INTIMIDATING THE WORLD:
THE UNITED STATES ATOMIC ARMY,
1956-1960

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Paul C. Jussel, B.A., M.M.A.S., M.S.S.

* * * * *

The Ohio State University
2004

Dissertation Committee
Professor Allan R. Millett, Advisor
Professor John R. Guilmartin
Professor William R. Childs

Approved by
Advisor
Department of History
ABSTRACT

The atomic bomb created a new military dynamic for the world in 1945. The bomb, if used properly, could replace the artillery fires and air-delivered bombs used to defeat the concentrated force of an enemy. The weapon provided the U.S. with an unparalleled advantage over the rest of the world, until the Soviet Union developed its own bomb by 1949 and symmetry in warfare returned. Soon, theories of warfare changed to reflect the belief that the best way to avoid the effects of the bomb was through dispersion of forces. Eventually, the American Army reorganized its divisions from the traditional three-unit organization to a new five-unit organization, dubbed pentomic by its Chief of Staff, General Maxwell D. Taylor.

While atomic weapons certainly had an effect on Taylor’s reasoning to adopt the pentomic organization, the idea was not new in 1956; the Army hierarchy had been wrestling with restructuring since the end of World War II. Though the Korean War derailed the Army’s plans for the early fifties, it returned to the forefront under the Eisenhower Administration. The driving force behind reorganization in 1952 was not
only the reoriented and reduced defense budget, but also the Army’s inroads to the
atomic club, formerly the domain of only the Air Force and the Navy.

But investigation into formerly classified government records indicates the
effectiveness was dependent upon the adoption of three essential elements: mobility,
firepower, and communications. Mobility complemented dispersion and allowed
concentration at the desired place. Firepower, especially tactical atomic weapons but not
limited to them, amplified the ability of dispersed units to defeat or destroy an enemy. To
coordinate all of these efforts, a new level of communications was essential to tie all of
the units together. The evidence indicates that the pentomic organization was neither
based on the Eisenhower administration policy of massive retaliation nor solely
dependant on the atomic weapons for its effectiveness. Rather, the organization evolved
over time through a gradual process of experimentation and continuous dialogue among
senior Army leaders.

More was required than experimentation and dialogue. General Taylor ordered
the pentomic reorganization, but failed to support fiscally the necessary developmental
requirements. Scientific progress did not match expectations; equipment was not
sufficiently advanced to base an organization on the expectation of its arrival. As a final
failure, the majority of the Army only found fault with the new organization and had little
confidence in it. Within four years of its implementation, the pentomic organization was
discredited. The Army returned to its traditional three-unit division organization with
much relief.
For My Son
ACKNOWLEDGMENTS

No work of this nature is completed alone; my thanks go to many people. Dr. Allan R. Millett carefully guided me through this process and patiently abided my clipped military writing style. Dr. Brian McAllister Linn gave me the idea for this work and very graciously provided support. Dr. Robert Cameron, the Armor Center Historian, Fort Knox, KY pointed me to many of my initial resources. Mrs. Lorraine Allen, Armor Center Research Librarian, was untiring in her efforts to find the obscure references I needed. Mrs. Dianne Atcher, International Military Student Office, Fort Knox, provided much assistance in tracking down the extent of allied officer involvement in Armor Center training in the fifties. Mrs. Ginny Navarro, Combined Arms Research Library Special Collections Librarian, Fort Leavenworth, KS, provided guidance and direction while searching through the classified stacks for material. Ms. Wendy Rejan, U.S. Army Communications and Electronics Command Historian, Fort Monmouth, New Jersey, provided me unfettered access to their records. At Carlisle, Mr. Randy Rakers and Mr. Adam Priester, from the Military History Institute’s Classified Records Section, were absolutely invaluable in searching their stacks for material that pertained to the pentomic
times. Mr. James Wendt, Department of Energy, graciously traveled to Carlisle to declassify many documents and reviewed this manuscript to ensure I violated no regulations. Mr. Richard Baker and Mr. Mike Monahan frequently focused my wanderings through the MHI library. Mr. Dave Keogh, MHI, provided access to the oral histories and personal papers of many senior leaders who occupied positions of responsibility in the fifties. My fellow officers in the Department of Military Strategy, Planning, and Operations frequently provided encouragement, a kind word, and a cold beer to further my efforts. Finally, my wife, Debbie, patient and nurturing as always, provided the necessary support to finish this project; without her it would not have been possible.
VITA

24 November 1956 ............... Born – Elisabeth, New Jersey

1979 ......................... B.A., History, Virginia Military Institute, Lexington, VA

1990 ......................... M.M.A.S., Military History, U.S. Army Command and General Staff College, Fort Leavenworth, KS

1991 ......................... M.M.A.S., Theater Operations, U.S. Army Command and General Staff College, Fort Leavenworth, KS

2000 ......................... M.S.S., National Strategy, U.S. Army War College, Carlisle, PA

PUBLICATIONS

Research Publication


# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Dedication</td>
<td>iv</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>v</td>
</tr>
<tr>
<td>Vita</td>
<td>vii</td>
</tr>
<tr>
<td>Chapters:</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1. The U.S. Army and the Challenge of Atomic Warfare</td>
<td>9</td>
</tr>
<tr>
<td>2. The Army’s New Look</td>
<td>29</td>
</tr>
<tr>
<td>3. The New Division</td>
<td>78</td>
</tr>
<tr>
<td>4. The Army’s Altar of Technology</td>
<td>122</td>
</tr>
<tr>
<td>5. The Pentana Study in Practice: Reorganizing the Army</td>
<td>164</td>
</tr>
<tr>
<td>6. The Past is Present, Again</td>
<td>206</td>
</tr>
<tr>
<td>Bibliography</td>
<td>214</td>
</tr>
</tbody>
</table>
INTRODUCTION

I grew up in an old, established neighborhood, just outside of New York City. Most of the houses were Victorian in architecture, large and very detailed. Our family was large so there was always plenty of activity. Our left-side neighbor also had a large family; we all played together. But that neighbor had something we did not: a fall-out shelter in his basement. In the early sixties, our young heads filled with images of aliens from outer space or black-hatted cowboys, the basement shelter was our special fort protecting us from every invasion or evil villain.

It never occurred to me to ask why there was a reinforced concrete block fall-out shelter in my neighbor’s basement. It seemed a natural thing to my child’s mind. But why would my neighbor, an executive in a large corporation and a seemingly rational man, have a fully equipped, stocked shelter in his basement? What caused this man, and many others to go to such trouble and expense to protect his family from a Soviet attack? What caused this man, and many others, to believe that the nation’s armed forces would be unable to protect the homeland in the eventuality of The Bomb?
The dramatic postwar change from conventional to nuclear warfare forced the U.S. Army to find a new paradigm to fight and win the nation’s wars. This study will examine the Army’s 1956 decision to reorganize the core of its combat capability – the division – into a nuclear-capable organization based on a “pentomic” concept of five battle groups. The organizational change was intended to allow the divisions to fight more effectively on an atomic or non-atomic battlefield anywhere in the world. The Army spent millions of dollars developing the organization and purchasing the equipment to support it. Active divisions finished the reorganization quickly and National Guard and Army Reserve divisions completed the change by 1960. Yet, as presidential administrations changed, the Army had not resolved the basic questions of appropriate divisional organization. To make matters worse, the paradigm had shifted away from reliance on massive nuclear retaliation and the pentomic division seemed inadequate. In 1961, Army Chief of Staff General George H. Decker concluded the pentomic division “was not ‘a suitable vehicle for combat’” and abolished it. The background of this organizational change has significant similarities to current transformations in the Army’s warfighting capabilities. As they struggle with doctrine, organization, and equipment, today’s Army leaders face a similar challenge in institutional adaptation: reorganizing the divisions for more rapid deployment against potential post-Cold War adversaries.

In many respects, the pentomic division owed its origins to President Eisenhower’s promise “to cut federal spending, to eliminate the budget deficit and to reduce taxes.” After his electoral victory, Eisenhower set about to fulfill his promise. Firmly believing that “a free and expanding economy” would maintain American “productivity and political liberty,” Ike refused to allow the federal budget to expand
beyond the limits imposed by Congress and reduced the inherited fiscal year (FY) 1954 budget by nearly $5 billion. One of his primary goals was to establish a comprehensive national security strategy and establish spending priorities for the “Long Haul” of national security. Eisenhower was opposed to the national economic focus on defense and wanted to turn the economic sector to consumer goods and international development. This effort to refocus economic priorities would create a more robust national economy and remove the dependence on military spending. The New Look refined defense priorities, established a clear national priority, and preserved the nation’s budget.

Under Eisenhower’s direction, the National Security Council (NSC) debated various methods to implement this strategy and in 1954 settled on “massive retaliation.” As Secretary of State John Foster Dulles conceived it, the United States would reserve the right to respond to threats worldwide with means so destructive that no rational nation would invite their consequences; United States nuclear superiority would deter aggression. Concurrently, the Department of Defense focused its efforts to implement the President’s New Look. This policy reduced the Korean conflict defense budget and emphasized the basic tenet of response with nuclear bombs. In consonance with Eisenhower’s view that conventional military forces were ill suited for nuclear war, the New Look slashed Army manpower to a level capable of responding to small crises only.

To replace the manpower lost by U.S. forces, the New Look turned to regional alliances to confront Soviet aggression. American support would be limited to equipment, supplies, and specialists; the allies would supply the soldiers. The most important of these regional alliances was the multi-lateral North Atlantic Treaty
Organization (NATO), established in 1949 in Europe. Although he had been NATO’s first commander, Eisenhower was determined to revise the Army commitment to NATO and European defense. Initially only one infantry division, this had deepened during the Korean War to six divisions and several separate brigades. Eisenhower wanted to reduce this commitment; the Army’s portion of the New Look defense budget was the impetus to force it.

Eisenhower’s determination to cut ground forces followed from his conviction that national defense through massive retaliation should be based on the nuclear-capable services: the Air Force and the Navy. While they both prospered in the annual defense budgets, the Army was effectively shut out of the nuclear club in the early fifties. To fit in with Eisenhower’s view of national security, the Army needed to embrace the Atomic Age and transform itself into a force capable of waging nuclear warfare. In the Eisenhower era, a large proportion of Army research and development funds went to missiles, large cannons, and small rockets that could deliver tactical, small-yield nuclear bombs. These included the Honest John, a tactical surface-to-surface missile with a range of 22 miles, the 280mm “Atomic Annie” cannon, and the Davy Crockett, a small missile with a range of 1.25 miles. Army leaders had to revise doctrine to make the best use of these new weapons in three very different war scenarios: a major conventional war such as World War II; a limited theater war such as in Korea; and a general nuclear war. In the view of many military experts, these three wars required military forces that were not only very different from each other, but in some cases were mutually incompatible. Faced with the impossible challenge of creating three different armies, the Army leadership focused on nuclear wars; the forces and weapons for a general conventional
war or a limited war were not specifically resourced. The Pentomic division was one of the most important ways in which the Army sought to reinvent itself to fight an atomic war, while still maintaining its ability to deal with a variety of other contingencies.

The Army’s pentomic experiment is the focus of this study. Three areas will be addressed: Army directives and studies on technology and nuclear weapons; the implementation of change within the Army; and the Army’s response to this change. The answers of how to fight under atomic conditions are contained in the major organizational change in response to these issues: the pentomic division.

This study argues that the leadership within the Army, at many different levels, recognized the need for reorganization to take advantage of the reality of nuclear operations and new technology. Recommendations for a five-unit division were made as early as 1952, but progress was slow as different agencies examined new concepts for organization and potential new technology for equipment. Army Chief of Staff General Maxwell D. Taylor took the organization examined by his predecessor General Matthew B. Ridgway and applied it to the Army in 1956. The new pentomic structure was refined over the next few years, incorporating some new equipment, and evolved into a different organization by 1960 than the one envisioned in 1956.

Chapter One, The U.S. Army and the Challenge of Atomic Warfare, establishes the background for the study. It addresses the impact of Eisenhower’s New Look on national security, the reliance on massive retaliation, the revised priorities within the Defense Department and the rise of the Air Force and Navy nuclear arms.

Chapter Two, The Army’s New Look, examines the Army’s post-Korean conflict assessments, the debate within the Army about organizational change, and the

**Chapter Three, The New Division**, examines the organizational and conceptual themes that contributed to the pentomic organization. These included Army doctrine for operations in nuclear war, the results of major field training exercises, and the internal debate over divisional reorganization. Alternative organizations and dissenting opinions to the pentomic design are examined, particularly those of Army Service School Commandants. Service school student papers, service journals, and official Army publications serve to illuminate Army thought on the new organization.

**Chapter Four, The Army’s Altar of Technology**, examines development of the technology to support the pentomic division. It assesses the role of mechanization and the development of armored personnel carriers, tanks, armored support vehicles,
communications equipment, and tactical nuclear weapons for the divisions. This chapter relies heavily on previously classified Combat Development studies from U.S. Continental Army Command.

**Chapter Five, The Pentana Study in Practice: Reorganizing the Army,** explains the actual implementation of the organization, its assessment, and its demise. It examines official histories, such as John B. Wilson’s *Maneuver and Firepower: The Evolution of Divisions and Separate Brigades* (1997), as well as personal papers from contemporary leaders at Army, Major Command, Corps, Division, and Battle Group level to discover how the division fared in tests and exercises. Details of the reorganization are examined to assess its impact on the different divisions in the United States, Europe, and the Far East. It addresses institutional difficulties, such as the elimination of battalions, as well as leadership difficulties, such as the training programs and the lack of field grade leaders. Finally, it details how both inherent and external problems with the pentomic division led, first to growing criticism, then to substantial revisions, and finally to an almost complete repudiation of the pentagonal division structure.

**Chapter Six, The Past is Present, Again,** concludes with the relevant concepts from the experience that are applicable to the Army’s current search for new organizational improvements. This chapter examines some of the parallels between the Army’s pentomic experiment and the current Army transformation.

2 The former Army Chief of Staff, General Eric K. Shinseki, articulated this view on the post-Cold War transformation several times. See General Eric K. Shinseki, Address to the Eisenhower Luncheon at the 45th Annual meeting of the AUSA, 12 October 1999; Shinseki, “The Army Transformation: A Historic Opportunity”, *Army*, October 2000, 21-30. The current Chief of Staff, General Peter J. Schoomaker, went even further in reorganizing the Army by instituting a change that will eventually create five brigade units in a division, highly reminiscent of the pentomic era.


4 Bacevich, 94-96.

CHAPTER 1

THE U.S. ARMY AND THE CHALLENGE OF ATOMIC WARFARE

The pentomic experiment is rooted in the Army’s belief in the 1950s that war with the Soviet Union, an eventuality sooner or later, would be a nuclear war. The Army leadership, believing that the bomb had changed land warfare but uncertain exactly how, attempted to create ground combat forces that benefited from the weapon’s great destructive power, but avoided its effects. The Army’s traditional military concept of dominant landpower had been changed forever in August 1945 by the atomic bomb, and in order to remain relevant, the Army had to adapt itself to this new weapon. The 1956 pentomic restructuring was an attempt to create a new field Army built, in part, upon a swiftly deployable pentagonal organization, capable of rapid movement and sustained land combat in a nuclear environment. The history of that experiment shows that it was not, as critics claimed, merely an arbitrary reaction to the atomic revolution and the postwar Army’s loss of prestige and power. Rather, the pentomic experiment was a gradual, logical, and complex organizational restructuring that offers not only a
fascinating study of intellectual, technological, and institutional innovation, but of the
problems inherent in transforming a military organization.

The atomic monopoly gave the United States the most powerful military in the
world until 1949, when the Soviet Union exploded its first atomic bomb. The nation’s
security came not only from America’s scientific and industrial ability to produce atomic
bombs but also from a defense structure that could deliver the bombs to the industrial,
political, and military heart of the Soviet Union. President Harry Truman emphasized the
reliance on the bomb, and the rest of the military, during his years in office. His principal
advisors, especially Secretary of State Dean Acheson, also advocated the dual capability
of the conventional and nuclear military. Fundamental American strength came from its
industrial capacity as well as its military abilities. In national security terms, the
economic abilities of America had a dual purpose: maintain the capacity to support
foreign policy initiatives and to provide the base for military strength to protect those
initiatives. By 1947, it was apparent that the Soviet desire for security would conflict
with United States interests on the Eurasian landmass. Truman’s efforts became focused
on thwarting global Communist expansion; the Truman Doctrine – to respond to Soviet
expansionism anywhere and everywhere – served this purpose.¹

To support Truman’s policies, the United States military needed to present a
credible threat to the Soviet leadership and its armed forces. The atomic bomb delivered
by the long-range strategic bomber was not only the most tangible manifestation of this
threat; it was the only threat the U.S. possessed. The Soviet armies in Europe greatly
outnumbered the American constabulary forces stationed there in the late forties, and the
Western European nations were incapable of increasing their own military spending.
Demobilization in 1945-46 eliminated Army ground forces as a significant deterrent. The Navy, although not as severely cut as the Army, was also greatly reduced in power. The one service that gained as World War II ended was the Army Air Forces, which enjoyed a monopoly over the means to deliver America’s new atomic deterrent. The ascendancy of the Air Force and its bomber force continued when the National Security Act was signed into law in 1947. The Act created a National Military Establishment, forerunner of the Department of Defense, as well as a separate Air Force. Unfortunately, while the Act gave broad mission areas for the services, many specifics were left unresolved. Debate continued as each service postured for advantage over one another; rather than creating a unified military establishment, the Act exacerbated the existing tension.²

In 1948 Secretary of Defense James Forrestal convened meetings in Key West, Florida, and Newport, Rhode Island, to secure from the service chiefs a clear delineation of duties and responsibilities. From the national security viewpoint, their agreements solidified the Air Force role and the national reliance on its bombers. “Strategic air warfare, defense of the United States against air attack, and air and logistic support of ground forces” remained Air Force tasks; later tasks included supervision of the Armed Forces Special Weapons Project, the military side of the Atomic Energy Commission, and “primary” responsibility for strategic, meaning atomic, air operations. The Navy retained its traditional mission of sea control and won concessions to allow development of an atomic-capable naval air component, to be used consistent with the protection of the fleets and the attack of naval targets. The Marine Corps’ role in amphibious warfare was also reaffirmed and, for planning purposes, was authorized four divisions, which could
not constitute another land army. The Army suffered more from neglect than from service rivalry. Though the draft was restored and there was significant debate over a national air defense system, Army Chief of Staff General Omar Bradley gained little from the discussions. Bradley was an active participant in the debates, but left both Key West and Newport with little more than acceptance of the Army’s continued existence. Seemingly, the Air Force was the only service necessary for the nation’s strategic defense and the others would simply support them or possibly handle lesser threats.³

The National Defense Act sparked significant military and political dissention, budget debates, and eventually a presidential commission to assess the Executive Department organization. Congress was forced to step in to reshape the Department of Defense two years later. The 1949 amendment to the National Security Act invested more power in the Secretary of Defense, created a Chairman of the Joint Chiefs of Staff to speak for the different service chiefs, and reduced the civilian military secretaries from cabinet members to subordinate executives to the Secretary of Defense. But the amendment did nothing to challenge the Air Force’s position of superiority over the other services.⁴

In addition to the Congressional Acts, other studies sustained Air Force dominance in the defense arena. The most significant document of the late forties was National Security Council (NSC) Memorandum 68, presented to President Truman in early 1950. It summarized the threats to America’s security into one area: the Soviet Union would do everything in its power to achieve world domination. The only nation capable of stopping Soviet expansion was the United States. To do that, NSC 68 recommended expanding all services: Army, Navy, Marines, and Air Force. The
estimated $40 billion necessary to implement the document’s proposals was not palatable to either the President or his advisors and further study was ordered. More extensive analysis ended, however, once the North Korean People’s Army attacked South Korea in June 1950.5

The massive build-up associated with the Korean War reflected the essential elements of NSC 68. Supplemental authorizations to the defense budget grew through 1950, topping $11.6 billion by year’s end. Though the war consumed a portion of these supplementals, much of the money went to reinforce European defenses, strategic reserve forces, and to research and development (R & D) efforts.6 The Navy expanded its carrier fleet from 15 to 27 and the rest of its combatant fleet from 223 ships to 315. The naval air arm, both Navy and Marine Corps, expanded substantially; many reserve squadrons were activated and integrated into carrier operations. The Army expanded to provide forces not only for Korea, but also for Europe. Eight National Guard divisions were activated to operate in both theaters, with two divisions deployed to Europe and two divisions to Korea. The Air Force also received a boost from the supplemental authorizations, increasing from 48 to 87 air wings.7

For the presidential election in 1952, this expansion of the military element of national power, and its attendant dominance of the federal budget, became a major issue in retired General Dwight D. Eisenhower’s campaign against Truman. Using the conflict as the backdrop for his campaign, Eisenhower criticized the ever-expanding federal budget, the projected deficit, and Truman’s methods to solve the looming fiscal crisis. He wanted the federal government to focus its attention on the national economy, reduce federal spending, and encourage the private sector’s increased role.8 As one historian has
noted: “Eisenhower believed that the moral, political, and economic – not military –
dimensions of the struggle against communism were preeminent.”
Eisenhower and the Republican Party vigorously promoted their campaign against Truman and the Democrats; victory was overwhelming.

With the election decided in his favor, Eisenhower moved to end the Korean War. Repeated warnings and veiled threats, reinforcements to the Korean UN Command and the US Far East Command, and Soviet disenchantment, particularly after Stalin’s death in March 1953, brought Chinese and Korean quibbling to an end. The armistice signed in July 1953 separated the communist and UN forces along a demilitarized zone roughly at the 38th parallel. The more significant result of the armistice, a refocusing of United States attention, allowed Eisenhower to direct the nation’s efforts against the worldwide Soviet threat. His task now was to reduce federal spending on the military, increase domestic productivity, and turn the nation’s focus away from the Korean peninsula.

As part of the effort to refocus the nation, Eisenhower took steps to increase alliances and mutual aid treaties, particularly in Europe. Eisenhower had served as the North Atlantic Treaty Organization’s (NATO’s) first Supreme Allied Commander, Europe (SACEUR) until he retired again in 1952. He understood the threat to Europe posed by the expanding Soviet influence. He also understood NATO’s inability to defend against a conventional Soviet ground attack. Though American units in Germany had increased during his time as SACEUR, Eisenhower knew the Allies had to participate in their own defenses more than they were. He believed American ground support could be reduced, in time, to a minimal level; Allied armies had to expand to protect themselves and U.S. support could be reduced to air and limited ground forces to bolster them.
With the overwhelming mandate from the November election, the new President changed Truman’s defense fiscal priorities. Flexibility within the budget came from the Defense Department, the Atomic Energy Commission, and the Mutual Security Commission; these organizations could accept cutbacks without significant changes to existing laws. The rest of the budget was fixed to federal statutes and could not provide any significant savings. Firmly believing that “a free and expanding economy” would maintain American “productivity and political liberty,” the new President refused to allow the federal budget to expand beyond the limits imposed by Congress. Though he reduced the inherited fiscal year (FY) 1954 budget by nearly $5 billion, Eisenhower knew he could force it lower. Most of the FY 54 reduction came from the Defense Department; more cutbacks were promised.\textsuperscript{11}

To achieve the reductions he desired, Eisenhower realigned the national security priorities. First directing a review of the previous administration’s policies, the President made it clear that national security came from a position of power, both economic and military. Secretary of State John Foster Dulles expressed the policy to the Council on Foreign Relations on January 12, 1954: “The way to deter aggression is for a free community to be willing and able to respond vigorously and at places and with means of its own choosing. . . . The basic decision was [made] to depend primarily on a great capacity to retaliate, instantly, by means and at places of our choosing.”\textsuperscript{12} The predominant interpretation of this placed atomic weapons as the first line of defense for the United States. In Eisenhower’s view, military spending spawned by the Korean War threatened the national economy. With a truce signed, the President saw no reason why the national defense establishment had to remain at a dangerously high level. Eisenhower
frequently voiced his concern over the careful balance between enough security and too much, but made it clear that the United States would maintain a strong military to protect the free world. His new Defense Department team focused on determining how much military that would be, while the President turned his attention to the nation’s economy.

Eisenhower’s military realignment had to be refined and implemented by a varied lot of new administrators. The new Secretary of Defense was the former chairman of the General Motors Corporation, Charles E. Wilson. His expertise was in the corporate world, not the military. Eisenhower justified the selection: “He had the reputation as one of the ablest executives in big corporations. I sought an experienced man of this kind because of the huge procurement, storage, transportation, distribution, and other logistical functions of the Defense Department which, in my opinion, needed to be directed by experts.”

