. This system should provide the J-4 the ability to provide a view of the battlespace for the purpose of updating deployment, sustainment, and redeployment operations through the use of all weather, precision delivery of supplies, manpower, and equipment.

J-5, Plans: Does the long range planning. Prepares campaign, concept, and operation plans and the associated commander's estimate of the situation. Often, the J-5 is responsible for special weapons planning

(AFSC Pub-1). The J-5 should be organized into theater, region, and country teams to analyze contextual elements and create the appropriate oplans/conplans/functional plans and time-phased force deployment data plans. These teams should interface with J-2 teams and J-8 teams for comprehensive understanding of their areas of responsibilities. Additionally, the J-5 should be intimately involved in the acquisition process. All actions will have a strategic impact and the acquisition process will have major ramifications on the overall balance of strategic influence. The group in J-5 that would have inputs to the acquisition process would be performing the functions of a joint requirements oversight council/joint warfighting capability assessment team at the CINC level.

J-6, C^4I: Functions include handling command responsibilities for communications and frequency control, tactical communications planning and execution, and management and development of electronics and automatic information systems to include hardware, software, and connectivity. Ensure interoperability with the services (AFSC Pub-1).The J-6 should be the CINCs lead agent for information warfare. They would be the experts of both hardware and software to prosecute information warfare. Based on the inputs from the other directorates, the J-6 would be able to execute.

J-7, Interoperability: This directorate should ensure joint operations are coordinated. Functions should also include Deception & Black programs. The J-7 would ensure these compartmented programs are integrated into any operation. Any "special" tasked mission should be run from the J-7 directorate. This directorate should have a secure facility that houses a special mission control area that would provide connectivity to any platform tasked to perform special missions. These missions would remain out of the public eye and could be planned, controlled and executed from this facility. The J-7's from all the CINCs would require a special category (SPECAT) message system to ensure unity of effort for all operations and connectivity to the national level agency.

J-8, Resources (Civil Agencies): Liaison cells organized in the same manner as the J-2 would greatly enhance the interoperability of the military functions with all non-military agencies and organizations. Interaction between and with international nongovernmental organizations, international governmental organizations, international private organizations, Department of State, and the military becomes crucial. Staff members should become expert liaisons with political institutions such as the United Nations, civilian

institutions that may have economic instruments that may be useful to a CINC, and so forth, especially in view of the MOOTW aspect of operations that may become more prevalent.

Notes

[1] William A. Pasmore, *Creating Strategic Change: Designing the Flexible, High-Performance Organization* (New York, New York: John Wiley and Sons, Inc., 1994), 162.
[2] Ibid., 158.
[3] Ibid., 159.
[4], Ibid., 166.
[5], Ibid., 165.

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