Eisenhower had been critical of the bitter and often public disagreements between the service chiefs who comprised the Joint Chiefs of Staff (JCS). He not only wanted the JCS to speak with a single, unified voice through its Chairman, he also expected the service chiefs to support and obey Administration policy. His selection as Chairman of the JCS was Admiral Arthur W. Radford, an outspoken naval aviator, former Vice Chief of Naval Operations, and Commander of U. S. Pacific Command. A tough Washington in-fighter, Radford was involved in the 1949 “Revolt of the Admirals,” which pitted naval aviators against the Air Force. But either maturity or power changed this one-time insubordinate radical into a strong, even intolerant supporter of the Administration. More articulate than Wilson, he proved more than willing to use his position to suppress
opposition from the service chiefs. His was a powerful voice in support of Eisenhower’s views.

The new Air Force Chief of Staff, General Nathan F. Twining, also supported the President’s defense policies. Twining was already firmly convinced of the value of strategic bombing from his experience as commander of the Fifteenth and Twentieth Air Forces in World War II and his subsequent assignment as Vice Chief of the Air Force. Furthermore, Twining was familiar with the infighting of the Pentagon and on Capitol Hill. He, like Radford, knew how to get things accomplished in the Washington maze. They made a powerful pair, advocating not only strategic bombing, but also the use of nuclear weapons, as the only means of defense against the Soviet monolith.

The new Army Chief of Staff, General Matthew B. Ridgway, was not as much of a Washington insider as either Radford or Twining. He also did not see the nuclear-focused Strategic Air Command as the only element of the Air Force. The XVIII Airborne Corps commander during World War II and U. S. Eighth Army commander in Korea, he understood air power. His view of the military, however, was more focused down on the ground, in a conventional battle, than up in a pilot’s seat in a bomber. He represented the complementary and joint nature of the military services rather than an exclusive view of his own service; he believed success came from the combination of air, land, and sea operations. Ridgway also understood the value of alliances, having succeeded MacArthur as Commander in Chief, United Nations Command in Korea and Eisenhower as SACEUR in NATO. Ridgway was the advocate for a balanced force of air, ground, and sea capabilities for use in trouble spots around the world.
Ridgway’s chief, though not constant, ally was Chief of Naval Operations Admiral Robert B. Carney. Carney had been dual-hatted as the NATO Commander-in-Chief, Allied Forces, Southern Europe and Commander, U. S. Sixth Fleet in the Mediterranean Sea while Eisenhower was his superior as SACEUR. Carney was an advocate for the Navy; his support for another service depended on what the other service wanted and how that position affected the Navy. He supported, as did Ridgway, the need for a balanced military of conventional and nuclear forces. He fully believed the Navy had a role in both types of forces, but recognized that the nuclear forces were both politically and economically more attractive to the Eisenhower Administration. As a result, the nuclear Navy became a very important part of defense planning as the fifties lengthened and eventually contributed to a decline in Navy support for the Army position on conventional forces.14

These five men became the focal point and the manifestation of the internal debate over the military’s future direction. Wilson, Radford, and Twining were willing to embrace change, as long as that change was focused on the long-range delivery of nuclear weapons. Together they represented the President’s vision of national security through economic strength, atomic weapons, and a minimum defense establishment. Ridgway represented the landpower centric ideas of warfare that had been tried and tested all the way through 1953. Carney fit somewhere in between. Their internal debates were representative of the tension within the Defense Department as well as the services themselves and of the nationwide debate over national security. Changing to accommodate new technologies and concepts kept the Joint Chiefs, the Secretary of Defense, and the President at odds for several years.
While Eisenhower’s new defense team assessed their individual services, the President directed the NSC to reexamine America’s position in the world and provide a new look at national defense policy. The result of that assessment was NSC 162/2, published in October 1953. This new memorandum reaffirmed the threat of Soviet Communism, but changed how the United States would respond. Under NSC 68 and subsequent updates, the Truman administration had predicted a year of maximum danger. The last update in January 1953 put the year of maximum danger as the next; Soviet military capabilities would be equal to or superior to US abilities in 1954. This equality meant the United States no longer could use the threat of retaliation as a method of reducing tensions. If the United States used its weapons, the Soviet Union could respond in kind. If they had more weapons than the U.S. did – and the predictions were that they would – then the Soviets had an additional strike capability that the United States did not possess.

NSC 162/2 eliminated “the year of maximum threat” that NSC 68 had predicted. Rather, a “period of maximum danger” was proclaimed and the national defense establishment would be funded to be able to respond at any time, rather than at one peak time. This approach established Eisenhower’s concept of the “New Look” for national defense and the “Long Haul” for national security. Convinced these concepts were correct, the President demanded that Secretary Wilson and the Joint Chiefs of Staff adhere to them. NSC 162/2 established the parameters of defense reform for the near future and it focused on a powerful Air Force armed with nuclear weapons. The Army did not play a large role.15 The Air Force’s powerful friends in Congress – especially Senators Arthur Vandenberg, Barry Goldwater, and ex-Air Force Secretary Stuart
Symington – and in the national press further strengthened the NSC’s findings. Ridgway and Carney did not accept NSC 162/2 or the subordinate budgets, priorities, and missions it relegated to their respective services. The seeds of dissention continued to grow as each service chief argued for an increased budget and more significant role for his service in the new administration.

The Army leadership’s greatest criticism of the New Look was that it left the U.S. with the options of massive retaliation or weak conventional operations. Ridgway had served in the top position in the Far East and in Europe. He, like Eisenhower, understood the relationships among the United States and its allies in each region. He believed that nuclear weapons could not answer all of the situations posed by crisis or conflict in either Europe or the Far East. Why, the Army Chief of Staff pondered, should the ground component shrink when it was obviously the first choice for response to global crises? How could the United States respond with nuclear weapons to a Communist insurgency? The answers to these questions, in Ridgway’s view, called for a large land force with adequate air support.

The Army’s opposition to both the Administration’s and the Radford-controlled JCS came to a head as the debate on the 1955 defense budget started in earnest in the second half of 1953. Ridgway made his position clear: though twenty divisions, with nearly 1.5 million soldiers, were on active service, he could not justify any reduction. American global commitments required the presence of six divisions in Europe, seven in the Far East and seven more in the United States as strategic reserve. If the administration relied on the guidance of NSC 162/2, such strength was necessary to counter the aggressive and numerically superior Soviets. Ridgway anticipated neither the
single-minded purpose of Defense Secretary Wilson nor the President’s determination: there would be cutbacks and the Army would bear them. Writing in his memoirs, Ridgway noted: “The real situation then dawned on me. This military budget was not based so much on military requirements, or on what the economy of the country could stand, as on political considerations.”17 These political considerations meant the proposed FY 55 defense budget would be $37.5 billion as compared to $42 billion projected by the military services. The 1955 allocations required the Army to reduce by three hundred thousand soldiers but maintain the twenty division flags. Ridgway opposed this reduction, but Wilson overruled him. The Air Force, and to a lesser extent the Navy, benefited under the new budget. With the emphasis on nuclear weapons, the Air Force’s Strategic Air Command and the Navy’s nuclear capable carrier fleet became the first line of the nation’s defense; increases in manpower and equipment were logical. Nuclear deterrence provided the ultimate in defense; no rational nation would risk being on the receiving end of America’s might.18

After a year in office, Eisenhower reaffirmed his view of national security in his State of the Union address on January 7, 1954. After acknowledging the availability of atomic weapons, the President noted: “we take into full account our great and growing number of nuclear weapons and the most effective means of using them against an aggressor if they are needed to preserve our freedom. Our defense will be stronger if . . . we share with our allies certain knowledge of the tactical use of our nuclear weapons.” He then went on to say that the: “new weapons create relationships between men and materials. These relationships permit economies in the use of men as we build forces suited to our situation in the world today. . . . the airpower of our Navy and Air Force is
receiving heavy emphasis.” Eisenhower summed up his security portion of the address by indicating: “The defense program recommended in the 1955 Budget is consistent with all of the considerations which I have just discussed. It is based on a new military program unanimously recommended by the Joint Chiefs of Staff and approved by me following consideration by the National Security Council.” In essence, Eisenhower summarized all of the previous year’s efforts by saying atomic weapons formed the core of national defense; their use allowed for efficiencies in manpower, mainly from the Army; air power from two services would receive priority; and all of the Joint Chiefs agreed to this. Ridgway was outraged by Eisenhower’s declaration:

As one member of the Joint Chiefs of Staff who most emphatically had not concurred in the 1955 military program as it was presented to the people, I was nonplused by this statement. That fact is the 1955 budget was a ‘directed verdict,’ as were the Army budgets for 1956 and ’57. The force levels provided in all three were not primarily based on military needs. They were not based on the freely reached conclusions of the Joint Chiefs of Staff. They were squeezed between the framework of arbitrary manpower and fiscal limits, a complete inversion of the normal process.

Congressional hearings on the FY 55 budget started in February 1954. In successive sessions, the Secretary of Defense, the Chairman of the Joint Chiefs, the service secretaries, and their respective military chiefs each testified about the impact of the budget on the nation’s defense and their particular service. Though the civilian secretaries appeared to support the new budget, or at least not seriously object to it, the military chiefs showed the strain of different views. Radford testified to “unanimous agreement among the chiefs.” When pressed, Radford admitted there was some disagreement, but all the chiefs eventually gave their support to the budget. Radford failed to clarify to Congress that both Carney and Ridgway had serious reservations about
the budget. Ridgway, out of loyalty to the President, did not openly express his dissatisfaction with the FY 55 budget process in the February congressional hearings. Though repeatedly given the opportunity to voice his objections, he instead gave his support to the budget. Even when pressed by the House and Senate Committees on Appropriations, he expressed his satisfaction and agreement. He never openly disagreed with the Secretary or the President on the budget results, at least in the Congressional hearings.

Instead, Ridgway used other venues to express his objections. In JCS meetings, he railed against the relegated irrelevance of the Army and openly opposed the idea that the nation retained only the nuclear option to respond to crises. Nuclear weapons were not used in Korea and that was an overt, direct attack. How could nuclear weapons be considered for an insurgency such as in Greece or against a problematic radical government such as in Iran? In public speeches, with reporters present, he aired his opinions that the Army soldier had a quality unmatched by planes or atomic weapons. He still believed that even in an era of thermonuclear war, only soldiers on the ground could achieve victory. Yet Ridgway failed to voice these views in an official, on-the-record way. Once Ridgway left Washington and addressed the public around the country, he was more blunt in his statements. This inconsistency confused his fellow Chiefs as to his real opinion and obscured his real intent of preserving the Army’s strength and capabilities.

Ridgway, and by implication the Army Staff in general, had created a situation from which little good could come. The insubordination and intransigence, as perceived by Wilson and Radford, of Army decision makers led to little compromise by either side.
The Army Chief and his deputies held their ground; no cutbacks in soldiers and no cutbacks in funding were possible, given the assigned missions. This uncompromising position, in addition to Ridgway’s public commentary on force level decisions, created an environment where Army suggestions or considerations were ignored. Ridgway’s tacit fostering of this oppositional environment contributed to the Army’s second-class status, with few supporters in Navy or Air Force blue and none in the Executive Branch. The president wanted the federal budget crafted to support the dual requirements of a strong economy and a powerful military. He also wanted a JCS that publicly supported the Administration and did not serve as a source of dissident military thought. The greatest opposition to these goals came from his own service, and from an officer who had been one of his most effective subordinates. The debate placed two Army heroes – Eisenhower and Ridgway – on opposite sides. Given their relative political positions, only one would be successful.

Ridgway was not alone in his beliefs. Two other World War II heroes also figured prominently in the debate over the New Look: James M. Gavin and Maxwell D. Taylor. They and other senior officers took up the fight against the President’s policies in an effort to balance the obvious benefits of nuclear weapons with an army organized and equipped to counter the nation’s threats. Despite a sense of irrelevance, Army leaders sought to transform their ponderous organizations, maintained since World War II and Korea, into a lighter, more powerful force.


4 Rearden, 39-43, 50-55.

6 Bowie and Immerman, 23. In addition to the military supplementals, Truman asked congress for $4 billion for military assistance to American allies, the majority of which went to European countries. The AEC also gained additional millions to increase nuclear weapons production.


8 Bowie and Immerman, 41-54.


particularly infantry divisions, were too large and required too much support. Ike believed that armored divisions would provide the best basis for countering the Soviet advantages in ground forces. Ltr, DA, ACoS, G-3, Operations, to Office, Chief of Army Field Forces, subj: Reduction in Present Infantry Division, 12 March 1952, Combined Arms Research Library [hereafter cited as CARL], Fort Leavenworth, KS.

11 Eisenhower, 128; Bacevich and Kaplan put the defense-related spending at 62% of the FY 53 federal budget.


13 Eisenhower, 86. Wilson biographer, E. Bruce Geelhoed, believes Wilson was chosen as much for his ability to run a large corporation, as he was for his inexperience in military affairs. This allowed Eisenhower to be the true Secretary of Defense. E. Bruce Geelhoed, Charles E. Wilson and Controversy at the Pentagon, 1953 to 1957 (Detroit, MI: Wayne State University Press, 1979); Kinnard, The Secretary of Defense, 48, supports this analysis.

with the other service chiefs on matters relating to the Marine Corps starting in 1952. He
did not become a full member and gain a vote on the JCS until 1978.

15 Hogan, 406-410.


18 Hogan, 410-411; Robert J. Watson, *The Joint Chiefs of Staff and National Policy,
1953-1954*, (Washington, DC: Historical Division, OCJCS, 1986), 67-69; Ambrose, 513-
514, notes Eisenhower’s early objections to a large military, even denigrating the current
tank development program.

19 Dwight D. Eisenhower, *Public Papers of the Presidents of the United States, 1954*

20 Ridgway, 288-289.


22 Ridgway, 286-302, is full of his opinion yet lacks the references to his official views;
Jurika, 327-330, captures Radford’s confusion over Ridgway’s stance. Mrozek, 269,
alludes to Air Force Chief of Staff Twining’s discomfort over Admiral Carney’s “tirades”
on defense policy and, by implication, would have included Ridgway in the apparent
displeasure heaped on Carney by the Administration. See also Andrew J. Bacevich, “The
Paradox of Professionalism: Eisenhower, Ridgway, and the Challenge to Civilian
CHAPTER 2

THE ARMY’S NEW LOOK

As the Army receded in strategic relevance compared to the Air Force and Navy, the Chief of Staff and other senior Army leaders continued to debate the best response to the anticipated Soviet assault on Western Europe. The most acceptable answers focused on a mobile, hard hitting force, equipped with powerful weapons, that could oppose Soviet advances long enough to allow either a diplomatic resolution, an Air Force delivered knock-out blow, or sufficient Army build-up and offense to prevent Soviet domination of the continent. The U.S. Army had to be the initial force to stop the Soviets because the NATO allies were not prepared to do so in the mid-fifties and the U.S. Air Force could not stop the Soviets without turning the entire European continent into a nuclear wasteland. Ridgway and his senior leaders were convinced that a better organization existed than the current triangular division to accomplish this goal; their challenge was to create and implement it.

One way that Ridgway sought to achieve this goal was to take advantage of the President’s decision to allow for the planned use of tactical nuclear weapons by all the services. This enhanced the Army’s interest in the technological developments of smaller
weapons for integration into Army plans and restructuring efforts. It also allowed a
greater voice for the Army as a whole in nuclear operations. Though Ridgway
maintained his opposition to the policies of the Eisenhower administration’s advocacy of
massive nuclear retaliation, he understood that his service had to adapt to the changing
strategic environment. He continued to believe that a balanced mix of conventional and
nuclear forces could best respond to the nation’s threats.

With NSC 162/2, nuclear weapons were now part of each service and tactical
versions were soon to be shared with the Cold War Allies. Atomic information was
readily available and officers were being trained to understand the effects of atomic
weapons and to plan for their wartime use. In fact, NSC 162/2 shifted nuclear planning
from an Air Force-dominated planning cell to a requirement for all services to plan for
their use. Small nuclear devices – tactical weapons in defense industry parlance – had
been tested by the time Eisenhower was inaugurated. Most notable was the 280mm
artillery gun that fired an atomic projectile 17 miles. Nuclear tipped missiles were also
on the horizon, the Corporal, Sergeant, and Honest John leading the way. Ridgway
benefited from the work of his predecessor, General J. Lawton Collins, who created a
number of standing committees to examine the impact of atomic weapons on
organizations, tactics, and doctrine.¹

The Army had been investigating the strategic and tactical implications of atomic
weapons since 1945. However, security concerns kept almost all information on a strict
need-to-know level and very few line officers knew any details about the bomb; very
little information was released in the late forties to educate military officers. It was not
until 1951 that information was made available to those charged with planning for and
employing nuclear weapons.² After 1951, field army and corps planners could finally get useful information to design effective campaigns and operations, but the process of integrating atomic weapons into the Army’s education and training system was slow. There was considerable room for speculation by concerned officers. Indeed, there was a significant body of military thought on the use and effect of atomic weapons in the Army’s professional journals and schools during the early fifties.

The primary journal of the time, Fort Leavenworth’s Military Review, provided a forum for officers to express their concerns and ideas about atomic warfare. From 1945 through 1954, forty articles in the Command and General Staff College’s (CGSC’s) journal focused on the impact of atomic weapons.³ Writers were concerned with the effects of atomic weapons on tactics, unit organization, logistics, force structure, manpower, and operations. Considering the dearth of information on the bomb and its effects, these articles show that there was a great deal of independent and innovative speculation on the subject. In addition, Military Review featured news snippets, editorials, and short commentaries by leading military and civilian analysts that further disseminated information about atomic warfare.⁴ The quantity of student instructional hours also increased at CGSC as the fifties lengthened. By 1954, the curriculum had expanded to include instruction on tactical employment of atomic weapons, radiation downwind fallout determination, and weapons characteristics. All U.S. students received the basic instruction, with selected students receiving more focused, and more classified, instruction.⁵ More significantly, Fort Leavenworth was not alone in its discussion of atomic challenges.
At the branch schools, atomic discussion and instruction was also ongoing. In the Armor School at Fort Knox, Kentucky, the Artillery School at Fort Sill, Oklahoma, and the Infantry School at Fort Benning, Georgia, articles in their respective professional journals appeared as early as 1951, reflecting the growing interest in atomic topics.\(^6\) A few hours of instruction on atomic weapons started at about the same time. Eventually, each school devoted significant time to special weapons instruction that provided lieutenants and new captains – many fresh from Europe and Korea and enroute to company and battery command – with the latest information on atomic warfare. The Fort Knox instruction included classes on the offensive and defensive use of atomic munitions; Fort Benning’s instruction was similar.\(^7\) The effect of these new classes was to make sure that by the time officers arrived at the Army’s mid-level professional school – Fort Leavenworth’s Command and General Staff College – they had acquired at least a basic understanding of the effects and possible uses of atomic weapons. The CGSC curriculum was increasingly modified to stress the integration of atomic weapons into large-unit operations at the divisional and corps level.

At the same time that the captains and majors were first receiving a basic instruction in the capabilities of atomic weapons, the senior officers, lieutenant colonels and colonels at the Army War College (AWC), were seeking to incorporate them into a coherent strategy for their service. As part of the instruction, War College students were required to write an essay over the course of the year that covered a strategic concept. Many wrote on such topics as the proper divisional organization for atomic conflict, or a possible scenario for atomic war in the 1960s, or the impact of atomic weapons on strategy.\(^8\) Their thoughts generally reflected the concerns at the general officer level:
how can the Army participate in an atomic war on the Eurasian landmass? Thus when
Ridgway sought to challenge the Administration’s reliance on massive retaliation and the
Air Force, he could rely on an officer corps that shared a broad understanding of the
effects of atomic weapons and could draw on nearly a decade of Army thought on atomic
warfare. What was lacking was a common understanding of how atomic weapons would
be incorporated into Army operations, the technology to make these weapons available,
and a war fighting organization to practice it in peace and implement it in war.

In addition to inheriting an educational system increasingly focused on
developing a role for the Army in atomic warfare, Ridgway also inherited an on-going
effort to reorganize Army tactical units.9 As a greater understanding of the new weapons
developed, leading Army officers recognized that air- or missile-delivered atomic
weapons would have wrecked havoc on the concentrated Army division of World War II
and Korea.10 The challenge for the Army leadership was to find a method of
reorganization that nor only capitalized on atomics, but also created units that were
capable of responding to Soviet advances worldwide, though particularly in Europe.
NATO requirements demanded more Army involvement than the six ground divisions
currently stationed in Europe. Army Field Forces (AFF), AWC, CGSC, and service
school staffs undertook the study of alternative means of organizing to incorporate
nuclear weapons, yet remain flexible enough to be dispersed on the atomic battlefield and
structured to deploy to Europe and elsewhere quickly.

Meeting in March 1951 at the Pentagon, representatives of Department of the
Army, AFF, and the Army service schools debated the “Probable Effects of Atomic
Weapons Developments Upon the Structure of Army Operations.” The conference

33
addressed “the apparent urgent requirement for an immediate study of the impact of atomic weapons developments upon Army organization, doctrine, tactics, and logistics.” Among the issues discussed were the development of smaller, lighter atomic bombs, the new 280mm atomic cannon, the growing access to information concerning atomic weapons effects, and organizational impacts. Because so much information was becoming available, responsibilities for organizational changes, education, and combat developments had to be established. In addition to classified discussions of weapons capabilities, the conference assigned responsibilities for further atomic indoctrination. AFF, the headquarters responsible for units in the United States, was designated for most of the work since it controlled the educational and combat developments systems. Major General Robert M. Montague, Deputy Chief of AFF, was given the additional responsibility of combat developments chief and coordinator of the Army’s efforts at technological improvements. All of the service schools were now required to revise their instruction to include lessons on atomic warfare, and field maneuvers conducted by AFF were to include atomic war scenarios, with Exercise SOUTHERN PINE in August 1951 to be the first such exercise. AFF was also tasked to coordinate a study from the service schools on the tactics and techniques of infantry, artillery, and armor atomic operations.

Among the most interested participants in the conference was Army Chief of Staff Collins, whose experience shortly afterward revived many of its issues. On a trip to Army commands in Europe, Collins found two of his top commanders in strong disagreement. Lieutenant General Manton Eddy, 7th U.S. Army commander, supported the current infantry regimental organization and opposed any significant reduction to existing combat units. If the Army had to make manpower cuts, they should come from
upper headquarters or support troops or, most preferably, from troops in the continental United States and from the Communications Zone in Europe, not from the fighting units. In contrast, Major General John Dahlquist, commander of V Corps, recommended deletions that took over 2,000 slots from the division, including cuts in artillery units, infantry weapons platoons, and tanks. The Eddy-Dahlquist controversy is indicative of the disagreements among senior Army leadership over force structure and organization.

Collins received little help from his senior headquarters and officers, most of whom seemed stuck in the opening days of the Korean War. Responding to the Dahlquist proposals, the AFF Chief of Staff Major General William S. Lawton noted, “Combat in Korea has not, to date, uncovered any basic weakness in the structure of the Infantry Divisions as currently organized.” Even within the Army’s G-3, there was no impetus to accept the recommended changes, only guidance to continue studying the proposals. The field exercise program, key to assessing the benefits of change, was also difficult to manipulate. General Mark Clark, Commander of Army Field Forces, was supposed to include atomic play in Exercise SOUTHERN PINE but could not properly coordinate the additional requirements. It seemed that the senior level of Army leadership, excluding the Chief of Staff, were either reluctant to accept new ideas on organization or were too myopic to see the wider influences of DoD reductions.

AFF eventually coordinated its training requirements and Exercise SNOW FALL, conducted in January-February 1952 in northern New York, was the first exercise to include atomic play. The exercise directive listed the purpose as: “planning and executing offensive and defensive operations to include defense on a wide front, tactical
employment of and defense against atomic weapons, and night operations.” This was a secondary purpose behind the primary objective of large-scale maneuver training in winter conditions. Even with this level of emphasis, the exercise director, Lieutenant General Willis D. Crittenberger, 1st U.S. Army Commander, warned: “As successful as these 2 simulated employments may have been, I must caution against accepting the atomic weapon alone as the final answer to all warfare. Tactically it must be used in combination with maneuver to either defeat or destroy the enemy.” The implication was that ground forces had to be able to maneuver around the battlefield to take advantage of atomic weapons. The greater implication was for swift movement since the effects of atomic rounds could be transitory. More study was needed to assess the requirements of rapid movement in the ground divisions.

Following SNOW FALL, AFF added atomic requirements to subsequent exercises. Exercise LONG HORN, conducted May and June 1952 in central Texas, listed its purpose as “To train Army and Air Force units in planning and conducting large scale offensive and defensive operations, night operations, defense on a wide front and tactical employment of defense against chemical and atomic weapons.” Despite this mission, the exercise director, Lieutenant General William H. Hoge, 4th U.S. Army Commander, concluded that atomic weapons would have little effect on the battlefield: “Our present tactics, organization, and techniques require minor adaptation for the employment of the atomic weapon. Our communications facilities are adequate. Our doctrines are sound. I think we should reach the conclusion, and it should be developed among all levels that the atomic weapon is merely another weapon. It is more severe.”

36
The more significant issue for Exercise LONG HORN was that it appeared to
demonstrate the superiority of a new armored division organization, implemented as part
of the Korean War build-up. This new organization, indeed the activation of the 1st
Armored Division itself, was the result of the need to protect Europe from the large and
heavily mechanized Soviet armies that threatened invasion. The division’s commander,
Major General Bruce C. Clarke, reported its structure resembled the “light” armored
divisions of World War II in their combat command and unaffiliated battalion structure.
According to Clarke: “the organization of the division proved to be as flexible in practice
as it was in theory and these shifts [of battalions between combat commands] were made
expeditiously and without confusion, even during periods of radio silence and blackout.”
The simulated atomic attacks were not very dangerous because the division was “so
widely dispersed that it did not at any time present a profitable target.” Finally, he
summed up the benefits of the new organization as: “the basic design of the division is
well abreast of the modern broad-front, fluid-situation, tactical-atomic-weapon type of
warfare.” Clarke was sincerely convinced of the benefits of the combat command-
separate battalion method of reorganization; it provided a division commander with the
freedom to organize his forces as necessary to fight any enemy. The rejection of the
traditional, infantry-centric regimental organization – so valued by Eddy in Europe – was
complete and unequivocal in Clark’s mind.18

While the idea of testing new doctrines and organizations as part of an exercise
was not new, the idea of designing an exercise to specifically test the ideas was. Previous
exercises were meant for training the units involved, either prior to deployments or as a
result of activation. However, starting in 1952 with Exercises SNOW FALL and LONG
HORN, atomic considerations entered into the exercise objectives and slowly became a primary purpose for holding large-scale maneuvers. Though FY 53 did not support any large-scale exercises in the United States, the Army staff reevaluated the process of training exercises and produced an improved program of events for FY 54. The premier event in that program was Exercise FLASH BURN, conducted in April and May 1954, in the vicinity of Fort Bragg, North Carolina.

By the time of this exercise, significant changes were working through the Army. The 280mm atomic cannon had been developed and was soon to be deployed to Europe and the Far East to provide the nuclear punch for NATO and Far Eastern Command. New and more powerful types of rockets, such as the Honest John and Corporal, designed for both conventional and atomic warheads, would soon appear. Sandia Base, New Mexico, taught several courses for officers on atomic weapons; one course lasted four weeks and trained an officer to fully evaluate the employment of tactical atomic weapons. The Command and General Staff College at Fort Leavenworth designed a course to teach “Special Weapons and Tactics” and several classes of staff officers, trained in the planning and use of atomic weapons, had graduated.

After FLASH BURN ended, the summary discussion by the senior participants indicated some were still unsure what the use of atomic weapons would mean to their service. Major General Joseph P. Cleland, Commanding General, XVIII Airborne Corps, commented: “From the experience gained in this maneuver, it is recommended that the atomic weapons be treated as another high-powered artillery piece or air arm, and the control be placed in the Fire Support Coordination Center.” While Cleland was not a forward thinker in terms of the effects of atomic weapons, he certainly voiced the
intellectual struggle among the senior leaders about the changes taking place in the Army. Major General James M. Gavin, just returned from Europe, commented during the exercise critique that the Soviets were “well-equipped with atomic weapons” and U.S. forces had to learn to use them, incorporate them into the structure, and live through atomic use on the next battlefield. His focus was on developing the structure and organization to capitalize on dispersion, concealment, and mobility. Gavin’s comments were echoed by the Chief of AFF, Lieutenant General John Dahlquist, who said: “the fallacy of unilateral planning for the employment of these [atomic] weapons was apparent. There is an urgent need for crystallization of joint doctrine in this field, and we will intensify our efforts, at Field Forces, to accomplish this.” He went on to indicate that the “integration of atomic weapons support with ground force tactics is still in its infancy.” More study was required to integrate atomic weapons into organizations, training methods, and strategic planning.²⁰

Ridgway was also present at the exercise critique and presented the assembled senior leaders with a challenge: “The integration of these new weapons into the old will bring increased facility, and increased capabilities. The development of these weapons will have a tremendous impact on our tactical organization because of the new techniques we have been testing here. If a new weapon or technique isn’t sound we are not going to exploit it. Eternally, we must be shifting and readjusting our principles of war to the endlessly changing conditions of war.” Supported by Gavin and Dahlquist, Ridgway reinforced the idea that atomic weapons had a significant impact, far beyond the explosion and fall-out. New methods of protection and movement had to be developed,
new techniques for communicating, and new tactics had to be developed. Almost all of these requirements fell within the purview of Dahlquist’s Army Field Forces.\textsuperscript{20}

Thus, as Ridgway entered his second year as Chief of Staff, the belief that future war would be based on atomic weapons was germinating among the Army’s leadership from top to bottom. But, beyond rejecting the Air Force’s concept of an aviation-only strategic nuclear attack against the Soviet Union’s industry and population, there was still disagreement over the role of atomic weapons. Some leaders saw the strategic view for the potential use of atomic weapons as a means to equalize the imbalance in Europe between the Soviet Union and NATO. Others saw the tactical improvements in weapons, vehicles, and equipment that made their lives safer, their profession more efficient, and their work more effective as a result of the atomic focus. With these ideas of progress bubbling through the Army educational and training systems, the only thing lacking was a catalyst to bring the ideas together at a high level and force the Army’s leadership to look at change.

Fortunately, one of Ridgway’s former subordinates was now on the Army Staff and he had spent considerable time thinking about nuclear warfare, Army divisions, and reorganization. Lieutenant General James M. Gavin became the Assistant Chief of Staff for Plans and Operations, G-3 in March 1954. Previously serving with Ridgway in World War II, Gavin had commanded the 82d Airborne Division after Ridgway was promoted to XVIII Airborne Corps command. In 1952, they were both in Europe; Ridgway was SACEUR and Gavin commanded VII Corps in Southern Germany. Though no close, personal relationship existed between the two, their partnership in World War II airborne operations yielded a common identity.\textsuperscript{21}
While in Europe, Gavin had the opportunity to work out several ideas he had been mulling over since his recent assignment on the Weapons Systems Evaluation Group, a DoD weapons development study group. As a member of the scientific body, he gained an appreciation of nuclear weapons, actually attending several atomic tests. He participated in evaluations of nuclear weapon use in Korea in 1950 and also provided military advice to Project VISTA. Formed in 1951 to analyze future warfare under nuclear conditions, VISTA’s “purpose was to conduct a broad study of ground and tactical warfare with particular attention to the defenses of Western Europe in the immediate future.”22 Insights gained from WSEG and VISTA indicated to Gavin that the massed armies of World War II were too vulnerable to nuclear weapons; army tactics and organizations had to change. As VII Corps commander in southern Germany, he had “the opportunity that I had been seeking to develop tactical nuclear concepts for our infantry organizations.”23

As part of planned exercises, the VII Corps staff deployed units to their planned defensive positions, analyzed the impact of a 50-kiloton nuclear bomb and then rearranged units so they would be outside of the “median lethal distance from ground zero” (nominally 2 ½ kilometers for a 50-kiloton bomb). “We learned that it was entirely practicable to provide optimum defense with a quick tactical responsiveness to an attack in a two-sided nuclear war provided certain steps in reorganization were accomplished.” Gavin projected that the best organization required protection from the nuclear effects, significant mobility, and a greater communications ability than currently existed. The exercises, BATTLEMACE and BEAR TRAP, demonstrated the ineffectiveness of the current infantry divisions in a nuclear war. Not only was reorganization necessary, but
also the replacement of cannon artillery with missile artillery and the development of an “air logistics organization” were essential.  

While the VII Corps staff continued to work through the implications of the exercises, the 1953 stateside exercise program also had Exercise SPEARHEAD slated for the 1st Armored Division at Fort Hood, Texas in May 1954. The exercise was designed to “determine the feasibility of reduction or adjustment of personnel and materiel in the armored division without reduction or impairment of combat efficiency, present basic structure, or mobility.” In addition, other tests were implemented to see the impact on operations when the combat command system was adjusted in personnel and equipment, new equipment such as the M48 medium tank and the M59 armored personnel carrier were employed in tank and armored infantry battalions, and resupply took place through air-drop. As with previous larger-scale exercises, SPEARHEAD included scenarios that used atomic weapons. The exercise demonstrated that some reorganization of an armored division could save manpower and not affect the division’s ability to accomplish its mission.

Now as the Army’s operations chief, Gavin’s duties included plans and training for the Army in the mid-fifties as well as projections for the future Army. His experiences as VII Corps Commander became very relevant in his current assignment. Given the opportunity to affect the future Army, Gavin was in the position to use the results of his own experiences with BATTLEMACE and BEAR TRAP, as well as SPEARHEAD, to make recommendations and proposals for reorganization.

Ridgway directed Gavin’s staff to study reorganization proposals, even as he continued to fight the other service chiefs for greater Army funding. By the end of 1953,
the Army chief perceived four salient points about the future. First, nuclear weapons were here to stay and had to be incorporated into the Army’s doctrine, organization, and training. Not only did the other services have them, and base most of their funding on nuclear items, but also American defense of NATO nations relied on nuclear weapons. Second, despite his best and continued efforts, Ridgway could foresee continued reductions in manpower. Ridgway had to prepare for these cuts while simultaneously maintaining a trained and ready Army. Third, the Reserve Component of the Army, the National Guard and the Army Reserve, were not effective, combat-ready forces. Both had been affected by the reductions from Korea as well as the recent budgetary shortfalls. Their decline was precipitous; neither was manned, equipped, nor trained for use as they had been for Korean service, only two years earlier. Yet most Army plans for responses to Soviet moves called for the use of Reserve Component divisions. Last, Ridgway faced ever-increasing demands on his forces. The Chinese off-shore islands crisis projected the use of Army divisions; any Indochina intervention did the same. Lesser actions in the Middle East, Central America, and South America also occupied Army units.

These considerations drove Ridgway to direct AFF to conduct a “long-range study . . . with the objective of forecasting the probable organization of the Army during the period FY 1960-1970.” The study was to focus on the field army “and it components, the communications zone and units thereof, but will not consider over-all Army strength or worldwide deployments. However, the concept of operations should be based upon sustained operations on the Eurasian land mass.” The guidance went on to define the necessary assumptions for the study. AFF should define the “minimum requirements” for atomic weapons, with authority to employ them already granted. The Army would
have surface-to-surface guided missiles, atomic artillery projectiles, and atomic-tipped free rockets. AFF should also assume that “the enemy will also be in an age of relative atomic plenty,” though the U.S. maintained a relative superiority in quantity and quality. This very significant directive began the real work of AFF and CGSC in creating the new organizations to fight in an atomic war in Europe. Ridgway’s guidance focused the organizational developers in AFF on creating units, from companies up through the field army, which would fight in Europe in an atomic war. The use of atomics weapons by both sides was the starting point for any serious study of new organization and structures. Ridgway wanted an answer “as expeditiously as possible consistent with valid conclusions.”

AFF quickly directed CGSC to develop proposals based on Ridgway’s guidance. Simultaneously, it also directed the Infantry and Armor Schools to assess alternatives for the current infantry and armored divisions, respectively. In the directive to Fort Leavenworth, this method of creating responses was explained as a “desire to develop the problem on the broadest possible base in its initial stages;” CGSC would of course receive the service school studies. The AFF guidance, which amplified the Chief of Staff’s, directed the developments of organizations that reflected “maximum personnel economy” and the “reduction in numbers and types of weapons.” The deadline for the proposals to AFF was set at 1 March 1954. As an aid to CGSC, AFF also appended a study from the DA G3 Plans Division that could “prove of incidental value in the development of your study.” That study, dated 19 November 1952, was remarkable in its vision and predictions.
The study was titled “Reduction in Infantry Division.” Its premise was that the current (1952) infantry division was an excellent organization, but was too unwieldy for mobilization and operations around the world. The Plans Division proposed that the division could be reorganized by “reducing the overhead,” “eliminating or reducing the number of lesser weapons and items of equipment,” and “regrouping or reducing the number of essential weapons.” The justification for making this reorganization would echo through the rest of the fifties:

The smaller division might be justified by the greater number of divisions made possible thereby; a need for simplification of organization and equipment; or by a reasonable certainty of where and under what conditions the division will fight. A smaller division with more flexibility for organizing combat units of combined arms is certainly attractive, in view of the necessity for dispersion to counter the effectives of mass destruction weapons. Not only could the entire division be moved more quickly, but the smaller and more compact units of combined arms would be less vulnerable to atomic attack and could be moved more quickly to threatened points. If the over-all effectiveness of the Army with the smaller divisions compares favorable with the current effectiveness, the new divisional organization should be adopted immediately.\(^{32}\)

The Plans division proposed that the new divisional organization should consist of “five basic maneuver elements” defined as five battalions of five companies each, with a strength of 1,300 per battalion. The division strength was approximately 12,000, with the basic units of armor, artillery, and support trains organic to the division. In late 1952, this proposal was not well received by either of the other two sections in Army G3. Operations Division feared the infantry division would simply become a division of five battalions with no additional increase in either firepower or maneuverability. Organization and Training Division judged that the present organization of three infantry regiments was better because it was more flexible in combat, was easier to train in
peacetime, and was simple to understand; why change something that worked well? All of the paperwork associated with the Plans Division proposal, including the comments from the other divisions, was sent to the G3 in November 1952 where it died a quiet death of staff inaction. No reference was made to it again until January 1954 when it surfaced in AFF as a proposal for CGSC to consider while responding to the Chief’s requirement for a new organization. The remarkable nature of the G3 Plans Division proposal was its reference to and justification for five basic fighting units. The evolutionary nature of the proposal may have been too much to comprehend in late 1952. Fifteen months later, it may have worked as a point of departure for those at CGSC tasked to create a new organization.

From January to April 1954, CGSC, the Infantry School and the Armor School examined methods and proposals to modify the division organization. By April, however, the Chief of Staff decided to focus their efforts more clearly, with a definite deadline. Ridgway knew that reorganization could provide more firepower, more mobility, and less vulnerability than currently existed. He indicated to Dahlquist that: “organizational possibilities exist which will permit the formation of combat units which are more mobile and flexible and less vulnerable to atomic attack.” He also reinforced that “the Army commander is assured the use of available atomic weapons support.” In-place units, capable of meeting the FY 57 requirements, were the basis for planning; no increase to Army strength was to be contemplated. The intent of Ridgway’s guidance was to assess current infantry and armored division organizations, make changes, test the changes, and implement the new structure by 1 January 1956, just eighteen months away. Most interestingly, the chiefs of administrative and/or technical services would not be
consulted, rather they were told how and what support to provide to the reorganized divisions. This was a very ambitious effort, but one that had the support of the Army Staff and AFF. Such an effort at reorganization undoubtedly capitalized on the current efforts to revise divisional structure, but it also attempted to affect structures above the division at corps and field army. The effort became known as the “Atomic Field Army (ATFA) Study”. Army Field Forces tasked the Command and General Staff College at Fort Leavenworth to conduct the study, and in May 1954, CGSC’s study directive established an ad hoc committee of instructors and doctrine writers to create the necessary changes for the two divisions. Not only was this mission the top priority for Fort Leavenworth, the provided guidance was to be accepted as gospel. Any disagreements could be aired after the project was complete. The directive nature of the study mirrored the emphasis from Ridgway that the Army move immediately to develop an organization for atomic war.

The CGSC ad hoc committee was divided into four subcommittees. One was responsible for the infantry division structure, down to and including separate companies within the division support command. The committee had to prepare organizational concepts, wire diagrams, probable missions and methods of operation, and divisional doctrine for the infantry; another committee did the same for the armored division. Both Committee A and B had to produce this work and send it out for comment to the respective service schools within two weeks. Committee C had responsibility for the combat support for each division and was required to work closely with the two divisional committees. It was also to prepare doctrine for all of the higher echelon units: theater army, army group, field army, and corps. Their deadline was to publish guidance
seven days after the original directive’s publication date. Committee D assessed the administrative functions of the two divisions as designed by Committees A and B as well as assisting Committee C in their development of the higher echelons.

Reaching outside the bounds of traditional thought, the ATFA study restructured the World War II regimental organization and reoriented it towards the combat command approach used in most of the armored divisions. It created specific headquarters companies designed to provide tactical command and control for the subordinate battalions. Attached to these headquarters were the infantry and armor battalions deemed necessary for a particular mission. The only organic element to the combat command was the headquarters company; all other units were attached. In essence, the battalion became the unit of action rather than the regiment; all administrative, logistical, and maintenance functions now had to pass through the battalion rather than the regiment. The regimental headquarters, which had been organized to handle all these issues for its subordinate battalions, was abolished. The varied support functions were, in some cases, pushed down to the battalions, but most support requirements were now passed up to division for action. This was a significant departure from the regimental system that had served the Army for decades, but it was not without basis. The combat command had proven its flexibility and adaptability for atomic war during Exercise LONG HORN and SPEARHEAD, but in its armored division form. No infantry division had tested the new organization and now CGSC was proposing its use in all divisions. Remarkably, though, the first hint of the combat command acceptance within the infantry community came from Fort Benning.
The Infantry School had already responded to an AFF tasking and recommended that the battalion should become the basic unit of action vice the regiment. The School’s report concluded: “establishing the battalion as the basic combat unit . . . gives a flexibility commensurate with atomic age demands; that mechanization is essential to dispersion and mobility required in 1960; and provides a bonus in personnel economy.” Additionally, they argued that only by becoming almost completely mechanized would combat forces be able to fight, maneuver, and survive on the atomic battlefield. Indeed, this was a significant step forward. Establishing the battalion as the basic fighting unit meant it would be the organization commanders shifted around the battlefield and not the regiment, as had been true previously. If the battalion became the basic unit, higher headquarters were necessary for command and control only; supply and administration functions could be shifted to the battalion or to a higher echelon of command for consolidation. The recommendations of the Infantry School report were also prescient in their plan to adopt a common chassis for the fleet of vehicles within the division and the establishment of three subordinate tactical headquarters for the division. Both at an AFF meeting in February 1954 to discuss the organization of the Army in the coming decade and at subsequent meetings, the Infantry School’s recommendations were accepted without serious comment. The apparent support for the end to the regimental organization from the Infantry School seemed to smooth the introduction of the Fort Leavenworth combat command proposal.

With the combat command organizational blueprint distributed, CGSC’s ATFA subcommittee writers examined each division’s doctrinal missions. As they saw the infantry and armored divisions, the traditional missions of attack, defend, exploitation,
and pursuit would not change. In fact very little changed doctrinally from current perceptions and procedures from the old to the new organization. In their haste to get information out to the subordinate branch schools, the CGSC directive provided little guidance in the way of any new doctrine for their proposals. Rather, the Leavenworth writers retained doctrinal responsibility for the division headquarters company and the support command headquarters battalion. The branch schools, tasked with the organization and operation of the combat commands, were required to provide the doctrine, tactics, techniques, and procedures for the combat commands and for their subordinate battalions. It was not foreseen that new battalion-level doctrine would be required for the infantry, tank, or armored infantry battalions.37

Conversely, the logistical and administrative basis for the proposals changed existing doctrine significantly. In the proposed ATFA divisions, the consolidation of the higher levels of support within the division created the division support command; the functions of administration, supply, and maintenance in combat battalions were only those that pertained to the soldier or his piece of equipment. The infantry division support battalion was the headquarters for personnel support, supply and transport, medical requirements, and maintenance. Many of these functions were performed by battalion-sized units in the armored division and worked under a support command rather than a support battalion. This was due to the increased need for maintenance and supplies associated with armored vehicles.

The new support commands were drastic changes for most senior officers. To lose the non-combat elements of a combat command meant those elements were no longer under the commander of the unit that needed them. The combat command
commander had to turn to the division support commander for any maintenance, supply, or administration that exceed the capacity of his battalions. In essence, with the ATFA-1 organization, the managers of these combat service support functions only responded to requests for assistance rather than orders for support. This was a heresy to which many senior officers objected; the old regiment was always self-contained. With the combat command organization, issues such as timeliness of maintenance, supply priorities, and responsiveness became very important. Trust between combat arms officers and service support officers became essential. Clearly, the relationship between the supported combat commander and the service support commander was now key. The resulting division was intended to be more integrated than ever before; the advantages should have been obvious to all.

However, changes within the division support command created a unit with a large span of control and responsibilities that were new to many service support officers. Despite their new level of authority over division supply and services, there was certainly some trepidation among the logisticians now responsible. The creation of a support battalion for the infantry division put a service support officer in charge of the disparate subordinate companies. This required a transportation battalion commander to have a working knowledge of medical company operations, something he had never been required to do. It also required the support command staff to work hand-in-glove with division operations to provide timely and anticipatory support to the division’s combat commands.

In addition to the new support command organization, other changes took place within the subordinate units. To increase the division service support capabilities, the
transportation and supply organization, a company for the infantry division and a battalion for the armored division, were each modified to add more trucks, thus giving the support command greater flexibility in moving supplies and troops. The maintenance battalion in each support organization increased to include more mechanics and a greater capability to repair the base division’s equipment rather than having to send it to higher echelon maintenance units. The armored division’s medical company was equipped with armored carriers so the treatment and recovery teams could go forward with the armored combat units to perform their services. 38

While these organizational changes took place in the units of the division support command, a more significant change took place in the division’s signal unit. The previous signal company was increased to a battalion, more directly as a result of technology than greater organizational efficiency. New technology, such as the transistor, allowed for greater communications capabilities; organizational changes were proposed in the ATFA blueprint to take advantage of that. 39 The new battalion’s three companies established a grid network across the division’s area of operations with a series of radio relay stations and wire or cable link-ups. This new method of operation allowed any station within the division area to communicate with other stations, regardless of where that station moved. The battalion’s Command Operations Company kept the division headquarters elements linked together as well as the division support command and the division artillery. The Combat Operations Company operated farther forward – in armored vehicles – to link the combat command headquarters with the division headquarters and the division combat support and service support units. The effect of the new signal organization was to facilitate division operations across the
dispersed atomic battlefield. With better communications, the speed with which a
division commander could direct tactical operations was increased, the adverse effects of
dispersion were overcome, and moving battalions within the division area in response to
enemy actions occurred faster.

These changes represent a significant shift from the traditional division
organization, especially for the infantry division. Gone were the days where infantrymen
slogged across battlefields in a near continuous line. Based on the assumptions of
nuclear war, soldiers had to be dispersed across the battlefield to avoid presenting a
lucrative target for atomic weapons.\textsuperscript{40} The dispersion was only possible if flexible
headquarters below division level were created to control the combat organizations;
regimental headquarters were not acceptable because they appeared to be inflexible. The
combat command – modeled on the armored divisions of World War II – created that
flexibility. To control these new formations, different radios were required. New
technology, such as the transistor, created the opportunities to enhance military
communications. New radios had more power, a wider range and were used across the
division area of operations, unlike the previous vacuum-tube radios. The radios were
approaching the point of being ubiquitous within the division. Other new equipment
included the armored protection the medical evacuation squads enjoyed. That protection
came from the new armored personnel carriers that units in the Korean War tested.\textsuperscript{41} All
of the new equipment and techniques for employment came together under AFF’s aegis,
and Fort Leavenworth’s authorship, in the ATFA-1 Project.

As the project developed some problems arose. CGSC’s ad hoc committees
received feedback from the service schools that conflicted with the ATFA planning
guidance. Typical of that feedback was the problem Committee A dealt with concerning the infantry division. The committee met its deadline and sent its specific guidance to Fort Benning by 11 June. Fort Benning responded within the month that the division organization was lacking. Its most significant comment was its recommendation against the elimination of the regimental headquarters, a notable turn-around from their January 1954 report. After a lengthy exposition about infantry regiments and the recommendation to establish a regimental depot system, the Infantry School indicated: “the new organizations, in many cases, do not completely agree with proven, sound concepts or methods of employment of current organizations being taught at The Infantry School.” This comment again indicates the difficulty Ridgway had with implementing innovative ideas. Despite Ridgway’s rather clear guidance and CGSC’s repetition of it, the Infantry School apparently did not understand that the ATFA-1 infantry division was not supposed to look like the current division nor was it designed by CGSC to operate in exactly the same manner. While the fact that it did not match current teachings at Fort Benning should have been intuitively obvious, that fact was lost to the Infantry School project officers. Other service schools responded with objections more or less in the same vein: the ATFA-1 concept was lacking in some aspects of their particular responsibility.

In August 1954, CGSC published the “Mission, Employment and Method of Operation of ATFA-1 Divisions,” amplifying the initial June guidance, published when the Ad Hoc committee was formed. It described the infantry and armored division operations in the context of how ATFA-1 was coalescing around the idea of atomic warfare, dispersed operations, and combat commands. According to the guidance, the
infantry division was to be capable of close combat, to be air-transportable, and to be able to maneuver and fight in all terrain and all weather. Its divisional organization was flexible. It could organize its subordinate units to accomplish any assigned mission that required paced, methodical movement. It could accept attachment of any other combat, combat support, or combat service support unit with no difficulty. However, the primary means of mobility was still the infantry rifleman. Planning for truck unit attachments still had to be made to move the division swiftly. The division’s armored units were still intended to support the infantryman and not serve as independent units for any other mission except support to the infantry. The division was still designed as the primary large-scale maneuver unit and was still thought of in terms of foot mobility.

The proposed missions for the armored division were very similar to its existing missions. However, its missions included no close combat, only fire, shock action, and rapid maneuver. It was meant to be used for flanking movements or an envelopment force or for pursuit and exploitation in corps or army operations. It was not seen as a force operating independent of the infantry divisions of a corps, but rather as a complementary division to the infantry division. As with the infantry division, the other armored units of the division supported the primary objectives assigned to the tank units.

Both divisions were organized around three combat commands and seven combat battalions. The division artillery brigades had only medium range, 105mm howitzer battalions and a 4.2” mortar battalion, which limited somewhat the effective fires expected by frontline infantry and armor units. The supporting battalions of engineers and reconnaissance were organized along traditional lines with some modifications based
on the parent division. The signal battalion and the transportation battalion, previously addressed, were very different.\textsuperscript{43}

It will be remembered that Fort Leavenworth’s committees designed to address the ATFA-1 requirements also included a subcommittee to address the echelons above division units. By September 1954, that guidance had been finalized and published. It focused on the field army level and envisioned a theater of operations for the army with fifteen divisions (nine infantry and six armored) organized under three corps. This is essential to understand how the combat support and service support units would be organized to support the division and corps.\textsuperscript{44}

After an introduction that preached standardization, self-defense, efficiency over duplication, and mobility consistent with the potential threat, the CGSC committee’s guidance established that fewer combat units would be located behind the division rear boundaries. Gone were the days of separate tank or infantry battalions available for rear area defense. Rear echelon units were required to provide for their own security with only a “be prepared” requirement for combat units to assist. The antiaircraft requirements shifted from the point defense previously provided exclusively by guns to an area defense provided by Nike missiles. Many of the artillery brigades normally assigned to corps or army level lost cannon artillery battalions and gained missile battalions, either Honest John or Corporal. All aviation was consolidated in a corps aviation company; only division and armored cavalry regiments retained their own aviation assets. Even the corps artillery aviation shifted to the new company. Increases went to the corps engineer, transportation, and signal units in recognition of their expanded support missions.\textsuperscript{45}
Under the ATFA-1 concept, division, corps, and army area of operations increased. The infantry and armored divisions would assume a larger area because newer radios allowed command and control to be extended beyond simple line-of-sight. Missile artillery and antiaircraft artillery created a greater umbrella of coverage over a corps or army area and allowed for greater dispersion between front line divisions, reserve divisions, combat support units, and the rear area service support units. These were significant advances that promised a greater capability for U.S. units engaged in combat. Despite many reservations, the branch schools, CGSC, and AFF studies seemed to indicate that the new organizations and doctrine would work on the battlefield. All that remained was the conceptual testing in a realistic environment. That was the intent for the winter 1955 divisional exercises. When Army Field Forces briefed Ridgway on the ATFA-1 and exercise concepts, he rightly assessed that “the test of the two divisions is the most important thing that the Army is doing at the present time.”

After the organizations were developed and staffed through the various service schools and headquarters, the ATFA-1 concepts were evaluated in two major exercises in February 1955, Exercise FOLLOW ME with the 3rd Infantry Division and Exercise BLUE BOLT with the 1st Armored Division. Dahlquist’s headquarters developed the program and objectives for Exercises FOLLOW ME and BLUE BOLT, both as a direct result of Ridgway’s emphasis on new ideas and CGSC’s work on ATFA-1. The exercises were relatively small-scale events meant to evaluate the logic of the new organizations. In an example of the hasty and uncoordinated nature of the ATFA-1 effort, the two exercises were not part of the Army’s exercise program for FY55. In other words, despite the Army Chief’s belief in their importance, the responsible headquarters
performed the exercises with no augmentation in personnel, money, equipment, or time. This had an impact on the effectiveness and viability, and thus the validity, of the tests.

Among the objectives for BLUE BOLT were the requirements to: “determine the effectiveness of the proposed tactical doctrine, to include mobility, flexibility, fire support, command control and vulnerability to atomic attack;” “determine the effectiveness of the proposed doctrine and organization for logistical support with respect to a Combat Command and its normal attachments;” “determine the effectiveness of the proposed communications system to efficiently serve the units engaged in the exercise;” “determine the effectiveness of the proposed organizational structure in supporting the proposed tactical doctrine;” and to “test the capability of the ATFA-1 Armored Division to operate offensively and defensively when both sides employ limited quantities of atomic weapons.”47 The armored signal battalion was specifically tasked to practice communication centers, radio relays, remote operations, and displacement. Tank and armored infantry battalions, consistent with the CGSC guidance, were told to continue to use the same tactics, but with the new organization. Their assigned company-level maintenance was consolidated at battalion and teams were dispatched to companies as required, in line with the ATFA-1 concept. Additionally, some units were equipped with the M75 and the M59 armored personnel carriers, though they were not part of the original training plan. Units so equipped were required to determine the vehicles acceptability and functionality and to determine if “a cheaper armored wheeled vehicle or a substitute standard vehicle” could be used.48

BLUE BOLT was very successful in demonstrating the use of new communications equipment and the mobility required for an atomic war. Some of the
flexibility came from the armored division culture, already used to the combat command concept and requirements. The new signal battalion’s communications grid enhanced the flexibility of the all-armored organization. The concept worked well for the armored division and represented an evolution from current procedures. The most significant challenges were the additional personnel now integral, vice attached on an ad-hoc basis, to the combat command and battalion headquarters. The physical space limitations required more vehicles and other equipment to accommodate the modifications.

For the infantry division, Exercise FOLLOW ME represented a more radical departure. The division had to adapt to the combat command and battalion-based organization, an idea inimical to the time-tested infantry regiment concept. Among the conclusions from the exercise was: “The ATFA-1 division is more vulnerable to ground, guerrilla, air, and armor attack than the present infantry division due to an inadequate number of tanks, organic reconnaissance units, and antiaircraft weapons. There is a definite lack of security means for close-in defense of tactical and logistical installations when dispersed for defense against atomic weapons, and when dispersed at extended distances as contemplated by the ATFA doctrine. The ATFA-1 infantry division is less vulnerable to atomic attack than the present infantry division, due in the main to the extended distances resulting from ATFA doctrine.” In essence, it was concluded that the only way to overcome the problems caused by dispersal would be to add more tank units, more reconnaissance and surveillance units, and more antiaircraft artillery. This recommendation was opposite to the exercise’s purpose; the division was supposed to decrease in numbers and increase in effectiveness. Now the recommendations indicated
more was needed to make the division effective in an atomic environment. This, of course, was unacceptable.49

Both exercises were controlled and evaluated by elements of the different service schools, though each exercise was under the direction of the regional Army commander, 4th Army for BLUE BOLT and 3rd Army for FOLLOW ME. With the test purposes and objectives developed by AFF, and the evaluation performed by many of the same people who established the objectives, there was some concern over the validity of the tests. Perhaps the most significant issues came from the Operations Research Office (ORO) from Johns Hopkins University that had been tasked to support the exercises. In BLUE BOLT, the ORO report noted, “no real comprehension of atomic tactics was evidenced by the decisions and dispositions of the commanders, by unit SOP’s, by the umpires, or by the evaluators. Until atomic tactics are better understood by all concerned, there can be no real test of either the concept or the details of [Tables of Organization and Equipment].” The report from Exercise FOLLOW ME indicated much the same, “The considered judgment of ORO, after examining the plan of test was that Exercise FOLLOW ME as proposed and designed would not furnish an objective answer to the basic question: Is the ATFA-1 organization and doctrine superior to the current organization and doctrine?”50

While rightly questioning the effectiveness of the tests, the ORO’s report was not well accepted by those involved in the tests. BLUE BOLT’s Chief Evaluator, Brigadier General William H. Wood, expressed surprise at the “startling conclusions concerning the nature of the Exercise, its conduct,” and the ATFA-1 concept. Wood explained in detail his objections to the ORO report, concluding “armored leaders need no special
indoctrination or training to participate effectively on the atomic battlefield.” Even the test unit commander, Major General William S. Biddle, 1st Armored Division, dismissed the ORO report as “... largely incorrect and seems to be an unsupported opinion. The concept, as apparently envisioned by ORO, of ‘atomic tactics’ which are radically and completely distinctive from basic tactics, appears to be unsound.”

Perhaps the real significance of the exercise reports is that they gave clear indications that the Army’s military observers were unable to break free of their branch loyalties and personal experiences. Rather than evaluating ATFA-1 as a totally new division organization to fight a totally new form of war, they persisted in judging it on the basis of how well it conformed to their traditional missions. The armor evaluators, who understood and were comfortable with the combat command idea, found the ATFA-1 concepts generally acceptable. The infantry evaluators, comfortable with the regimental organization and uncertain of the combat command capabilities, made unfavorable reports on the ATFA-1 organization. The division commanders, chief evaluators, and Army commanders all maintained their branch perspectives and rendered similar comments concerning the new organization. What seemed to be an excellent application of new ideas generated eighteen months ago was now considered a contentious organization among the military leaders involved and the civilian agencies assigned to assess the exercises. Ridgway was left to his own intuition about the next step in the atomic organization process.

The good from both exercises went largely unrecognized in the final evaluation reports. For both exercises, the use of armored personnel carriers allowed the infantry battalions to move around the battlefield, under the conditions that Gavin described after...
Exercise FLASHBURN, with dispersion and mobility. Though the personnel carriers were not organic to the infantry battalions, they were part of the division in both cases and were used extensively. The capability for the required maneuvering of atomic warfare was present. Furthermore, the communications grid exercised by the new signal battalions permitted more extensive dispersion by combat battalions than hitherto experienced. No longer did units have to remain in contiguous linear formations across the battlefield front; units could afford to have some dispersion between battalions, both laterally and in depth, as long as they maintained appropriate security. The armored division organization benefited from its protection and mobility, but its test was not a radical change from its previous tactics. The infantry division experienced some difficulties with this concept and called for more forces to alleviate the problems of inter-battalion security, but generally accepted the new ideas. While the atomic battlefield challenged both organizations, the ATFA-1 concept appeared to provide a method to overcome the challenge.52

The exercise reports were appropriately finalized and AFF reviewed the results, giving Fort Leavenworth the task to correct the identified deficiencies. CGSC worked through the BLUE BOLT and FOLLOW ME exercise reports, made changes to the divisional structures, and prepared both the 1st Armored and 3rd Infantry Divisions for another exercise, SAGEBRUSH. This time, the exercise would be part of the AFF FY 56 Exercise Program and projected funds would be available for proper testing and evaluation. However, the primary focus shifted from division operations under ATFA-1 concepts to corps and field army operations under ATFA concepts. This was a different

62
focus for the evaluators as the non-divisional unit players moved to the fore for their turn
under the microscope of AFF evaluation.

At the same time that Fort Leavenworth’s ad hoc group was creating and refining
the ATFA concepts, another ad hoc group met at Army Field Forces Headquarters in
March-May 1954, under the tutelage of Major General Robert M. Montague, Deputy
Chief of AFF and Chief of Research and Development for AFF. Montague wanted this
study group to assess the Army organization from a different perspective. He directed
that all the action officers start with accepting the “rule of fives:” infantry divisions
would have five infantry battalions and its armored component would be able to split into
five supporting units; each corps would consist of five divisions; and each field army
would have five corps. The regimental headquarters were abolished, and the division had
two task forces as subordinate tactical headquarters to control the battalions. Divisional
service support assets were to be consolidated at the division support command, while
eliminating as much redundancy as possible. Montague specifically mentioned then-
Major General Dahlquist’s 1952 infantry division study as a basis for the reorganization
effort, an indication of the AFF Commander’s influence on the project.53

Thus two separate division reorganization projects were ongoing in 1954-55.
One, under the auspices of Fort Leavenworth and CGSC, produced the ATFA studies.
These studies were tested in the Army exercises for 1954 and into 1955 with the
projected Exercise SAGEBRUSH, an analysis of which follows. A second group, under
Montague and working independently of the Fort Leavenworth effort, developed a
different structure for the division. Its work was slow, methodical, and influenced by
personal involvement from the AFF Chief of Combat Developments. Montague’s
product would not be available until late 1955 and recommended a philosophically
different approach to organization.

Ltr., Secretary of Defense to The Secretaries of the Military Departments, et. al., subj.: “Policy on Investigation and Clearance of Personnel Within the Department of Defense, its Contractors, and Contractor’s Employees for Access to Restricted Data as Defined in the Atomic Energy Act of 1946,” 2 February 1951, U. S. Army Military History Institute [hereafter cited as USAMHI], Carlisle, PA, placed atomic information on the same level as other military information available on a need-to-know basis; Carter, 130-134; FM 100-31, Tactical Use of Atomic Weapons (Washington, D.C., GPO, 1951) was published in November 1951 to provide some basic information to the Army about atomic considerations. Written at CGSC, Fort Leavenworth, it was first issued under a confidential classification and then declassified after most of the information became general knowledge. See also George C. Reinhardt and William Kintner, Atomic Weapons
and Land Combat (Harrisburg, PA: Military Service Publishing Company, 1953). Both authors were instructors at CGSC.

3 Rose, 56-57. Though Rose cites the quantity of articles in Military Review, he does not indicate that only a few hours of instruction was devoted to atomic issues from 1945-1952. Starting in 1952, instruction expanded to include the classes noted in the text.

4 Many of the news snippets were newspaper articles of military interest, much like today’s Early Bird used across the government. Some authors are interesting to note for this period: BG Arthur Trudeau wrote of statecraft and war, including the threat of atomic war, when he served as the Deputy Commandant of CGSC; COL George Reinhardt had several articles as did LTC Kintner on atomic operations; F. O. Miksche wrote on refugee problems in future atomic wars; J. F. C. Fuller and B. H. Liddell Hart were also frequent contributors.


6 In Armor, MAJ Garth Stevens, “Tank Defense Against Atomic Attack,” 60, no. 2 (March-April 1951), 28-29 (MAJ Stevens worked in Armed Forces Special Weapons Program as an armor officer); editorial, “Atomic Battlefield and Armor,” 60, no. 6 (November-December 1951), 18; MAJ Lamar McF. Prosser, “The Adjustment to Atomic War,” 61, no. 1 (January-February 1952), 20-21; Secretary of the Army Frank Pace, Jr., “The Army’s Atomic Gun,” 61, no. 3 (May-June 1952), 40-41; various authors, “The Atomic Background,” 61, no. 4 (July-August 1952), 6-12 (contains excerpts from press releases and speeches by the Secretary of the Army and the Chief of Staff on the future of

Army Service Schools, Volume II, Fort Leavenworth, KS, 13-16 November 1951, USAMHI, Carlisle, PA, details the progress made in getting atomic information out to the Army in general and all the service schools in particular. Fort Knox instruction included Allied officers in classified atomic portions of the Company Commander’s Course. Officers from Belgium, Canada, Japan, the Netherlands, and the UK all received the 4-hour Allied officer portion of the course that dealt with atomic weapons and effects. Class rosters from 1952-1955 provided by the International Military Student Office, Dianne Atcher, Chief, 11 July 2003.


9 Army Chief of Staff J. Lawton Collins was concerned that our allies in Korea or NATO could not match the size of US divisions, based on their population and defense spending. The organization of US divisions became a concern not only for budgetary reasons, but also for interoperability reasons. Eisenhower had also voiced this concern during his tenure as SACEUR, “As you know, I have felt that the typical American division is far too expensive in personnel and, if this is even partially true, it will have most serious consequences in Europe where so many of the smaller countries are planning to organize
in the exact pattern of America’s units.” Ltr, Office of the Assistant Chief of Staff, G-3, Operations to Chief, Army Field Forces, 5 October 1951, subj.: General Eisenhower’s Memorandum of 26 September 1951 for his Chief of Staff, CARL, Fort Leavenworth.

10 Major General James M. Gavin, “The Tactical Use of the Atomic Bomb,” Army Combat Forces Journal 1, no. 4 (November 1950), 9-11. Gavin was one of the few officers who could comment on the power of the atomic bomb, this as a result of his assignment to the Weapons Systems Evaluation Group.


12 Ibid. The list of conferees included MG Taylor, BG Clyde Eddleman, who was the G3 Plans Division chief, COL Paul D. Adams from the Armored School, Fort Knox, and COL George Reinhardt from CGSC, Fort Leavenworth.

13 Ltr, HQ, 7th US Army, Office of the Commanding General to Chief of Staff, US Army, 14 February 1952, Subj.: Reduction to Present Infantry Division, CARL, Fort Leavenworth, KS.

14 Ltr, HQ, V Corps, Office of the Commanding General to Chief of Staff, US Army, 4 January 1952, subj.: Reduction in Present Infantry Division, CARL, Fort Leavenworth, KS.
15 Ltr, Office, Chief of Army Field Forces to Assistant Chief of Staff, G-3, DA, 2 May 1952, subj.: Reduction in Present Infantry Division; ltr, G-3, DA to Chief of Army Field Forces, 23 June 1952, subj.: Reduction in Present Infantry Division, both CARL, Fort Leavenworth, KS.


17 Final Report on Exercise LONG HORN, Office of the Exercise Director to Chief, Army Field Forces and Commanding General, Tactical Air Command, 18 June 1952, Chapter 1, Maneuver Director’s Report, Section 1, “Introduction,” 2, 16, USAMHI, Carlisle, PA; Moenk, 170-178.

18 MG Bruce C. Clarke and BG L. L. Doan, “The New Armored Division Organization,” Armor, 61, no. 6 (November-December 1952), 42-44; quotes from 44. Clarke later went on to command 7th Army in Europe, Continental Army Command in the U.S., and the U.S. Army in Europe.

19 HQ, 3rd US Army, “Critique of Exercise FLASH BURN, 7 May 1954” Office of the Exercise Director to Chief, Army Field Forces, 26 July 1954, Cleland comments, 9;
Gavin comments, 15-17; Dahlquist comments, 18, USAMHI, Carlisle, PA; Moenk, 196-201.


23 Gavin, War and Peace in the Space Age, 136.

24 Gavin, War and Peace in the Space Age, 136-139; Gavin, “Beyond the Stars”, 157-158.


26 Ibid, 3-6.

27 US officials in Supreme Headquarters, Allied Powers Europe (SHAPE) as well as US representatives to the NATO Military Committee were pushing the other Alliance members to accept nuclear reliance throughout the summer and fall of 1954. The NATO ministers approved Military Committee (MC) document 48, which established this

28 Watson, 247-280, addresses the Joint Chiefs perspectives on the Far East issues; see also Ridgway, 274-280; Jurika, 338-431, for Radford’s extensive discussion; Schratz, 250-254, addresses Carney’s actions. See Watson, 303-356 for the lesser issues.

Specifically, Iran’s relation with the US was tenuous as was the developing idea of a northern tier of nations to block Soviet advances in that area. The situation in Guatemala, where a Communist-supported insurgency was threatening to take control, was serious. Military aid to other Central and South American countries also consumed Army personnel. Obviously, the Joint Chiefs had significant and complex issues to address.

29 Ltr, Chief of Staff to Chief of Army Field Forces, 28 Dec 1953, subj.: “Organization of the Army During the Period FY 1960-1970,” CARL, Fort Leavenworth, KS.

30 Ibid.

31 Ltr, Chief of Army Field Forces to Commandant, CGSC and Fort Leavenworth, 15 Jan 1954, no subject, CARL, Fort Leavenworth, KS.

32 Memorandum, Plans Division to AcofS, G3, 19 November 1952, subj.: Reduction in Infantry Division, CARL, Fort Leavenworth, KS.

33 Ibid.

34 Ltr, CSA to Chief of Army Field Forces, subj.: “Organization Studies to Improve the Army Combat Potential-to-Manpower Ratio,” 19 April 1954, CARL, Fort Leavenworth, KS.
35 Ltr, CGSC, ALLEI-F, subj.: “Organization of the Army in the Field,” 28 May 1954, CARL, Fort Leavenworth, KS. The wording in the CGSC directive is “Anyone not agreeing with the guidance given can ‘make his point’ by submitting a separate paper – but only after completing his directed assignment. This is considered essential in view of the time available for the project.” See also Wilson, 264-265.

36 Study, US Army Infantry School to CGSC, 29 January 1954, subj.: “Organization of the Infantry Division,” CARL, Fort Leavenworth, KS. The AFF letter that directed the study and the February meeting is Office, Chief of AFF to CGSC, 15 January 1954, subj.: “Organization of the Army During the Period 1960-1970,” CARL, Fort Leavenworth, KS. The CGSC study that responded to the February meeting was published on 26 February as “Optimum Organization of US Army Divisions in 1960,” CARL, Fort Leavenworth, KS.


38 Wilson, 265-267; Table of Organization &Equipment (hereafter cited as TO&E) 29-5 ATFA (September 1954) Support Battalion, Infantry Division; TO&E 29-7 ATFA

39 Hugh F. Foster, Jr. “From Bars to Stars,” unpublished autobiography, Chapter 18, 8, indicates how much the Chief Signal Officer of the Army Major General George Back wanted this new organization to succeed because it meant increased prestige for the Signal Corps as well as an increase in personnel authorizations. USAMHI, Carlisle, PA.

40 Dispersion was the in-vogue solution to atomic weapons at the time. See Major Nels A. Parson, Jr., “The Impact of Guided Missiles on Ground Warfare,” Military Review, 32, no. 5 (August 1952), 16-22; Colonel George C. Reinhardt, “Notes on the Tactical Employment of Atomic Weapons,” Military Review, 32, no. 6 (September 1952), 28-37;

41 The M39 and M59 armored personnel carrier saw action in Korea and proved their value during the unheard-of daylight evacuation of Pork Chop hill in June 1953. Interestingly, that action was in 7ID’s sector; the division commander was MG Arthur Trudeau who was the Deputy Commandant of the Army War College before division command and later became the Chief of Army R&D. Trudeau was well versed in Army doctrine, acquisition, and the labyrinthine Army staff system.
Exactly why the Infantry School reversed its position is unknown. Other recommendations included the increase of vehicles for radio operators and their equipment for the infantry combat command and battalion headquarters, an increase in the S2 and S3 sections of combat command, and the request for reasoning behind the elimination of the regimental tank and mortar companies; ltr, OCAFF to Commandant, CGSC, subj.: “CORG Comments on Plan of Field Test, ATFA-1,” 31 July 1954, CARL, Fort Leavenworth, KS.

Ltr, CGSC to Chief, Army Field Forces, subj.: “Mission, Employment, and Method of Operation of ATFA-1 Divisions,” 26 August 1954, CARL, Fort Leavenworth, KS. The engineer battalion was armored in that division, while truck-mounted in the infantry division. The reconnaissance battalion was more heavily armored in the armored division than in the infantry division, where light tanks and scout cars were still used.

Ltr, CGSC to Chief, Army Field Forces, 17 September 1954, ALLEI-F, subj.: “General Concept of Organization of Nondivisional Combat Support Units, Project ATFA-1,” 1-3, CARL, Fort Leavenworth, KS. As an indication of who the threat was in 1954, the letter describes the area of operations for the field army as “theater of operations located in a temperate zone with varied terrain similar to that of Western Europe.”

Ibid, 3-9.

Ltr, OCAFF to various, ATTNG-61 350/46(14 Oct 54), subj.: “Briefing of General Ridgway, Project ATFA-1, CARL, Fort Leavenworth, KS.
Annex 1, Part III, “Objectives of the Exercise” except the last objective, which came from Appendix 2, Atomic Weapons Plan, to Annex D, Operations, to Part II of General Plan, Exercise BLUE BOLT (Fort Hood, TX: HQ, III Corps, 1955), USAMHI, Carlisle, PA. It is interesting to note that planning times for atomic weapon use in the exercise plan that Air Force-delivered atomic weapons took eight hours from notification to delivery while Army controlled systems, the 280mm gun and the Honest John rocket, took only three hours.

Letter of Instruction for Combat Command Field Exercise Phase III Exercise BLUE BOLT/AKCHO-AG 354.2 G3 (BB)/4 Feb 55, G3 to CG, 1st Armored Division, USAMHI, Carlisle, PA. Specific instructions to specific units are contained in the enclosures to the LOI.

HQ, Exercise Director, Summary and Recommendations, Volume 1, Part II, 18, USAMHI, Carlisle, PA.

Appendix E, Operations Research Office Participation, to Annex 4, Conduct of the Test, to Volume II, Part IV, Interim Report of Field Test (Combat Command Phase), General Plan, Exercise BLUE BOLT, HQ Maneuver Director, 30 March 55, 16, USAMHI, Carlisle, PA.

HQ, III Corps, Interim Report of Field Test (Combat Command Phase), General Plan, Exercise BLUE BOLT, Volume 2, Part IV, Annex 4, Appendix E, Enclosure 9, Section II, 21 March 1955, Wood comments, 1; Enclosure 10, Biddle comments, 1, USAMHI, Carlisle, PA.
52 ORO was commissioned by CONARC, AFF’s subsequent name, to prepare a study of the two exercises. The report, published in October 1956, identified the extremely short preparation for the documents and exercises plans as well as the unfamiliarity of the exercise headquarters in conducting such exercises. ORO was very critical of the assessment instruments and the impartiality of the evaluators in both cases. However, none of this reflective evaluation was available before Exercise SAGEBRUSH, the next iteration of ATFA-1 concepts. John C. Bernens, et. al., *Evaluation of Procedures Employed in Tests of the 1956 Field Army (ATFA-1)* (Chevy Chase, MD: The Johns Hopkins University, 1956).

53 Notes from LTC R. D. King, CGSC representative at OCAFF for reorganization studies, Tab E, “Guidance from MG Montague, 15 April 1954,” CARL, Fort Leavenworth, KS. MG Montague was also very well connected in the USMA circle. His 1919 classmates included these serving officers: GEN Anthony McAuliffe, USAREUR Commander, GEN Alfred Gruenther, SACEUR, and GEN Nathan Twining, CSAF.
CHAPTER 3

THE NEW DIVISION

The Army was approaching a critical stage in late 1955. The budget battles of the first two years of the Eisenhower administration had taken their toll not only on the physical structure of the Army – manpower, equipment, and operations – but also on the collective prestige of the service. The previous eighteen months of large-scale exercises were meant to develop new ideas that would allow the Army to incorporate new technologies, new efficiencies, and new methods of operations for the New Look approach to war. Yet making the change was much like turning a great ship at sea: the ideas came easily, but it took time for them to have an effect. By 1955, while the Army leadership continued to struggle with budget priority issues, it also wrestled with how best to change the Army’s war fighting units to match the new technologies, efficiencies, and methods of operations.

The year also brought a significant change at the top of the Army. General Ridgway’s two-year term as Chief of Staff ended and, in a break from precedent, was not renewed. Ridgway had presided over a difficult time for the Army, as its forces
contracted from 1.5 million men to just over 1 million and its share of the defense budget shrank significantly. He railed against the shift of national security to the policy of massive retaliation.¹ Yet he did not stand against change within the Army. He supported the introduction of atomic weapons and the development of new tactics and organizations that took advantage of them. He encouraged the innovative changes and leaders that brought about the ATFA-1 proposals. Ridgway was instrumental in starting a cultural change among the Army’s senior leaders. While many senior officers were prepared to live under the concept of ‘better is the enemy of good enough,’ Ridgway encouraged Gavin and Dahlquist, and many others more junior, to develop a vision of what the future Army might be like and ensured the promotion of innovative leaders.

Ridgway’s departure brought General Maxwell D. Taylor back to Washington to take the reins as the next Chief of Staff on 1 July 1955. Taylor was the consummate general officer. A World War II hero who commanded the 101st Airborne Division, he had steadily moved upwards through the general officer ranks by carefully championing the right causes and seeking the right supporters. As he left the Far East Command in Japan, Taylor was supremely confident that he was prepared to assume his new role as Chief of Staff. The President and Secretary Wilson had made a point of questioning Taylor’s willingness to follow their leads in defense matters, a path Taylor indicated he would follow. At least at first, he publicly supported the administration’s defense posture, but continued with the experimentation and reorganization projects ongoing within the Army. Within a few months, however, he noticed “the increasing coolness of my relations with the President,” a coolness that was, in part, due to Taylor’s decision to continue Ridgway’s efforts to create an army capable of fighting an atomic war.²
The new Chief of Staff’s willingness to follow his predecessor’s policies should not have surprised Eisenhower or Wilson. Not only had Taylor been involved with the ATFA-1 organizational studies in the early fifties while assigned to the Army G3, but he also refined some of the same concepts during his tenure as 8th U.S. Army commander in the Republic of Korea. He had directed the testing of a division organization that created more firepower in an infantry battalion than currently existed in the South Korean Army. This new organization, remarkably similar to the ATFA-1, was tested by a South Korean division in early 1954. Taylor was enthusiastic about the new organization, but was unable to convince Korean military leaders to adopt it. Now, as Army chief, he had the opportunity to implement his views on the U.S. Army.3

Taylor first had to learn that service in the charged political atmosphere of the Joint Chiefs of Staff was different than his prior experience in the Pentagon and remarkably different than his experience in the Far East. While service in Washington was not new to him, he was now the sole source of Army views among the Joint Chiefs. The interservice rivalry was certainly more palpable than when he served as the Army’s Deputy Chief of Staff for Operations in 1951. Then it had been focused on meeting the Korean War needs, now Taylor found he had to fight daily for enough troops and money to accomplish the Army’s assigned missions.4

Taylor believed that his primary mission as Chief of Staff was to address the national strategic issues with the White House, DoD, and Congress.5 His initial focus was certainly at the strategic level, but he remained involved with the training issues of the day as well. As part of his in-briefings as the new Chief of Staff, Taylor certainly heard several presentations on the ATFA-1 exercises, after action reports, and the plan
for progress to SAGEBRUSH. Though not specifically meddling with the plan, he assuredly watched its progress.

Taylor was also curious about a project the Army War College finished in January 1955 and was now circulating in Washington. The War College, as had the Command and General Staff College, had been sent several directives to assess the Army of the future. Ridgway asked for such a study in December 1953, as did AFF in October 1954. In response, the Advanced Study Group at the War College developed Project Binnacle, a blueprint for the organizational structure of the army for 1960-1970. Binnacle was predicated on the assumption that the Soviet Union and the United States/NATO would fight a major ground war for the control of Western Europe in which hundreds of nuclear weapons would be used and hundreds of thousands casualties would be inflicted, many of them from the effects of initial radiation and residual fall-out from the bombs.

Among Binnacle’s most significant conclusions was that as currently organized, the Army primary combat formations – its divisions and regiments – were too inflexible and cumbersome to respond to an enemy atomic strike or to take advantage of a friendly strike. A smaller and more maneuverable tactical organization was necessary. As a result, one of the recommendations was to create: “divisions composed of small self-contained combat teams, approximating 1000-1300 in strength, completely air transportable, containing organic air lift and true cross-country vehicles, heavily armed with automatic and nuclear weapons, and geared to employ nuclear weapons to the maximum for both long-range and close-in combat . . ..” The new organization could be transported and supplied by forty “compound” aircraft, capable of acting as both a plane
and a helicopter. Mobile, maneuverable, flexible, and heavily armed, the proposed organization could both fight and survive “in two-sided tactical nuclear warfare.”

Binnacle also recommended scrapping the Army’s ground-based lines of communication (LOC) in favor of aerial LOCs. Perhaps influenced by the swift advances of technology in other fields, the report made the remarkable prediction that by 1965 off-shore bases would serve as the European Rear Area and those bases would be supplied from the United States in a combination of sea (70%) and air (30%) resupply. All of the supplies leaving the off-shore bases to the front lines would be by air; no ground LOCs would exist in theater besides a minor fuel base. Instead of being tethered to large supply dumps and fixed road systems – both of which provided easy targets for enemy strikes – the new formations would be able to operate freely, even behind enemy lines. These recommendations were based on the predictions of Soviet missile advances and the necessity to avoid establishing a lucrative logistical target whose elimination would thwart any operational advance.

The impact on Army combat forces discussed in the report was significant, the emphasis on technology, remarkable. With the number of armored vehicles and aircraft in the recommended combat teams, fuel requirements were very high. The report estimates that each combat team would require over three hundred thousand gallons of fuel daily to sustain itself in combat. Because the unit was self-contained, all types of supply would have to be flown forward to each unit. Since each combat team was organized similarly, cross-leveling supplies within the division would have been easier. But because no wheeled supply vehicles were in the division, only aircraft would deliver supplies. The readiness rate of the aircraft, a constant problem for every army in World
War II, would have to be very high. Sustaining this kind of maintenance level, let alone
the aerial bridge necessary for division resupply, would have been next to impossible.\footnote{8}
The reliance on the future, while not entirely unwarranted, was carried almost to the
extreme by the War College report.

Binnacle’s gloomy predictions of 35% casualties monthly in a two million-man
force as a result of atomic war in Europe provided sober commentary on the policy of
massive retaliation.\footnote{9} However, the organizational conclusions were the most applicable
part for the mid-fifties. Though the project report went to Army Field Forces
headquarters in January 1955, the report also circulated through the Army schools and the
Pentagon. Senior leaders continued to wrestle with the idea of how to restructure the
Army on the basis of a nuclear war with the Soviets, while maintaining the budget and
manpower ceiling imposed by the Department of Defense. The continued answer was
dispersion, mobility, and effective communications, with continued, and increasing,
emphasis on the promise of technology.

In the middle of 1955, as the Army continued to concern itself with the proper
organization for combat, Europe was still the primary theater. But the ability to respond
to Soviet incursions anywhere in the world was also important. That called for units that
were self-contained and small enough to deploy quickly or, in the vernacular, “light
enough to get there, heavy enough to stay.” The focus of any reorganization effort, either
at Fort Leavenworth’s CGSC or Headquarters, Army Field Forces (now named
Continental Army Command [CONARC]) at Fort Monroe, had to involve a smaller,
more capable force that was easily deployable to any point threatened by the Soviets or
their surrogates. Thus the ATFA-1 study, still based on the World War II-type division,
began to fade in importance as other studies, such as Binnacle, grew. ATFA-1’s conclusions went in the wrong direction, recommending larger organizations with more equipment and soldiers. CGSC, CONARC, and the Army G3 office continued to wrestle with the requirements for a small, mobile, yet lethal army structure that could fight both atomic and non-atomic battles. All of the offices involved still had the national security direction provided by NSC 162/2 as the basis for their organization, but even that shifted as Eisenhower began his third year in office.

On 7 January 1955, Eisenhower approved NSC 5501, the latest revision of National Security Policy. Although the basic tenets of NSC 162/2 were still applicable, including the maintenance of nuclear retaliation as the basis for military preparation, NSC 5501 also called for military forces to “be properly balanced, sufficiently versatile, suitably deployed, highly mobile, and equipped as appropriate with atomic capability” to “punish swiftly and severely any . . . local aggression, in a manner and on a scale best calculated to avoid the hostilities broadening into total nuclear war.” Though General Ridgway argued successfully for this type of wording in the policy memorandum, it was up to Taylor to take it further. NSC 5501 fit exactly into his line of thinking and gave Taylor the opportunity to capitalize on the AFF/CONARC and CGSC reorganization proposals. Thus the ATFA-1 proposals and the emerging thoughts from Project Binnacle and Montague’s group at CONARC headquarters represented two different paths to accomplish the objectives of NSC 5501. The ATFA-1 proposals represented an evolution from the regimentally based triangular division to combat command-based division. Montague’s work was more radical and will be examined later. But both organizational changes would result in Army units that were “sufficiently versatile,
suitably deploy[able], and highly mobile,” to meet the intent of the NSC memo. The crux of the issue became which organizational path was the best one to follow.

Through the summer of 1955, Dahlquist at CONARC monitored Montague’s work, but turned over the ATFA-1 revisions to CGSC. After the evaluations of FOLLOW ME and BLUE BOLT, the CGSC study group recommended several changes to the organization of the infantry and armored divisions. The changes were intended to make units more self-contained and thus deployable. In both divisions, the combat command headquarters was organized more efficiently to control the subordinate battalions with the administrative and logistical functions moved up to the division level. The “leg” infantry battalions added more machine guns and 81mm mortars. The tank and armored infantry battalions became more self-sufficient when a maintenance headquarters section joined the battalion’s headquarters company; it augmented the already existing maintenance platoon. More significantly, the infantry division support battalion was restructured and became identical to the armor division support command. It was slightly smaller for SAGEBRUSH than FOLLOW ME because of the reassignment of personnel functions, but its truck and maintenance capabilities increased. The growth from the support battalion to the support command also put that commander on equal footing with the combat command commanders. The armored division support command also decreased in the personnel services area and increased in the maintenance battalion; the truck hauling capability decreased. The respective signal battalions shrunk in numbers and transport, but increased in radio capability as radio relays and repeaters were added to the battalions. Altogether, the two divisions closely resembled each other.
from an organizational perspective as the revised Tables of Organization and Equipment were published for Exercise SAGEBRUSH.\textsuperscript{13}

These changes were implemented and tested in November and December 1955, using the same two divisions, 3\textsuperscript{rd} Infantry and 1\textsuperscript{st} Armored, as the two previous exercises. This exercise, for the two divisions at least, essentially became ATFA-2 as they used the modified TO&Es to test the concepts of offense, defense, supply, and maintenance internal to the divisions. However, the tests on the new divisions would be supplementary to the SAGEBRUSH test objectives, which were focused on the logistical structure of the field army.\textsuperscript{14} With this higher echelon focus, the exercise “. . .was to determine the adequacy of the ATFA-1 Field Army doctrine, organizations, and concepts to meet the conditions of decentralization, dispersion, and alternate means imposed by atomic warfare.” The exercise was specifically designed to test the “reorganization of service support units . . .since they constituted a radical departure from the organizational concepts then in use.” This consideration resulted from the obvious fact that the Army had not tested, in any kind of large-scale exercise, the service support concepts in any echelon above division. The fear existed that “. . .the United States [would fight] a future war with a logistical system that had not been thoroughly tested to determine its capability for furnishing the required support in an atomic conflict.”\textsuperscript{15}

Thus Exercise SAGEBRUSH had multiple objectives at multiple levels that proved more complex to assess than first imagined by the Army maneuver commander, Lieutenant General John H. Collier, the new 4\textsuperscript{th} U.S. Army commander. While subordinates supervised the division tests, Collier and his staff focused on the CGSC-designed Field Army Support Command (FASC), a new concept. An exercise goal was
to determine if the field army could operate under both atomic and conventional conditions against an enemy that used atomic weapons. When the atomic bomb created special conditions on the battlefield, could the redesigned division capitalize on those conditions and perform its mission better, faster, and more effectively? Could depths and frontages for the field army units be expanded to allow the necessary dispersion while permitting concentration in time for effective defensive and offensive operations? The requirement existed for field army combat units to occupy larger areas of operation, but could the logistical system support the dispersed units effectively? The FASC concept built on the successes of FOLLOW ME and BLUE BOLT and was designed to answer these fundamental questions for SAGEBRUSH.16

An important element of the exercise was to evaluate how the logistical support system – from combat command through division and corps to field army – operated. The ATFA-1 design streamlined the support functions at the lower levels and pulled those functions up to higher levels. In established organization and doctrine, the Theater Army Support Command, at the top of the supply pyramid in a theater, provided all the logistical and administrative support to subordinate corps, essentially bypassing the army level. Under the ATFA proposals, the field army received the CGSC-designed command to coordinate all of the support requirements for its subordinate units. This was necessitated by the expansion of the battle area due to atomic weapons. The FASC then provided support to Corps Support Command, which, in turn, supplied the Division Support Command. This new concept required the FASC to place itself as a new layer of bureaucracy where none had existed before, a formidable task. Yet this magnitude of supply dispersal was seen as essential under atomic conditions. Not only did the supply
bases have to be smaller and more scattered, but in order to achieve the flexibility and
deployability in the combat commands and divisions, the administrative and support
functions had to be consolidated higher. The FASC represented the first attempt in this area; it would not be the last.

According to the evaluators, Exercise SAGEBRUSH was a success. The 3rd Infantry and 1st Armored Divisions performed admirably under their new TO&Es. Their defensive operations successfully held the Aggressor forces in position so atomic weapons could be used to decide the issue. In the offensive portion of the exercise, both divisions successfully employed their combat commands against the aggressor defense, though significant use of atomic weapons also aided in these attacks. The division after actions reviews indicated that almost all the concepts used were appropriate and effective for atomic warfare. Fort Leavenworth’s adjustments to ATFA-1 had resulted in more effectively organized infantry and armored divisions, with distinct combat command headquarters and more combat units added, raising the strength of each division by over two thousand soldiers. The emphasis on tactical dispersion between units was appropriate, though most often ignored by player units for practical reasons. The new communications networks were well practiced by the time the exercise was over; the signal units performed admirably. The evaluators concluded: “The basic concept of the Army Grid Communications System at the field army level is sound and constitutes a major improvement over the current system.”17 The logistical methods designed by CGSC for the exercise – the main purpose of it, in fact – did not fare as well. The Field Army Support Command concept ended quickly and quietly after the exercise because it
did not provide the efficient logistical support expected and simply concentrated too many functions at too high a level.\(^{18}\)

The final exercise reports were published in February 1956 and had little impact on the Army as a whole. Division structures continued to be tweaked by the service schools as Fort Leavenworth’s ad hoc committee continued work to resolve the ATFA-1 issues of how to logistically support the field army while retaining the lower echelon flexibilities and effectiveness. Perhaps the most significant observations on the field army system and the exercise itself came from George Washington University’s Human Resources Research Office (HumRRO). Their appraisal was very critical of the Army’s less-than-analytical approach to the exercise and did not endorse the results. From the HumRRO perspective, SAGEBRUSH did not confirm the value of any new organization over the old, did not endorse the FASC organization, and did not validate the effectiveness of the testing procedures. It confirmed that there was poor prior planning, that time was not available to properly create evaluation criteria, and the evaluator training was ineffective and biased against the new organizations. Coming from a civilian agency contracted by the Department of the Army, this report was stinging in its indictment of the scientific ineffectiveness of the exercise.\(^{19}\)

Apparently, the Army was only slightly better off after the extensive maneuver exercises of the previous eighteen months. FOLLOW ME, BLUE BOLT, and SAGEBRUSH all tested some aspect of division reorganization, but the infantry community, and armor community to a lesser extent, was still dissatisfied with the results. The infantry division, with its combat commands, had more infantrymen under the June 1955 SAGEBRUSH/ATFA-2 TO&E than under the previous tables, but still
lacked adequate transportation and combat support to make it a self-contained unit.

Division firepower for the close-in fight had increased at the battalion level with more machine guns and bigger mortars, but the mid-range fight was more tenuous because the number of pieces in the division-level artillery decreased. The antiaircraft function was now dispersed among the artillery units and control was diluted to several different artillery battalion commanders vice one anti-aircraft artillery battalion commander.

Perhaps the greatest insult was the loss of prestige associated with the regimental system. The combat command headquarters just did not evoke the same emotional attachment and unit esprit as the long-serving infantry regiments. The culture change associated with the new combat command would be slow to take root in the infantry circles.

On the opposite end of the organizational spectrum, the armored division did not lose much capability in any of the reorganizations and added in the service support areas with a more streamlined support command structure. The combat command concept was readily understood and accepted by armor officers and any other soldier who had served in armored divisions. Once trained in the flexibility of combat command, many officers could not understand why a unit would operate in any other way.

As the Army branches wrestled with the organizational dilemmas, another alternative to division organization emerged. At the same time that the Command and General Staff College was working on creating and updating the ATFA-1 studies, the Continental Army Command was also working on its version of a reorganized army under the auspices of Major General Robert Montague, Deputy Commander of CONARC. Its product, “Doctrinal and Organizational Concepts for Atomic-Nonatomic Army During the Period 1960-1970 [Pentana Study],” was published at the same time.
that Exercise SAGEBRUSH ended in December 1955. It circulated among the Army’s senior leaders about the same time as the interim and final exercise reports from SAGEBRUSH were circulating. The study built on the previous work done by the contracted research offices at Johns Hopkins University and RAND and the Army War College Project Binnacle study to raise the structure and organization debate to a much higher level.

The Pentana Study was very different than the ATFA-1 studies. While the ATFA division organizations retained the triangular organization of World War II, the Pentana division adopted a radical new pentagonal organization of five combat units within the division. More significantly, the study very openly indicated that the new design was based on nuclear use. Everything within the new concept specified that nuclear weapons, nuclear use, and nuclear war were part and parcel of the conduct of operations for the period 1960-1970. Rather than adopting the existing organization to atomic warfare, as the ATFA studies had done, the Pentana Study assumed atomic warfare and created units to operate under those conditions. The new study appeared in December 1955 and had a greater impact on the Army than the early ATFA studies or the SAGEBRUSH results. Its appearance was much like the coming of spring, new ideas that showed a promise of revitalizing the Army when the ATFA studies and exercises could not.

The Pentana Study addressed several “facts bearing on the problem” that were believed to be relevant for the development of the organizations laid out in the study. The first fact set the stage for the rest: “The objective of the Department of the Army 1960 and 1965 war plans is to provide a means of carrying the war to the enemy at the earliest possible date by designing forces which can overcome the natural geographic
barriers which surround the Soviet Bloc and today constitute major deterrents to
offensive operations.”22 In other words, the “facts” outlined for the Pentana Study were
based on the need for early offensive action carried into the Soviet homeland, a need not
identified during the ATFA-1 studies.

Another fact thought relevant to the problem of Army organization in 1955 was
the decision to accept the need for a unit “which will contain the maximum of strategic
and tactical mobility, vastly improved flexibility, and killing power; which will be
capable of operating with battalion-sized, combined arms battle groups and which will be
capable of executing large-scale, long-range amphibious and airborne operations without
requirement for ground link-up.”23 Based on these facts, the Pentana Study developed a
tactical organization very different from that of ATFA-1: a self-sufficient combat group,
containing “components which provide for the occupation of the ground; for control
facilities; for anti-tank, anti-personnel, and anti-materiel firepower and for maintenance,
supply, and messing.” This self-sufficient unit was estimated at 1,000 soldiers for the
early part of the subject decade and “a considerably reduced size in the latter part.” The
combat group would have its own tactical nuclear weapons and other, larger nuclear
weapons would be available to it. Even if nuclear weapons were not used, the projected
estimates for conventional munitions – called optimum fragmentation projectiles –
indicated their ability to create a similar effect. Chemical and biological weapons should
also be counted on.24

The Pentana Study also designed a logistical system to supply the restructured
division, corps, and field army with enough supplies to perform on the atomic battlefield.
It would have very small infrastructure and would depend on “dispersed airfields, minor
ports, and over-the-beach unloading operations in contradistinction to World War II type major port operations.” The emphasis was on unit delivery of supplies directly from the theater army when possible.25 To further reduce the logistical challenges, a common chassis for track and wheeled vehicles was predicted as were common weaponry for all echelons of the organizations.

The conclusions and recommendations of the Pentana Study listed several key technological advances that were also required for this concept to work. An assault aircraft, “capable of short-run landing and take-off from unprepared ground areas and lakes or rivers,” was necessary. A replacement for the tank – weighing between 8-10 tons – was necessary. The optimum fragmentation projectile and “smaller and more efficient nuclear projectiles and warheads” were important for the direct and indirect fights. Communications equipment had to be resistant to jamming and other electronic countermeasures.26

Other significant changes required an Army-run transport aircraft fleet. This at least was reported as currently impossible until Army and Air Force agreements were revised or rescinded to allow the Army to “develop, organize and procure the aircraft, operating and maintenance personnel, and equipment required by” the proposal. The integration of combat arms at the battalion level was recommended, as was the pentagonal nature of all the units within a theater army. Not only were the battle groups designed around five companies, but the division, corps, and field army were all arrayed with five subordinate echelons.27

The five-unit organization concept had been circulating within the senior Army leadership for a number of years already. As a proposal for reorganization, the Army G3
staff recommended a five-unit division in 1952. Major General Robert M. Montague addressed a five-unit organization in April 1954. The Pentana Study capitalized on these ideas and created a division that met the Chief of Staff’s request for a smaller, more lethal and harder-hitting unit than the present division, ATFA-1 included. The pentagonal division and the battle group were born.

The advent of the new organization created a situation within the Army hierarchy of managing several different versions of unit TO&Es. The experimental army, essentially the 3rd Infantry and the 1st Armored Divisions, were organized with the experimental ATFA-2 TO&Es, though both units had the requirement to return to the standard TO&E within ninety days if required. The Army’s other divisions lived with the standard, approved TO&Es; they did not move any equipment or make any organizational changes based on the field exercise results. Thus the Pentana organizations were compared to the existing organizational tables, those that the “real” army lived by, and not the experimental tables of ATFA-2 designed for SAGEBRUSH. As ATFA-1 evolved into ATFA-2 for SAGEBRUSH, the results of that exercise should have generated an ATFA-3, but instead the decision was made to follow the Pentana organizational route and the ATFA studies were shelved.

The Pentana division battle group was envisioned as an amalgamation of two echelons of command: the battalion and the regiment/combat command. It was meant to be larger than the former, yet smaller than the latter, with a smaller division overall. Comparisons, based on the approved infantry division numbers and the pentagonal organizations, showed the five-unit model as more capable, with more firepower and less personnel. The current infantry division had over 13,000 soldiers assigned; the Pentana
division had less than 8700. The three infantry regiments within the division each had 3,600 soldiers assigned; the five battle groups each had almost 1,300 assigned. The smaller numbers in the pentagonal forces meant that their military effectiveness hinged on the benefits of firepower, and especially nuclear firepower.\textsuperscript{28}

The Pentana division and battle group grew out of the desire to make smaller yet more capable organizations that were survivable on the atomic battlefield. While CONARC supervised all of the ATFA studies and exercises, its own study group used different facts and assumptions to design the new organization. The study group benefited from the ATFA proposals, maneuver exercise results, and Project Binnacle by integrating three concepts: the small, hard-hitting, and powerful battle group, consolidation of common and routine supply and administration tasks at division and corps level support command, and corps and field army restructuring was required to make division restructuring effective. All three concepts had to be adopted in unison for any one of them to work as predicted.

The battle group was designed around the sized-unit indicated by Project Binnacle. The War College had recommended a unit between one thousand and thirteen hundred; the Pentana Study placed the battle group at 1,279. It had four infantry companies, an artillery battery, and a headquarters and service company. Each of the infantry companies had four rifle platoons; each platoon had three ten-man squads and a machine gun squad. The company also contained a weapons platoon equipped with 81mm mortars and two 106mm recoilless rifles. The artillery battery had an anti-tank platoon, equipped with a new anti-tank missile, and a new weapon dubbed the “moritzer”, which “combined the best characteristics of the mortar and the howitzer.”\textsuperscript{29}
The key difference between this Pentana battle group and the ATFA combat command was perhaps the most essential element of the Pentana Study. The entire battle group would ride to battle, mounted in a “lightly-armored, amphibious, cross-country vehicle,” designed around a single chassis, modified for each of the different uses of the battle group organizations. Under ATFA, infantry units could remain dispersed to avoid atomic blasts, but they could neither move rapidly enough to gain advantage from friendly blasts nor concentrate sufficient mass to break through enemy resistance. The only way for the Army to take advantage of atomic weapons was to provide the infantry with some form of shielded transport that could move rapidly cross country and carry sufficient firepower to smash through enemy defenses. A mechanized Army was the method to do this and was the means to accomplish the goals envisioned by Project Binnacle, the Pentana Study, and the CONARC leadership and planners.

The battle group differed in other ways from the combat command. A fourth company allowed the battle group commander to “fight square” and preserve tactical freedom by always having at least one uncommitted company to act as a reserve. The weapons company’s heavy machineguns and mortars were distributed to the rifle companies and the weapons company itself was replaced with an artillery battery. The battery’s eight “moritzers” were supposed to replace the division artillery’s 105mm howitzer batteries. This placed artillery support in the battle group – a radical idea in itself – eliminating the division artillery echelon from the tactical level of fire support. Lastly, the anti-tank section, mounted in their “lightly-armored” vehicles, would replace the light or medium tanks that had usually been attached to the infantry battalion.
The operations of the battle group also differed from the operations of a combat command. The two types of ATFA divisions, infantry and armored, each operated according to the base unit: the “leg” infantry battalion or tank battalion. The remaining divisional units were added to the division base to provide support to the infantry or armor battalions. In the Pentana divisions, every battle group was an integrated, mechanized combined arms team, “producing a unit that is no longer infantry, armored infantry, cavalry, or armor, per se, but a killer force that is compatible with the technological advances and needs of the immediate future.” Thus the battle group could move or maneuver unlike any infantry battalion could. Because their vehicle was also intended to be a fighting vehicle, the battle group’s infantryman had an advantage over the armored infantryman who could not fight from his vehicle, but had to dismount to employ his weapons. Enemy tanks were countered with the mobile, protected anti-tank fires delivered by the battle group’s organic sections, thus obviating the need for the infantry regiment’s tank company. Artillery support for the battle group was organic with the moritzers and organic to the infantry companies with the 81mm mortar. Thus defensive sectors could be somewhat larger than a standard or ATFA reinforced infantry battalions’ while the attack zone could be kept the same, yet have more concentrated firepower in it.

The Pentana division was to operate very differently than the ATFA division or the standard infantry division. The combat commands of the ATFA division or the regiments of the standard divisions generally had triangular maneuver elements: three battalions and three companies for each battalion, resulting in twenty-seven companies for the division commander to plan for. The Pentana division commander would have
only twenty companies to move, four each in the five battle groups, but they were each more powerful than the twenty-seven companies for the reasons described above. The Pentana division commander would be able to affect the tactical battle with his divisional artillery, equipped with a yet un-designed indirect fire artillery weapon and with nuclear tipped missiles; other division commanders could not do so.33

Tanks would be completely removed from the Pentana division and consolidated at corps level into tank brigades to be parcelled out based on the battlefield needs. The Pentana divisions, all armored and equipped with mobile anti-tank weapon systems, would not need the addition of tank units to perform its missions. Furthermore, the tank would not fit into the battle group or division design. Configured to be air-transported immediately to Europe and then to use air-mobility for movement and supply, the Pentana division’s equipment had to be transportable on the C-123 and C-130 aircraft. The Army’s existing and proposed tanks were too heavy for this. So the CONARC planners removed them from the battle groups and designed corps operations to bring tanks into the area of operations by sea or rail at some future point.

The self-supporting nature of the pentomic division logistical structure, closely tied to the corps and field army logistical structure, gave the new organization a distinct advantage over its predecessors. Described as the “difference between irrigation by inundation and selective irrigation by pipeline and hose,” the new structure depended on a scheduled supply network, “an airline of communications, and high speed electronic data processing machines.”34 In other words, Pentana’s logistical system was as Project Binnacle forecasted, aerial resupply to the corps and division would be the norm. From division to battle group, supplies would be on a “push” basis, meaning items would arrive
on a schedule, rather than a “pull” basis, items arriving only after they were requested. The division resupply would be constant, predictable, and predetermined. It was also to move forward to the battle groups in armored resupply vehicles, unaffected by battlefield conditions.

The CONARC Pentana Study described in great detail how all of the formations, from company through division to corps and field army, were designed to operate. The one caveat that was paramount, however, was noted by both Ridgway and Taylor as they each reviewed the guidance for the Pentana Study: the new concepts were “dependent upon considerable technological advances which may or may not occur.”

As the Pentana Study circulated across the Army, many of the comments CONARC received from the service schools suggested this reliance on technological developments was too great and the pentagonal organization could not succeed.

The Army War College viewed the Pentana Study with appreciation: “The concept of battalion size, self-contained, combined arms, highly mobile battle groups organized in a single type division is fully endorsed.” But the War College cautioned that the creation and maintenance of an air arm for the Army would duplicate the Air Force’s strategic deployment and intra-theater airlift responsibilities. A thorough reexamination of Air Force, Army, and the air arm of the Navy roles and missions might resolve this, but it would be a very contentious process that might take years. The College also believed that the weight of recommended missile equipment was excessive; more efficient and lighter weapons had to be developed; and the logistical organization from theater through field army to corps and division needed more detailed requirements for each echelon than was described. Finally, the AWC recommended that the Pentana
Study’s projection into the latter part of the decade were more acceptable than early decade projections; CONARC should adopt the latter projections now and discard the early projections entirely. It “urge[d] that no effort be spared to bring about the earliest adoption by the Department of the Army of an approved concept for the future Army . . . as a common goal toward which all appropriate elements of our defense effort will be directed.”

The reviewers at CGSC were far more critical, arguing that the Pentana Study relied “too greatly upon generalities, somewhat vague application of principles, [and] the assumption that what is desirable is obtainable . . .” CGSC claimed that the atomic war scenarios were too vague and provided insufficient guidance for planners and commanders on how to use the division in atomic combat. Moreover, even if atomic weapons were not used, the study failed to consider the implications of the significant increase in the logistical tail created by the complete mechanization of the corps and below units. The reviewers also questioned whether it was possible for the Army to build an air fleet of transporters, maintain an air LOC in the face of a determined and well-equipped enemy, and create an aerial resupply bridge capable of supplying corps and divisions during conflict. Perhaps the greatest unanswered question from the reviewers was a situation in which US forces occupied an area, dispersed in preparation for atomic war, and the enemy launched a concentrated “conventional” World War II-style attack without using atomic weapons. Would the US be willing to be the first one to use atomic weapons in order to prevent the complete destruction of its force and an allied force—and risk the danger of the war escalating into a strategic nuclear exchange? The
CGSC critique thus raised a very critical issue: was the proposed division capable of fighting without its atomic weapons?

Leavenworth’s criticism of the Pentana Study was well directed and raised questions that should have alerted the Army senior leadership. But it revealed another issue that would prove increasingly significant in the organizational experiments: that the Army institutions charged with reform had still not achieved consensus. Part of this can be attributed to the differing directives on organization and doctrine they had been issued. Part of it was the weight each accorded to past experiences such as Korean combat or Exercises LONG HORN and SAGEBRUSH, to the possible impact of new technology, and to their vision of future war. But part of this appears to be institutional parochialism. In this respect, CGSC’s objections to Pentana – and the War College’s endorsement – may reflect a parochial attitude towards its own design. This tendency, as will be shown, was not confined to Leavenworth. Whatever the cause, this attitude indicated a level of disagreement and criticism that would follow the organizational studies into the future.

The service schools also responded to CONARC with criticisms of the Pentana Study. The Infantry School still did not want to lose the regiment, but acceded to a modified version of the battle group that was a regiment in every way except name. Rather than the Pentana battle group, the Infantry School recommended a larger, more robust battle group with nearly seventeen hundred soldiers. It had five companies, each with three platoons and a weapons platoon, an artillery battery containing two additional, totaling ten, moritzers and no anti-tank section, and a headquarters company that included both a reconnaissance and engineer platoon. Other recommendations included the consolidation of the anti-tank assets at division level to allow for allocation where
necessary on the battlefield, additional fixed wing and helicopter assets for the division aviation company, and the addition of three combat command headquarters. The recommended division totaled over 15,400 soldiers, almost doubling the 8,700 in the pentagonal division. In general, the Infantry School accepted the mechanization concept from the Pentana Study and recommended the highest priority for the moritzer’s development. \(^{41}\) Damning the pentagonal proposal with faint praise, the Infantry School reviewers essentially recommended a return to the ATFA organization that 3rd Infantry had used during Exercise SAGEBRUSH. The concepts of the Pentana Study were good and should be examined further, but the proposed organization was too lean for the Infantry School’s liking.

The Armored Center at Fort Knox was more parochial in its objections to the Pentana Study. Emphasizing that “change for the sake of a change must be avoided,” the Armored Center reviewers referred to Exercise SAGEBRUSH and its ongoing tests as the appropriate method of incremental – rather than radical – change. \(^{42}\) Its first major objection was the complete elimination of armored divisions: concentrating tanks in corps-level brigades was a complete rejection of the hard-won experience of World War II. To the Armor Center evaluators, no mechanized division, no matter how well equipped with anti-tank devices, would be able to stand against the hundreds (if not thousands) of tanks and mechanized guns that the Warsaw Pact would use in an attack. Furthermore, the armored carrier of the pentomic division was not even a true fighting vehicle; infantrymen would still have to dismount the vehicle to take and hold ground. The tank, on the other hand, was an armored fighting vehicle, capable of movement anywhere on the battlefield and countering the massive numbers of Soviet forces in
Europe. Perhaps not surprisingly, the Armored Center’s harshest criticism was levied against the proposed weapon that threatened its entire existence – the DART anti-tank missile. Although perhaps done from the wrong motives, the objections to the DART were quite accurate. Handled by a dismounted infantryman or launched from a specially equipped vehicle, the DART was too vulnerable against a trained and ready enemy. The weapon was too slow, had no protection itself, and had to be wire-guided to the target. Certainly it could not replace the tank, with its armor and rapid-fire main gun, machine guns, and high-power sighting systems.

The Armored Center also criticized what it viewed as a misplaced reliance on the optimum fragmentation ammunition and the air lines of communication. The former promised better ammunition for the tank cannon, thus making the tank more effective than it was at present. This was obviously a benefit to the armored division, the reviewer reasoned, but availability of the ammunition was questionable. The air LOCs created a greater vulnerability to the pentagonal division since airfields presented an atomic target that could neither be dispersed nor well hidden, given the number of planes that would have to arrive and depart to keep a division supplied. Based on considerable experience in mechanized operations, the Fort Knox reviewers predicted that a mechanized division, even on the Pentana scale, could not be supplied or maintained through an air LOC. In summary, the Armored School did not recommend that the Pentana Study continue, even on a conceptual basis. It was “based on an overly optimistic evaluation of the capabilities of new and untried weapons and illogical concepts of operations and logistics.” A return to the ATFA studies was encouraged.
The Artillery and Guided Missile School, Fort Sill, Oklahoma, also reviewed the Pentana Study and did not accept the artillery concepts outlined therein. The artillery perspective pointed out the inadequacy of artillery tubes to carry out the primary missions of direct artillery support and counter-battery fires. While the battle group had an organic moritzer battery, the division had a general support battalion of a yet undeveloped type. For the division to succeed, two new types of artillery weapons had to be developed, an unlikely proposition. Furthermore, the concepts of fires and maneuver placed the corps artillery too far to the rear of division boundaries to have an impact on the counter-battery fight, the corps’s primary indirect fire mission. Given the known capabilities of the Soviet and Warsaw Pact armies, the counter-battery fight battle was an essential element of success for US forces. The Artillery and Guided Missile School reviewers also noted that the Pentana Study relied heavily on another undeveloped item, rocket launchers with conventional warheads of optimum fragmentation type to justify a reduction in the tube artillery. But to the reviewers, this reduction came at the cost of a commensurate reduction in flexibility to respond to Soviet artillery fires, making the U.S. forces more vulnerable to enemy fire unless they used atomic weapons.47

Perhaps the Pentana Study’s harshest criticism came from the Chief of Engineers and the Engineer School at Fort Belvoir, VA: “the basic study . . . does not accurately portray and evaluate the many contingencies and assumptions upon which the study depends. The appendices, particularly, are persuasive attempts to present preconceived solutions rather than objective efforts to arrive at logical solutions of optimum benefit to the Army.”48 As with the Armored Center, the Engineer School reviewers were primarily concerned about the elimination of their own units. They argued that regardless of the
projected capability of the new armored vehicles, not every piece of ground was trafficable, every river fordable or swimable, or every road useable. Thus engineers were still required for the traditional engineer missions. All of the defensive descriptions of the Pentana Study focused on dispersion and atomic weapons; no mention of defensive works appeared. The Engineer School rightly predicted that the battle group required assistance in creating their defensive positions and, again, engineers were required to perform those missions.49

The reviewers made a number of other objections to the removal of engineer units from the division. The Pentana Study neither addressed the issue of the engineer’s traditional duties of terrain evaluation nor included any topographic section within the division headquarters. It did not address who would take over the engineering duties of establishing the division, corps, and field army water supply. It claimed the Pentana division’s bridging unit was inadequately equipped. Finally, it noted that the Pentana Study requirement to air-lift units and unit supplies into an area of operations was predicated on an existing airfield, but that no engineer units were designated to build these airfields. Engineer camouflage units, vital to hiding equipment and thus denying an enemy vital information, were eliminated. Indeed, the litany of pitfalls, omissions, and unfounded judgments identified by the engineer reviewers indicate how seriously flawed the Pentana Study appeared to the serving Army.50

The most damning comments came from Lieutenant General Samuel D. Sturgis, Chief of Engineers. His personal, seven-page letter to General Dahlquist, Commander of Continental Army Command, articulates many of the same concerns that the Engineer
School identified, yet states them far more bluntly. The opening paragraph to Dahlquist clearly stated Sturgis’s concern:

I find the concept completely unacceptable intellectually and scientifically. Rather than a hypothesis tentatively verified by controlled experiment and careful inductive reasoning, the Pentana Army appears to be a goal to which certain highly artificial arguments have been added. It is almost impossible to escape the conclusion that the mechanized, air-transported Army created in this concept was the objective, not the rigorous consequence, of the evaluation of facts. If accepted as doctrine, this concept would impose a straight-jacket on the Army for years to come.51

Sturgis went on to explain the lack of engineers would be a fatal omission, given the significant role engineers had played in World War II and Korea. A mechanized force would never offset their loss as experts in construction, destruction, fortification, and terrain analysis.

Sturgis also identified the most difficult part of the Pentana Study – air-transportability – as the most objectionable inside and outside the Army:

I consider this concept unacceptable to the other services, to the Joint Chiefs of Staff, and to the public. I do not believe that the Air Force can be induced to abdicate their interests in the fields of air transport and tactical air to the degree required by the concept. Nor do I think that the JCS can be induced by this concept to realign, by assigning to the Army funds and responsibilities now belonging to the other services, the equilibrium of power that currently exists.52

Sturgis concluded his letter with the admission that he was “in no sense a defeatist” but wanted Dahlquist to understand the depths of his concerns. Sturgis hoped that CONARC could design “a realistic transition Army . . . which is closely related to proven tactical, logistical, and mechanical facts-of-life.”53 The Chief of Engineers was neither alone in his commentary nor his objections. By early 1956, other senior officers were expressing their concerns.
In personal letters between Major General Max Johnson, Commandant of the Army War College, and Major General Garrison Davidson, Commandant of the Command and General Staff College, a pattern of concern and camaraderie emerges that foreshadows the Pentana Study’s demise. Johnson argued that the logic behind the pentagonal organization was faulty: “On the one hand, the Army says the use of nucs [sic] is unlikely, or that, if used, they will be used only tactically (whatever that would quickly come to mean!); on the other hand, PENTANA assumes atomic warfare.” This was the crux of the problem with the Pentana Study for Johnson. If atomic weapons had to be used, that indicated inferiority in the combined arms of the United States against the Soviet Union. He believed the Study’s assumptions were wrong in that area and the US had a “more modest superiority” that did not require the use of atomic weapons to exploit. If there was no superiority, then “maybe decision by air warfare [strategic nuclear bombing] is the answer, after all. But only . . . in a nuc[lear] war; and, even then, perhaps only by our taking the initiative.” [Emphasis in the original] 54

Davidson echoed Johnson’s concerns, bluntly stating: “I shudder every time I think of the stature that PENTANA has attained.” Davidson feared that the Army would adopt the Study, with little solid experiential or technical basis, in its entirety. “What passes for a concept [of operations] is a series of sketchy generalities that are based on unreal assumptions and are completely unpersuasive as to the ability of the ‘nibbling’ . . . type of operation to achieve success in a manner entirely contrary to historical experience. It scares me!” Davidson and Johnson believed that the Pentana Study offered a path for experimentation by elements of the Army, but not a lane for reorganization of the Army wholesale.
Johnson also shared with Davidson a letter he had earlier sent to Major General Edmund Sebree, CONARC Chief of Staff. In it, Johnson explained his disagreement with the Pentana Study and his reluctance to sign the War College’s response to it. Though Johnson did approve the College’s position on Pentana, he wanted Sebree to understand that he, Johnson, was not fully convinced the Study was grounded in reasoned logic. Force projection of pentagonal divisions or their battle groups demanded air superiority to get in and supremacy to sustain the force; Johnson could not accept that. The Pentana Study deemed acceptable the use of atomic weapons and chemical or biological agents to defeat the Soviets, but to use them required an Air Force powerful enough to get through. Since that was unlikely in Johnson’s mind, a combination of air-ground operations was necessary to achieve success as long as the Air Force was willing to do what was necessary to support the Army. If the Air Force was unwilling to support with transports and tactical air support, the Pentana Study was not feasible. Johnson summarized his comments with: “I would defer adoption of the PENTANA concept of operations as the sole concept for the army of the future until the results of war gaming and field testing have come under critical review.”

As Commandants of the Army’s two highest educational institutions, the dialogue between Johnson and Davidson indicated how strongly some elements within the Army objected to the Pentana Study. As the Study gained exposure throughout the Army, students at both the War College and the Command and General Staff College also questioned both the organization and the concepts behind its employment. Carlisle student papers from 1956 either accept the Pentana Study or reject its premise in total.
Students from CGSC scoffed at the ideas presented in their “Pentomic Army Organization” classes as being fanciful and ridiculous. Yet, as winter faded to spring 1956, the Army Staff was examining the details of the decision for future organizations. The Final Report on Exercise SAGEBRUSH was complete and circulating among the Army leadership. As mentioned previously, the report was not well received. 3rd Infantry and 1st Armored Divisions, reorganized under the ATFA study, performed their missions, but recommendations from the individual division commanders still favored increases in troop strength. Even Davidson, whose Leavenworth based study group participated in Exercise SAGEBRUSH, took the time to send a personal letter to General Willard Wyman, the new Continental Army Commander, to express his feelings on the division structure. Davidson, who did not agree with Chief of Staff Taylor’s desire for a “‘lean’ or austere division,” enthusiastically recommended an infantry division of eighteen thousand.

Wyman’s reply indicated how far out of touch Leavenworth, the center of Army doctrine, was with Taylor’s own views. The CONARC Commander indicated that the infantry division was going to be reduced and savings would be achieved through the upward migration of some combat and combat support functions. Rather than creating a division that resembled its Korean or World War II predecessors, the new division would fight as an integral element of a corps and field army. Interestingly, neither Davidson nor Wyman addressed the issue of the integration of the division logistical systems to the Corps and Field Army Support Commands. Yet this was a problem that had manifested itself time and time again. Indeed, if Exercise SAGEBRUSH proved anything, it showed that the higher support commands could not accomplish their missions smoothly. But the
Pentana concepts of logistical support were not much better than those proposed for SAGEBRUSH.

As the two studies collided at the Army Staff level in early 1956, a decision was required to determine which structure to adopt. The Army Staff convened an ad hoc committee that concluded that the ATFA model would not provide a smaller, more powerful division. The Pentana Study provided a better organizational structure that was in line with the Chief’s guidance, but still presented problems for employment and sustainment. The ad hoc committee recommended that the Pentana Study receive further study and war gaming but urged no significant reorganization until this was complete, technological improvements had been made, and all new equipment was in place.60

On 12 May 1956, the Army Staff’s senior leadership assembled in a Pentagon room to receive a briefing on the optimum organization of the Army in the coming decade. They all listened carefully as the G3 briefer described the pentagonal organization, its strengths and weaknesses, and the Army staff’s positions and recommendations. The briefer summarized the presentation with several requirements for CONARC to meet before any further decisions could be taken on the Pentana Study. The general officers present then shifted to a discussion of the Army Staff’s positions and recommendations, with the CONARC Commander arguing against the Army Staff. The argument centered on the value of the Pentana Study in the early part of the decade. The Army Staff wanted revisions and further study to refine “organizational and operational concepts for the 1960-70 period” before accepting the Pentana Study. The CONARC position acknowledged the requirement for further study, but accepted the Pentana Study as a benchmark for shifting the Army’s organization based on the ATFA studies and
exercises, projected studies and exercises, and refinement of the organizational and operational concepts. CONARC stood for immediate implementation while the Army Staff recommended further analysis.

General Taylor, in his role not only as Chief of Staff, but also as chief visionary for the Army, decided in CONARC’s favor. He told the assembled Army Staff officers to “avoid undue conservatism” and to “be progressive in its thinking and approach to new ideas.” The Army Staff would impose no requirements on CONARC and the latter was to continue its developmental work, sending requirements up to the Army Staff. He further directed that “the concepts in the PENTANA ARMY study will be approved . . . as goals or objectives to provide organizational, planning, and research and development guidance . . .” Taylor also wanted CONARC “to develop a detailed plan for phased transition to the PENTANA organizations.” Taylor reconfirmed his guidance in a letter to Wyman on 1 June that enumerated all of the decisions from 12 May. The die had finally been cast: the Army would reorganize itself in line with the Pentana Study.
1 Ridgway’s attitudes towards the other chiefs and Eisenhower’s policies are outlined in Chapter 1. He also expressed his opinions to the NSC on 3 December 1954, as directed by the President, wherein Ridgway clearly indicates massive retaliation is an unacceptable form of national security. A better balance of ground and air forces were necessary, Ridgway believed, to counter the different forms of communist aggression in the world. Gavin, as the Army G-3, also supervised the preparation of potential questions and answers for Ridgway’s presentation; those potential answers also indicate the required balanced mix of forces, contrary to current national security policy. Presentation by Chief of Staff to NSC, 3 December 1954; Assistant Chief of Staff, G3, Operations, Memorandum for CSA, subj.: “Possible Answers to NSC Queries,” no date, both USAMHI, Carlisle, PA.

2 Maxwell D. Taylor, Swords and Ploughshares (New York: W. W. Norton & Co., Inc., 1972), 156-167 is the retrospective view where Taylor claims he began the implementation of the “Flexible Response” doctrine in 1955. He expressed an amount of curiosity at being questioned by the President and Secretary Wilson about his loyalty to their policies prior to be appointed. Taylor further described his fall from grace as 1955 progressed, 170-171.

3 Taylor, 152-153; the Republic of Korea (ROK) 27th Division was field tested in February and March 1954. One of the key assessments from the test was the advice to “‘live above our experiences’ and design for the future and not be content just to design a better division with which to have fought past battles.” This new design created 36 rifle
companies in the new organization, opposing 27 companies in the present Korean
division organization; Matthew D. Taylor Papers, National Defense University,
Washington, D.C.

4 Taylor, 131-137, for time as DCSOPS; Condit, 47-55, for CSA period. Some examples
of the controversies Taylor had to manage are in Condit, 59-78.

5 Taylor, 164-166, where Taylor expresses his focus upwards.

6 USAWC, Advanced Study Group, Project Binnacle: Concepts and Doctrine for Future
Warfare, Conventional or Nuclear, 1960-1970, 14 January 1955, iv, 41-46, 181-183,
187-190. Two-sided atomic war meant that both NATO and the Warsaw Pact would use
atomic weapons, though which side started the nuclear exchange was always unspoken.
Also, Binnacle forecasted vertical take-off and landing (VTOL) aircraft and
convertiplanes that had the characteristics of both an airplane and a helicopter, much like
today’s USMC MV-22 “Osprey.” In addition, it projected the development of “tough,
resilient plastics” and “nylon armor” for use with the armored force, 12.USAMHI,
Carlisle, PA.

7 Project Binnacle, 77-84.

8 It is interesting to note the emphasis on aerial resupply. Given the influence of the ex-
Nazi generals and their Army- and Air Force-sponsored writings of the early fifties, only
two Air Force studies dealt with the Luftwaffe’s aerial resupply problems in North Africa,
Demyansk, and Stalingrad, or anywhere else the Germans fought. Kevin Soutor, “To
Stem the Red Tide: The German Report Series and Its Effect on American Defense
Doctrine, 1948-1954,” The Journal of Military History, 57, 4 (October 1993), 653-688,
does not address any issue from the *Luftwaffe* perspective. However, Richard Suchenwirth, *Historical Turning Points in the German Air Force War Effort* (Montgomery, AL: USAF Historical Division, Research Studies Institute, Air University, June 1959; New York: Arno Press, 1968) and Fritz Morzik, *German Air Force Airlift Operations* (Montgomery, AL: USAF Historical Division, Research Studies Institute, Air University, June 1961; New York: Arno Press, 1968) clearly spell out why a ground force does not want to depend on aerial resupply. Obviously, these reports and their information were not readily available to the Project Binnacle writers or those that followed.

9 *Project Binnacle, 25.*


12 Comparison of various TO&E: TO&E 7-12T ATFA (June 1955), Headquarters and Headquarters Company, Combat Command, Infantry Division; TO&E 7-15 ATFA (September 1954) Infantry Battalion, Infantry Division; TO&E 7-15T ATFA (June 1955) Infantry Battalion, Infantry Division; TO&E 7-25 ATFA (September 1954) Armored Infantry Battalion, Armor Division; TO&E 7-25T ATFA (June 1955) Armored Infantry
Battalion, Armor Division; TO&E 17-25 ATFA (September 1954) 90mm Gun Tank
Battalion, Armor Division; TO&E 17-25T ATFA (June 1955) 90mm Gun Tank
Battalion, Armor Division, all USAMHI, Carlisle, PA.

13 Comparison of various TO&Es: TO&E 29-5 ATFA (September 1954) Support
Battalion, Infantry Division; TO&E 29-5T ATFA (June 1955) Support Command,
Infantry Division; TO&E 29-7 ATFA (September 1954) Transportation and Supply
Company, Support Battalion, Infantry Division; TO&E 29-7T ATFA (June 1955)
Transportation and Supply Company, Support Command, Infantry Division; TO&E 29-
11 ATFA (September 1954) Support Command, Armor Division; TO&E 29-11T ATFA
(June 1955) Support Command, Armor Division; TO&E 29-25 ATFA (September 1954)
Transportation and Support Battalion, Support Command, Armor Division; TO&E 29-
25T ATFA (June 1955) Transportation and Supply Battalion, Support Command, Armor
Division; TO&E 11-5 ATFA (September 1954) Signal Battalion, Infantry Division;
TO&E 11-5T ATFA (June 1955) Signal Battalion, Infantry Division; TO&E 11-55
ATFA (September 1954) Signal Battalion, Armor Division; TO&E 11-55T ATFA (June
1955) Signal Battalion, Armor Division, all USAMHI, Carlisle, PA.

14 LTC Dickey, Section 1, “General Information on Organization and Functioning of
ATFA-1 Field Army Corps, Infantry Division, and Armored Division,” to Appendix B
“Organization and Functioning of the ATFA-1 Field Army,” to Edgar L Shriver,
Washington University, Human Resources Research Office, May, 1956) 3; Moenk, 203-
205.
HQ, 4th Army, Fort Sam Houston, Texas, Final Exercise Report Exercise SAGEBRUSH, 18 February 1956, Part I, Summary, 1, USAMHI, Carlisle, PA; Moenk, 203-205; ltr, MG William S. Biddle, CG, 1st AD, to MG Robert L. Howze, Jr., Chief, Korean Military Advisory Group, upon notification that the latter would take command of 1AD in July 1955, Biddle Papers, USAMHI, Carlisle, PA. The letter describes Biddle’s assessment of 1st AD’s reaction and probable structural changes as a result of both BLUE BOLT and SAGEBRUSH.


HQ, 4th Army, Report of Army Tests, Exercise SAGEBRUSH, Part I Summary, 4, USAMHI, Carlisle, PA; Wilson, 267-269; Moenk, 210-214; Alexander M. Mood, Survey of SAGEBRUSH Communications Data, Report #57-4, General Analysis Corporation, Santa Monica, CA in conjunction with the U. S. Army Electronics Proving Ground, Fort Huachuca, AZ, March 1957, described the system in very glowing terms. It described the grid centers as easily displaced to stay abreast of unit maneuvers. The negative portion of the report indicated the unrealistic nature of the scripted communications did not give a true picture of what communications would be between combat commands and division elements in actual combat.


Shriver, 15-18, 28-40.
20 Doctrinal and Organizational Concepts for an Atomic-Non-Atomic Army, 1960-1970
(Fort Monroe, VA: Headquarters, Continental Army Command, 14 December 1955)
(hereafter cited as Pentana Study), USAMHI, Carlisle, PA.

21 Pentana Study, Volume 1, 1-2.

22 Ibid, 2. The first section of the Pentana Study contained two subsections, the first titled “Assumptions” and the second titled “Facts Bearing on the Problem.” While all of the information contained in both sections appear as assumptions to readers today, to the planners of the fifties, the distinction was important. The assumptions were key planning factors upon which the Pentana Study was based; the facts were accepted as truths, despite the “fact” that most of the considerations listed were not true.

23 Ibid, 2-3.

24 Ibid, 4.


26 Ibid, 9.

27 Ibid, 10.

28 Standard infantry division numbers from TO&E 7R, Infantry Division, February 1955, and TO&E 7-11R, Infantry Regiment, February 1955, USAMHI, Carlisle, PA. Numbers for the division are from the Pentana Study, Volume I, 7.


31 Ibid, 8-9.
32 Ibid, 9.


34 Ibid, 31.


36 Letter, AWC to CG, CONARC, subj.: “Doctrinal and Organizational Concept for an Atomic-Non-Atomic Army During the Period 1960-1970, Short Title: PENTANA Army,” 16 November 1955, CARL, Fort Leavenworth, KS.

37 Ibid, 5-6.

38 Disposition Form, Chief of Advanced Operations Research Department to Chief Combat Developments, CGSC, Fort Leavenworth, 4 October 1955, 1, CARL, Fort Leavenworth, KS.

39 Ibid, 3-4.

40 Ibid, 3.


42 Ibid, 4.
Ltr, Major General Charles V. Bromley, Commandant, Armored School, Fort Knox, KY to Commander, Continental Army Command, Fort Monroe, VA, subj.: “Comments on PENTANA Army,” 1 November 1955, 2-3, CARL, Fort Leavenworth, KS. This is an interesting argument since the exact opposite argument was being used to justify why the armor force needed more money to upgrade its tanks; the Soviet tank was estimated at being far more capable than any U.S. tank.

Ibid, 4-6.

Ibid, 6-8.

Ibid, 8.

Briefing, undated, for Major General Williams, Commandant, The Artillery and Guided Missile School, Fort Sill, OK, CARL, Fort Leavenworth, KS.

Letter, Commandant, The Engineer School, Fort Belvoir, VA to Commandant, CGSC, Fort Leavenworth, KS, subj.: “The Engineer School Comments on CONARC PENTANA Army Study,” 4 November 1955, Section I, 1, CARL, Fort Leavenworth, KS.

Ibid, Section II, 1. The Pentana Study also contradicted the Engineer School’s own Development Board’s March 1955 study titled, “The Army of the Future” which essentially predicted an ATFA-type division, corps, and army organization. It, of course, called for more engineers because the demands of nuclear war required more digging in and repair of road networks; Engineer Developments Board, “The Army of the Future,” The Engineer School, Fort Belvoir, VA, 10 March 1955, USAMHI, Carlisle, PA.

Ibid, Section II, 2-3; Section III, 2-4; Section IV, 1-6.
51 Ltr, LTG Samuel D. Sturgis to General John H. Dahlquist, subj.: “Doctrinal and Organizational Concept for an Atomic-Non-Atomic Army During the Period 1960-1970,” 20 October 1955, 1, CARL, Fort Leavenworth, KS.

52 Ibid, 5.

53 Ibid, 7.

54 Letter, Major General Max Johnson to Major General Garrison Davidson, 12 January 1956, 2, CARL, Fort Leavenworth, KS.

55 Letter, Major General Max Johnson to Major General Edmund Sebree, 16 November 1955, 3, CARL, Fort Leavenworth, KS.

56 Samples include Frank W. Norris, “Divisional Command for 1960-1970” and Edward C. D. Scherrer, “The Role of Armor in Future Warfare” which accept the Pentana proposals as the basis for their arguments versus Edward G. Allen, “Standard Combat Division” and Wilson M. Hawkins, “The Armored Division in Atomic and Non-Atomic Warfare” which favor the well-understood triangular divisional structure. The latter two AWC students suggest minor improvements to the division, but reject any radical reorganization as a result of or based on atomic weapons. All reports, USAMHI, Carlisle, PA.


58 Wilson, 267-269.

59 Ltr, MG Davidson to LTG Wyman, 21 February 1956; Ltr, GEN Wyman to MG Davidson, 23 March 1956, CARL, Fort Leavenworth, KS. Davidson departed Fort
Leavenworth soon after this exchange to become the Superintendent of the U.S. Military Academy.

60 Report, DA Ad Hoc Committee to Council of Deputies for Presentation to the CSA, Subj.: “Pentana Army,” April 1956, CARL, Fort Leavenworth, KS. Gavin also briefed this committee; he was still a firm believer in nuclear war, mechanization, and aerial resupply. Though his comments were summarized, one can only imagine the impact his presentation must have had on the committee members, Summary of Comments from LTG Gavin to the DA Ad Hoc Committee to Council of Deputies for Presentation to CSA, subj.: “Pentana Army,” no date, CARL, Fort Leavenworth, KS.

61 Memorandum For Record, Office of the Deputy Chief of Staff for Military Operations, subj.: “Briefing for Chief of Staff on Army Organization 1960-70 (PENTANA),” 15 May 1956, 2, CARL, Fort Leavenworth, KS.

62 Ibid, 2, 5-6

63 Ltr, Taylor to CG, CONARC, subj.: “Army organization,” 1 June 1956, w/ inclosures, USAMHI, Carlisle, PA.
CHAPTER 4

THE ARMY’S ALTAR OF TECHNOLOGY

In the Cold War, the United States aggressively pursued the lead in technological innovation. The nation’s scientists created the atomic bomb in the mid-forties and the hydrogen bomb in the early fifties. By the mid-fifties, technology had brought the jet fighter and the nuclear submarine to the military. But the benefits did not stop with the small portion of society associated with warfare. The scientists of the United States had refined television, the modern kitchen, the ubiquitous automobile, and a transportation system second to none on earth. Consequently, nothing seemed beyond the capabilities of America’s scientific community coupled with the nation’s economic prowess. The Army planners who developed the Pentana Study shared this fascination with technology. Indeed, in many respects, the pentagonal division and its battle groups were predicated on the application of a variety of new technologies in three areas: firepower, mobility, and communications. This chapter describes the Army’s efforts to develop these technological systems and the problems that were encountered.

The division’s first requirement was firepower. Operating on the nuclear battlefield required units to have protection from the effects of nuclear weapons, but also
to be able to continue fighting. They needed to be maneuverable enough to avoid being overrun by Soviet tanks and yet be able to deal devastating blows to their opponent. The Research & Development (R & D) office at the U. S. Army Armor Center, Fort Knox, Kentucky undertook the task to develop the next generation of tanks with these requirements in mind. The Ordnance Center at Aberdeen Proving Grounds, Maryland, was charged with developing the optimal fragmentation munitions that would allow conventional weapons to greatly expand their destructive power. The Ordnance Center at Redstone Arsenal, Alabama was designated with creating the DART anti-tank system that would allow the individual infantryman to destroy the masses of Soviet armor that were expected to pour into Western Europe. The last firepower improvement to the division’s firepower was for the benefit of the division and battle group commander. Because of the narrow zone or sector assigned, a World War II-model division commander could influence a battle by allocating his organic divisional artillery to specific units. But on the projected atomic battlefield, the distances would be so great that the division artillery could not provide fire support for the dispersed battle groups. As a result, the Pentana division’s artillery was reorganized around two weapons, both nuclear capable: the Honest John missile, developed at Redstone arsenal, and a still unnamed experimental division artillery weapon, to be developed at Fort Sill, Oklahoma. Both were designed for the division commander’s use. In addition to the artillery support from division, the battle group commander had a weapon at his disposal that was also nuclear capable, the “moritzer,” also to be developed at Fort Sill.

The second major technological requirement was enhanced mobility. Infantry units had proven very susceptible to nuclear blasts during Exercises FOLLOW ME,
BLUE BOLT, and SAGE BRUSH. Dispersion was the obvious answer to offset the effects of a nuclear blast. If dispersion was essential to survival, its corollary was the requirement to concentrate rapidly to attack an enemy or to take advantage of a battlefield opportunity. Therefore, a vehicle to carry the infantry had to be designed around the parameters of speed, protection, and troop carrying capacity. The armored personnel carrier was the result; it was to be used by the entire battle group. A joint venture between the armor and infantry communities, both Fort Knox and Fort Benning were involved in its development.

Last, a Pentana division equipped with new armored personnel carriers and augmented with new tanks operated in a greatly expanded battlefield. To tie his dispersed units together, a division or battle group commander had to be able to communicate over much greater distances than had been required in the Korean War. Consequently, the U. S. Army Signal Center at Fort Monmouth, New Jersey, had to develop the new signal equipment that connected the division and battle group elements. Advances in radio technology increased the power and extended the range of radio transmissions and did it under the test conditions of Exercises FOLLOW ME, BLUE BOLT, and SAGEBRUSH.

In 1956, every expectation was that these systems would be available to the pentagonal division commander and his organization in the near future. As the Army’s chief of R & D understood it, nuclear warfare was the only future for the Army; the service moved in that direction to rectify the obvious shortfalls. The reality of technological developments, the Army budget, and political infighting proved otherwise.
American experience in World War II confirmed the tactical power and operational potential of armored warfare. Not only were U. S. military theorists convinced of the idea, but other military experts, mainly Nazi generals, emphasized the idea as well. British military theorists J. F. C. Fuller and B. H. Liddell Hart, both highly regarded at the time, endorsed armored concepts in their post-war writings. Korean experience also dictated that American armor development needed to shift away from tank-supported infantry operations to interdependent combined arms operations. To make the shift, the M4A3E8 “Sherman,” the M24 “Chaffee,” and the M26 “Pershing” tanks, all created for World War II and used in Korea, had to be replaced.

Adequate for World War II, the M24 and the M26 would not stand up under the effects of nuclear warfare. These tanks provided neither sufficient protection against the blast nor sufficient speed to take advantage of a friendly blast. Furthermore, Soviet tanks outgunned and outmaneuvered the American tanks by the end of World War II and that trend continued into the fifties. Yet post-war developments did little to alleviate the shortfalls. The “new” medium tank that entered service in 1953, the M46 “Patton,” was only an updated version of the M26. The M46 was little more than a 90mm cannon mated to the older M26 chassis. The suspension, fire control, and electrical system remained the same, and the major change was the addition of a Continental V-12 engine that generated 810 horsepower but did not improve the tank’s operating range. Other
changes were a significantly better automatic cross drive transmission that gave the driver significantly greater, yet simpler, control of the tank. These improvements were incremental, however, and the M46 was designated an interim tank, forced into service only because of the demands of the Korean War. It was overmatched in firepower and armor by the new generation of Soviet tanks, notably the T54, and was barely a match for the World War II generation of tanks that had been issued to the Warsaw Pact forces, especially the JS III tank.

United States tank development is a study in itself, but important to the study of the Pentana division is the focus provided to armor innovation by alliances and atomic weapons. As the Cold War rose in priority among western policy and military circles, the economic benefits of joint development of military items became apparent. Motivated by the NATO Treaty of 1949, the United States, the United Kingdom, and Canada agreed to jointly study armored requirements for the future. The 1951 Tripartite Conference established particular responsibilities, agreeing to retain the light, medium, and heavy tank force concept of World War II, but identifying necessary improvements. The United States was chartered with developing the light tank, intended for reconnaissance, security, and airborne operations only. Replacing the M24 “Chaffee”, the M41 “Walker Bulldog” was the result. Based on 1947 designs, the M41 was modified to meet the needs of the Tripartite Conference and entered service in 1951. Though inadequate for its intended purposes, the M41 remained the Army’s light tank through the fifties.

The medium and heavy tanks were to be truly joint ventures. The UK and the US developers intended to design separate guns, ammunition and chassis, then conduct
competitive tests to determine the best. Eventual incorporation of the winners into a single design would satisfy the requirement for both types of tanks. Neither of the nations had an acceptable medium or heavy tank at the time of the conference. The American developers continued work on the upgraded version of the M46, already designated the M47 “Patton,” to produce an even better interim medium tank, the M48. The British continued refining their medium tank, the “Centurion,” and developed a heavy tank, the “Conqueror.” Interestingly enough, the 1951 Conference Report called for a 105mm cannon on the medium and a 120mm cannon on the heavy tank; neither goal was achieved in US tanks for ten years.8

The Tripartite Conference not only developed a common goal for the three nations tank development programs, it also set parameters for the tank development. Atomic warfare did not dominate the discussions. Rather, Major General J. H. Collier stressed the following as guidelines: “simplicity with attendant reduction of maintenance, economy of operation with emphasis on fuel economy, high production rate, low cost, reduced weight, and reliability.”9

The Tripartite Conference focused the refinement of tank design issues for the mid-fifties and was meant to cover the near term deficiencies of 1951-1956 only. With the next international conference scheduled for 1955, the Armor Center combat developers needed to refine their proposals to cover the end of the decade and into the sixties. Coincidently, in 1954 General Ridgway directed the Army Staff to study improvements in Army equipment. Once received at AFF, General Dahlquist directed the Armor Center at Fort Knox to review the results of the 1949 Report of Army Field Forces Advisory Panel on Armor and update the five-year-old recommendations. With
the 1949 Report in hand and anticipating the 1955 Tripartite Conference, a new Advisory Panel was convened at Fort Knox in August. Major General Leander L. Doan chaired the group of armor experts, which included Brigadier Generals Hamilton Howze and William Westmoreland, and Colonels Creighton Abrams, Welborn Dolvin, and James Polk as members of the panel.\textsuperscript{10}

Atomic warfare again dominated the assumptions and requirements of the 1954 Advisory Panel, just as it had influenced the 1949 Panel report. The period 1958 to 1962 was the focus for the report; operating in a nuclear environment was essential. Assumptions that “the decisive engagements of any war will be fought on the Eurasian Land Mass” and “war during the period . . . may or may not entail the use of nuclear weapons” were key elements of the Advisory Panel’s report. Cross-country mobility for combat and logistical forces was emphasized because of the potential destruction from nuclear bombs; air movement and airdrop resupply were also essential. Other requirements emphasized “open and fluid warfare,” “war of movement rather than stabilized warfare,” “dispersion of forces to offset enemy use of mass destruction weapons,” and “dispersion in warfare and the resultant necessity of massing in time rather than space.”\textsuperscript{11} The Advisory Panel accepted the prevailing assumptions that any continued developments of armored systems be optimized for the European theater and atomic war. It also accepted the prevailing assumption that if tank design met the requirements of atomic war, then it would meet the needs of conventional war as well. Finally, the Advisory Panel sustained the 1951 recommendation for three types of tanks.

To meet the recommendations of the Panel, developmental work continued along several lines. The follow-on to the M41 was intended to fix the identified problems of
inadequate range, excessive noise, and excessive weight. Three light tank models were in development as of 1954, however only two received the Conference’s endorsement. The T49, with a 90mm gun, was “in pilot stage” and “undergoing engineering tests.” The T71 and T92, equipped with the same 76mm gun as the M41, were only in “full-scale mock-up stage.” The experts recommended the latter two because “they may reasonably be expected to meet light-gun requirements now projected for the interim period [1958-1962], assuming a calculated risk in respect to main armament effectiveness.”12 In other words, the two designs that had not yet reached prototype production – being in mock-up only – showed more promise than the design close to completion. The T49 was terminated and the two newer designs, based only on the promise of technological advancement, were recommended for further study. But, by the time the Pentana Study was approved by Taylor, the T71 had already been discontinued due to inadequate progress.13

For the medium and heavy tank designs, the conference recommended a dual track of development. The current medium tank, the M47/48, was to receive a more powerful engine, a better transmission, and more efficient armament.14 As for a new medium tank, the experts decided to trust the future to promising developments in technology. The TL-1, was “a medium-gun tank concept at projected weight of 41 tons, mounting a high-performance 90mm smooth-bore gun and capable of accepting either an appropriate developmental or conventional engine.” Another, the TL-4, was heavier at 45.25 tons and was to be equipped with 105mm gun. The last design, the TS-31, was “a limited traverse, substitute vehicle for the heavy-gun tank at projected weight of 45 tons, mounting the conventional 120mm conventional gun.” With mock-ups of each design
and the availability of “new guns and ammunition . . . by 1958,” a combination of two of
the three designs would be selected for further development – in 1958.15

The heavy tank design was suffering under the weight, literally, of excessive armor. The T43 design, in testing at the time of the Advisory Panel, came in at over 60 tons. This was clearly unacceptable since current tactical bridging, actual highway bridging, and long-haul lowboy truck trailers could not accommodate the task. Again, the Panel experts decided to propose the dual-track approach: continue to invest in the improvement of the T43 while also investing in a new, currently undeveloped heavy tank. The T43 had already evolved into the T43A1, then being service tested, and would soon be upgraded to the T43A2, expected by 1955. The upgrades included relocation of the gunner, an integrated fire control system, and a turret basket containing the crew and turret armament.16 Developmental guidance for the next heavy tank centered more on the turret and gun combination than on the chassis, the T43 chassis deemed best for any heavy tank. Three different variants were proposed. One contained a 120mm gun, an automatic loader, and a hydraulic-electric turret and fire-control system, which could not elevate or depress the gun to acceptable standards. Another experimental turret was essentially the same, but weighed five tons less. The third turret was very different, adding weight to produce a 66-ton tank. It proposed a 155mm gun, automatic loader, and ten rounds of additional ammunition. Considering the weight and the failure to meet elevation/ depression standards, this turret design was quickly eliminated.17 In fact, shortly after the Advisory Panel completed its report, the Army rejected the concept of heavy tank battalions, deactivating those so labeled, and turned the T43 tanks over to the Marine Corps for its use.18
Armored firepower remained an important component for warfare in the mid-fifties. The 1954 Armor Advisory Panel, as the principal examination of armored trends at the time, retained the older, conservative approach to warfare and reconfirmed the need for three types of tanks. Further, it recommended a dual track approach to tank development. On one hand, the Panel recognized the Army had to be prepared to fight in the present, thus the M41 and M48 tanks continued in production. Both models, and the T43A1 heavy tank, received funds for product improvements to identified deficiencies. On the other hand, the future promise of technological advancement in armament, power drives, and armor plating received clear recognition. Developments in the UK smoothbore gun and the US rifled gun were examined for range, accuracy, and tube life. Engine and transmission improvements in power, size, and ease of maintenance were expected to be rapid and continuous. The development of armor plating continued with experiments in improved steel and combination steel-silica armor or steel-glass appliqué armor. Thus tank developers were constantly rotating limited funds between current product improvements and future developments.

The Pentana Study was approved based on the technological improvements proposed by such reports as the Armor Advisory Panel’s. However, any reorganization along the pentagonal lines proposed by the study would have to use the equipment on hand and available, the M41 light tank and the M48 medium tank. The light tank was restricted to reconnaissance squadrons, while the M48 filled in all the tank battalions of the proposed tank brigades at corps level. Taylor’s calculated risk in adopting the Study was that improved equipment would arrive soon enough to make the Pentana organization as powerful as the Pentagon charts showed it to be.
Optimum Fragmentation Munitions

One of the powerful pieces of the Pentagon charts was a new type of ammunition: the optimum fragmentation munition. This type of ammunition was intended to be a large version of a shotgun shell; all types of weapons – from rifles to artillery shells – were to have rounds that contained multiple bullets inside it. These multiple bullets rounds would split apart in flight and create a shot pattern much like a shotgun, except on a much larger scale. The Ordnance School devoted much time to the project, but did not have any fully developed rounds by 1956. The challenge for the combat developers with this type of munition focused on the ballistic characteristics of the round: sustained flight of the numerous projectiles could not be assessed. Therefore the projected target area varied each time a round was fired, a critical failing when tank and artillery rounds were employed. The optimum fragmentation munition would have to wait for technology to catch up to the idea.

The DART Anti-Tank Guided Missile

The offensive capabilities of armored organizations was not lost on the CONARC designers; powerful tank units had to exist to exploit the successes of the mechanized divisional battle groups. Yet the tank units could not be deployed in the Pentana division for several reasons: cost per tank was high; production capacity was low; excellent and inexpensive anti-tank weapons existed as alternatives to tanks. More importantly, the U.S. had fewer tanks than the Soviet armies and would never reach quantitative equality.
Though the Armor Center opposed the elimination of armored divisions, it supported the desire to retain tanks as a counterforce to Soviet penetrations in NATO’s forward defenses. With a smaller number of tanks available, it made sense to concentrate them where they could be best employed and not disperse them into penny-packet groupings with mechanized infantry divisions. Without tanks, the infantryman needed a method to counter the Soviet tanks. This is the essence of the new reliance on the DART. This weapon was to be the savior of every infantryman and also allow armored formations the freedom to launch mass armored assaults.

Anti-tank weapons certainly existed before the Pentana Study was adopted. The World War II rocket-firing 2.36-inch bazooka existed in quantity after the war was over, but proved ineffective against North Korean (Soviet) armor. Later upgraded to a more powerful version, the 3.5-inch bazooka was still in service as a close-in anti-tank weapon in the late fifties. For more extended ranges, the Army hoped that the recoilless rifles of various calibers could provide sufficient anti-tank protection. The challenge for the scientific community of the fifties was to create a weapon, capable of being carried by an infantryman, which filled the gap between the three hundred yard range of the bazooka and the thousand-yard range of the recoilless rifle. By the early fifties, the answer appeared to be the guided missile.

As missile technology grew, it was apparent to many that the large-scale missiles could be made smaller and more portable. By 1951, the military characteristics of the desired weapon had been established: light enough and compact enough to be carried by one soldier; a maximum effective range of six thousand yards; and a hit and kill probability of ninety percent against the heaviest enemy tanks. \(^{21}\) Several models of a
rocket-based anti-tank weapon existed in 1952. A joint Army-Navy venture created a new weapon that would double as an anti-tank rocket and a Navy torpedo. The D-40 “Cannonball” munition was a spherical missile that was radio-guided to its target. The 24-inch diameter weapon was very destructive, but its excessive weight – three hundred pounds – eliminated it from the normal infantry squad’s repertoire of anti-tank weapons.22

The French defense industry also created a rocket-propelled anti-tank weapon that held great promise. The SS-10 guided missile was the result of French development of a German prototype from World War II. It was “an optically-guided, wire-controlled missile” that “carried a 8.9-pound shaped-charge warhead for an optimal range of about 1,500 yards.” The U.S. Army became so interested in this weapon that funds were allocated to purchase “500 SS-10 missiles and 3 complete sets of associated ground equipment” from the French in early 1952.23 Through the remainder of 1952 and into the following year, the Ordnance Corps and evaluators from the Infantry School and the Marine Corps tested the weapon for possible inclusion in the U.S. inventory. Though their tests ultimately found the purchased version of the SS-10 unacceptable, there were enough lasting impressions that the Ordnance Center remained interested in the weapon and closely monitored its development.

In August 1952, the Aerophysics Development Corporation of Pacific Palisades, California presented a similarly designed weapon. The scientific presentations of the weapon impressed the Ordnance Corps, mainly because it was an American version of the SS-10, and initial contracts were let to finish the design work for the weapon, called the DART. It was just over five feet in length and weighed nearly 85 pounds, but
delivered a 20-pound shaped-charge against the target. Like the SS-10, it was optically tracked and wire-guided by a ground-based observer. Most importantly, its minimum distance before arming was less than 300 yards, just outside the close-in area already well covered by the bazooka. Its maximum effective range was in excess of three miles; thus it easily duplicated the current and projected range of both the recoilless rifle and tank gun. The DART system filled the gap for infantry use that CONARC was seeking in its Pentana Study.24 Furthermore, it seemed a very simple weapon and offered the promise of being very inexpensive to produce.

After numerous tests and studies, the Aerophysics Corporation was ready to enter into full production contract with the Army. Several challenges still remained, however. Though drawings and initial wind tunnel tests showed the DART met the prescribed military characteristics, the final development of the guidance systems, the motor and propellant, and the warhead and fuse had yet to be accomplished. Simultaneous with the SS-10 tests, the trials to bring together the parts of the DART also continued. Though Aerophysics had promised a developmental program of less than two years, the incorporation of the initial guidance system was plagued with problems. The guidance system wires, which uncoiled from bobbins mounted on the horizontal wings of the missile while in flight, frequently broke before the missile hit the target; without the wire link, the missile became unguided and hit the target only through luck. If the wires struck anything while in flight, like a tree or shrub, they snapped and the missile grounded out. The missile’s propulsion system produced a dense smoke cloud under certain conditions, thus blocking the view of the missile controller. The terminal guidance system, to be
used during periods of limited visibility, was an infrared target seeker that, despite claims to the contrary, never performed to its anticipated capabilities.25

Aerophysics’s challenges continued to grow during 1954, as system after system did not meet performance objectives. The aerodynamic features of the missile, tested and retested in wind tunnels at Moffett Naval Air Station, California, required several modifications to the initial design that pushed back final design completion for several months. Though many elements of the rocket fit neatly into the reinforced fiberglass fuselage, the roll stabilization gyro presented a significant challenge. Aerophysics initially contracted with Bulova Research and Development, Woodside, New York, to produce the final model of the gyro, but Bulova could not meet its contractual obligation and without the gyro, the missile could not fly straight. Another problem that seemed to be easily solved, yet proved endlessly frustrating, centered on the wire guidance mechanism and its bobbin assembly. A suitable wire was eventually found, though it did not prove fully reliable during tests as already indicated. The bobbin itself had to be modified several times to allow not only the proper hand-coiling of the guidance wire, but also the proper uncoiling while in flight. The problem of kinking and wire breakage, much like the gyro component, was never fully solved.26

Experimental test shots of the DART took place at White Sands Missile Range during the second half of 1954. Six of fifteen firings proved successful; the remainder suffered from component failures.27 As the test firings were examined and redesigns went from the test range to the various factories, the cutbacks of the FY55 budget process began to affect production. Instead of a four million dollar operating budget, Aerophysics and its subcontractors worked with half that amount. Furthermore, the
Ordnance Branch asked Aerophysics to develop a program for missile production that could be accomplished incrementally as funds became available. Development obviously slowed and final delivery again slipped to December 1955.28

Ordinance Branch also changed the requirements for the DART at this stage. Instead of a one man firing configuration, requirements now dictated that a two man guidance system be installed in the missile. One man would operate the missile from the launch platform and a second man would be forward to assume control of the missile in final flight. This necessitated the development of an infrared tracker for the forward position and an infrared target seeker for the missile. Though technologically feasible, and a military characteristic described in 1951, this was another step in the process that had not been planned. Final production models again slipped from December 1955 to December 1957 to accommodate the changes.

Aerophysics contracted with the Santa Barbara Research Center to develop the infrared components, but progress was very slow due to technical problems and funding. By the end of 1955, the second date when the DART was supposed to enter full production, the IR seeker was removed from the requirements document for technical reasons. The DART was still not ready for production, even after the annoying IR excursion.29 But optimism still prevailed in the anti-tank missile system offices as glowing reports continued to come out from both the California contractors and the Redstone Arsenal.

It will be recalled that the Pentana Study began to circulate in December 1955 and the Exercise SAGEBRUSH Final Exercise Report came out in February 1956. Both reports showed a heavy reliance on the anti-tank capabilities of the DART. As the
decision approached as to which organizational path to follow, the assumption of a potent anti-tank weapon was reasonable. Even as Taylor decided to end the ATFA studies and proceed with the Pentana organization, there was little reason to believe that the problems of the DART were insurmountable or that the French would produce a better anti-tank missile.

Division Artillery and Nuclear Missiles

As noted earlier, the concept that in future warfare the U.S. Army tactical organizations would have to fight dispersed had been circulating for some time. The physical impact of a nuclear bomb was obvious; the operational and tactical impacts forced the battlefield to become even “emptier” than it had been in World War II. But from a division commander’s viewpoint, the implications were clear: if his command was sufficiently dispersed to avoid nuclear blasts, then his four divisional artillery battalions of 105mm and 155mm howitzers were inadequate to cover his area of operations. The Pentana Study sought to compensate for the larger area by relying on missile technology, such as the Honest John, and a new, undeveloped artillery piece.

The missile battery of the division artillery was the direct result of the Nazi rockets, V1 and V2, used successfully in World War II. Though the production of American versions developed slowly in the post-war economy, the pace accelerated with the advent of the Korean War. What had been seen as a possibility in May 1950, became reality by the end of the year: programs for a large, unguided artillery rocket designed to create great destruction deep in the enemy’s rear had begun. A parallel program also
began to design an atomic warhead for the same rocket, enabling it to serve two purposes: a conventional rocket with artillery-like effects and an atomic rocket with atomic bomb effects.

The Ordnance Center at Redstone Arsenal, Alabama was already familiar with the challenges of rocket development, having successfully deployed the Corporal surface-to-surface guided missile and Nike Ajax anti-aircraft missile. This new missile, called the Honest John, was their first attempt at an unguided, free rocket. As the Korean War continued through 1950, the Ordnance Center focused its R&D efforts to get a tactical rocket to the battlefield as soon as possible. They were undaunted in their faith in the new rocket, but challenge after challenge proved them wrong.31

Douglas Aircraft Corporation, based in Santa Monica, California, won the single source contract for the Honest John development in 1950 because of the urgent requirement to get something out to Korea. It was to build a rocket with a fifteen hundred pound warhead, with a minimum range of eleven miles and a circular error of probability no greater than two hundred yards.32 Maximum effort was made to use existing, off-the-shelf items to speed production of the rocket. As a result, Douglas took for the main power plant the Navy Talos missile solid propellant motor and adopted a spin motor developed at the Jet Propulsion Laboratory, California Institute of Technology. This reliance on existing technology allowed the Honest John to reach the test-firing phase by June 1951.33 The success of these tests sent the Honest John into accelerated production.

Despite its early promise, the slow bureaucracy of Pentagon procedure ensured that production advanced at a snail’s pace. Although giving full production authorization
in August 1951, AFF did not send its detailed military characteristics to the Ordnance Center until February 1952, and these were not finally approved for another year. The lack of official authorization did not stop the rocket’s development, however. In March 1952, the Honest John went into limited production at the same time that Douglas Aircraft was continuing test firings. It was estimated that there would be sufficient rockets to equip five batteries by January 1953. But budgetary and technical shortfalls reduced the quantities of rockets available, while contractual problems with Douglas Aircraft slowed production even further. The first batteries were not equipped until 1954, when the Honest John was finally accepted as a standard item in the Army inventory.

Product improvements continued as the rocket system reached maturity in 1954. In-flight guidance systems were added, a better fuze and warhead assembly was perfected, and the jet-assisted take off spin rocket kit was significantly improved. In addition, a practice warhead was also created that allowed Army units the opportunity to go through all of the procedures to assemble and fire the Honest John. All of the production and procurement challenges had been met by the time the organizational decision on ATFA and the Pentana Study was taking place. The rocket proved itself at White Sands Missile Range and production was proceeding towards the 1954 goal of eighteen hundred weapons. The rocket was so successful that shorter- and longer-range versions of the Honest John were soon written into the contracts. The short-range version, first known as the Honest John Junior, then the Little John, reached developmental prototype in mid-1955. It was intended for use by the airborne division. The long-range version, Honest John Senior, did not make it off the drawing boards and was cancelled.
The last challenge for the Honest John system was the actual launcher for the missile. To function as an artillery weapon, the rocket had to travel under the same conditions that tube artillery did; it had to be able to move over unimproved roads or cross-country. The launcher served as the firing platform for the rocket, which meant it contained sensitive pieces of equipment that could not be damaged during movement. The challenges posed by the launcher development almost kept the rocket from being fielded. Opinions within the senior Army leadership about type and capabilities of launchers varied widely and the contractual military capabilities description was formalized very late in the rocket’s development. Thus the Honest John rocket itself was already in the testing phase before the launcher was even begun.38

The argument rested on the speed of rocket launch and the missile unit signature. AFF preferred a self-propelled launcher. This would require the assembly of each rocket before firing, which required several other pieces of equipment to perform. Not only would it take over an hour to assemble the rocket, but also several vehicles, including a crane, were required to assemble the rocket components. The Army Staff and the Ordnance Center preferred a trailer-mounted launcher, which would facilitate rapid firing and a reduced number of vehicles. They also noted that given the numbers required, mating existing trailers to the firing platforms would be less expensive than building hundreds of self-propelled launchers, an argument that proved a major factor in the decision to pursue the trailer launcher. Though General Collins directed the development of a trailer launcher in April 1952, the Ordnance Center decision was to follow a dual path of a self-propelled launcher and a trailer-mounted launcher. Though two successful trailer concepts were developed, the program was discontinued in May 1953.39
The first self-propelled launcher was a modified 5-ton cargo truck with an A-frame launch rail bolted onto the cargo bed. Though promised for delivery in August 1952 to White Sands Missile Range, for various reasons the launcher arrived in December. It served the test firings much better than expected; contracts for more launchers were sent out in April 1953 to Treadwell Construction Company, Midland, Pennsylvania. Half of the twenty-four contracted launchers were to be delivered in December 1953, the remainder by March 1954; eventual deliveries were only a month late. Treadwell performed exceptional service as all of the essential modifications were identified at White Sands, passed to Rock Island Arsenal, Illinois, which oversaw the launcher production, then to the company for production. In fact Treadwell met the production schedule in time to equip the first eight Honest John battalions.40

As the SAGEBRUSH Final Exercise Report and the Pentana Study circulated among the Army leadership, the benefit of atomic and conventional missiles was apparent throughout the Army. Battalions had the right equipment and conducted their practice firing exercises in full view of units on their bases. Articles in branch publications praised the proficiency and prowess of the new rocket. Model rockets were even placed on the roofs of official cars Army recruiters used in their missions. The Army finally had a weapon system with a powerful warhead that could reach into the depths of the battlefield to attack enemy targets. The Honest John gave division and corps commanders the opportunity to influence the battlefield in a way they had never had. But even though the rocket provided the commanders with a powerful punch, there were very few rockets in the divisional artillery battalion to apply against the large enemy
formations. For the remainder of the divisional artillery, a new and undeveloped artillery piece was necessary.

The challenge for the Artillery and Ordnance communities was to create a weapon that met all the desired characteristics described by the Pentana Study. This new weapon had to “be a lightweight self-propelled weapon . . . with maximum range of not less than 18,000 meters, capable of delivery of atomic and non atomic munitions with increased lethality to replace the present medium howitzer as a divisional weapon.” The new weapon was also to be used during airborne operations and had to weigh less than ten tons. Though CONARC believed such a weapon was capable of being designed and produced, the Pentana Study based its description of battle group and division operations on the use of this new weapon and the Honest John. Despite the Chief of Staff’s decision to proceed with experimentation along the Pentana Study lines, the artillery weapon meant to be the division commander’s complement to his rocket artillery did not exist. To compound the absence of divisional tube artillery, the Honest John was still undergoing tests and was not a perfected weapon yet.

The Battle Group Artillery

In addition to the division’s rocket and tube artillery, the battle group commander was intended to have his own organic artillery support to help him shape the battle. The Pentana Study called this weapon the “mortizer.” It was meant to “combine the best characteristics of the mortar and the howitzer” and be mounted on an artillery version of the same lightly armored carrier as the rest of the battle group. Furthermore, it was also
intended to carry its crew and ammunition. Unfortunately, by December 1955, very little progress had been made in defining the exact requirements for the weapon. In their semiannual report, the artillery developers could only note: “little has been done by CONARC on this project pending the receipt of proposals of an Ordnance Technical Assessment Group.”

Four months later, the proposals had been received and two paths of technological development were recommended. One version of the moritzer was to be a “gun boosted rocket weapon system, approximately 107mm caliber,” while the other version followed the more conventional 110mm howitzer, already designed and developed. Again, the Pentana Study was approved without the requisite equipment either on hand or in the developmental pipeline.

**Mobility**

**Armored Protection**

The concept of moving infantrymen around the battlefield by means other than foot locomotion was certainly not new; mounted riflemen were part of the American army as early as the American Revolution. The automobile and truck were used in World War I to move the masses of infantry to the Line of Departure. Transportation with limited armored protection came with the M3 halftrack carrier in World War II. By the time of the Korean conflict, full armored protection was a part of many divisions, though its primary purpose was not for movement of infantrymen. Assigned to transportation battalions of infantry divisions, the T18 Armored Utility Carrier, a tracked vehicle based on the chassis of the M41 light tank, carried supplies and ammunition as frequently as it
did valuable infantrymen. At the Battle of Pork Chop Hill, April 1953, Major General Arthur G. Trudeau’s 7th Infantry Division used the T18 to great effect. Not only were supplies brought forward for the beleaguered defenders, but also the relief in place of the 31st Infantry Regiment by the 32nd Infantry Regiment took place using the armored carriers. Type-classified by the Army Ordnance Department in 1952, the T18 became the M75 and was the first practical armored infantry carrier the Army produced.

Although it shared many common parts with the M41 “Walker” light tank, it also required many specialized parts that drove its procurement cost beyond the Army’s expectations. The 1951 Tripartite Conference considered the armored infantry vehicle development in addition to its discussions concerning tank developments. The three nations agreed that a vehicle was essential for “transporting personnel and cargo through fire-swept areas and affording sufficient mobility to accompany tanks in the assault; it should provide all-around armor protection (including overhead protection) against small-arms fire, shell fragments, and the effects of conventional type land mines.”

The M75 was in production (as the T18) by the time of the 1951 conference; its replacement was also under development.

The M59 Armored Infantry Carrier was specifically designed by FMC Corporation to carry an infantry squad and its equipment into battle, through any “fire-swept” area. In contemporary articles, it was hailed as an excellent item, “equaling or bettering the performance of vehicles of equal weight and horsepower.” It sported “low engine and track noise,” less noticeable “vibration and noise,” and “very little dust” when compared to the existing M75. These were all valuable points of consideration for the fifties infantryman. Furthermore, it had a “unique” feature, available “at no extra cost” to
the Army: it was amphibious. Contemporary authors waxed enthusiastic on the M59’s capabilities, “picture an armored vehicle weighing several tons nosing down into rivers and lakes, practically disappearing under the water, swimming the water obstacle at credible speed, and emerging on the far side to accomplish its mission.” This was, indeed, a spectacular vehicle!48 The first commander of an armored infantry battalion equipped with the M59, Lt. Col. Howard P. Schaudt, believed it to be “a valuable piece of fighting equipment.”49

The new armored carrier also had a vital role in atomic warfare. Describing a battle under atomic conditions, contemporary authors easily foresaw “movement from the assembly area to arrive at the minimum safe distance from ground zero at H hour.” In defensive operations, armored, and thus protected, infantrymen could “disperse over extended areas” and “quickly concentrate in time and/or space to meet an enemy attack.”50 The 1954 Armor Advisory Panel also believed the M59 was a valuable piece of equipment. Besides recommending investment to product improvements on the vehicle, the Panel essentially approved the model. In retrospect, it is difficult to understand their complacency. By 1954, test after test had revealed the M59 was underpowered, was difficult to maintain, and did not live up to its billing as an amphibian. Yet, the armor experts recommended nothing new; they were satisfied that product improvements would bring “greater reliability and economy in operation.”51 Thus the Panel discarded the opportunity to influence any new development for the infantry of the atomic battlefield. The M59 was expected to serve as the best armored protection for the near future. It went into full production in February 1954.52
Underpowering was a result of the cost savings achieved by using two existing GMC model engines to power the 21-ton carrier. These engines together could not propel the M59 at a speed anywhere near that of the M48 tank; contemporary authors believed its top speed was 30 miles per hour, far behind the tank’s 45 mph. The slow movement of the M59 thus upset the desired balance between tanks and armored infantry; the former outdistanced the latter quickly. Exploiting atomic strikes or moving to reposition against and enemy penetration, a tank and armored infantry team would have quickly lost cohesion and, most likely, the battle.

Communications

One of the great lessons that American officers drew from World War II was that mobility and firepower, in the form of infantry-armor-artillery cooperation, were essential characteristics of modern warfare. Korea reinforced the techniques and tactics for cooperation between tanks and armored personnel carriers, with little opportunity for extensive maneuvering. But the advent of atomic weapons and the attendant threat of nuclear war caused the two concepts to be linked in a powerful new way. Armored firepower and protection became absolutely paramount to capitalize on and avoid the effects of atomic weapons. Yet the benefits of armored firepower and protection were useless if they could not be incorporated into a cohesive whole. Horizontally and vertically among Army organizations, communications systems became the key element to link leaders together.
In the post-World War II era, communications experienced its own revolution that the military both jump-started and co-opted. The transistor was perfected in 1948, but did not become ubiquitous until the mid-fifties because private industry was simply not interested in its development. Once the military services focused their attention on turning the transistor into a useful item, contracts and money flowed, and industry developed the procedures to make the transistor as inexpensive as the vacuum tube. By 1954, success was at hand and the radio industry was quickly adapting to new equipment. Though it essentially started the transistor revolution, the military was not as quick to adapt. Contracts for militarized radio systems let in one month would be out-dated the next; requirements changed almost as fast as new uses for the transistor were created. But the military radios used in the Korean War slowly gave way to better and more capable types.

At the heart of the radio evolution was the reduction in weight, size, and residual heat with a commensurate increase in power and range. The vehicle mounted AN/GRC 3 thru 8 series of radios, the man-packed AN/PRC-8, 9, and 10, and the hand-held AN/PRC-6 the Army used in the Korean War were all vacuum tube based radios. Though better than the equipment from World War II, they were still inadequate for the mobile operations envisioned in the Pentana Study. For instance, the GRC series provided only 350 channels for communication among the armor, artillery, and infantry units, yet an armored division could easily use that many channels by itself. This limitation was a serious impediment to the atomic army concepts of dispersion and swift movements.
Among the other problems was limited frequencies. Certain types of radios that had only a limited frequency band were assigned to certain units. Tank units received the AN/GRC-4 because they allowed communication between platoons in a company and the AN/GRC-3 for communications among companies and the battalion headquarters. Artillery units received the AN/GRC-5 and 6 because of the ranges the radios provided for the artillery batteries, operating behind the forward line of troops. Foot infantry units received the AN/PRC-10, which had a small range and frequency band, but was acceptable for the regimental, combat command, or battle group headquarters. However, these radios were not readily interoperable, and thus a tank platoon could not talk to its supporting infantry unit unless a third radio set was employed because their respective radios operated at different frequency bands. The new series of radios were designed to provide “a broadband set providing the maximum possible number of usable channels” for all users; the interoperability problem would be solved.

The challenge of developing radios that could “talk” to each other turned out to a bit more serious than simply designing the new radios. Military applications of the transistor were only slowly incorporated into design requirements; the original requirements for the new series of radios, the AN/VRC-12 series, were based on vacuum tubes. The Signal Corps Engineering Laboratories (SCEL) at Fort Monmouth followed the transistor development and reported the Purdue Research Foundation’s June 1952 contract for the “application of transistors to radio communications circuits” shortly after it announced the AN/VRC-12 radios. Thus the initial contracts for the new radios did not take advantage of the transistors because they had not yet entered the military procurement system.
Creating the new radio series proved difficult at other levels also. Meant to be used in tanks and armored personnel carriers, the radios had to operate over the noise generated by the vehicles, noise that was considerably higher than their Korean War predecessors. The SCEL joined a cooperative venture with the Quartermaster Corps combat development office in 1953 to integrate better audio protection, earphones, and boom-microphones into the next version of the combat vehicle crewman’s helmet. In addition to the new helmet, the intra-vehicular communication system required modifications to accommodate the increased noise levels. In this case, the SCEL turned to an Air Force system as a prototype replacement. The integration of these systems took time, coordination, and careful planning to ensure their complete integration, in part because the changing requirements for the helmet and updated technology that affected the intra-vehicular communication system. While these two systems were supplementary to the radios and their host vehicles, they added a necessary, if unforeseen, improvement. On the other hand, the incremental improvements to the radio designs proved more challenging.

By 1953, the Signal Corps acquisition office decided to spread the development of the new series of radios among different electronics companies. Portions of the AN/VRC-12 series contracts went to the Bendix Aviation Corporation, Motorola, and the Crosley Division of the Avco Manufacturing Corporation. From 1953 through 1955, the various manufacturers presented design plans, experimental models, and developmental models to SCEL at Fort Monmouth for testing. SCEL performed most of the testing and ensured the different manufacturers met the specified requirements from their
contracts. Given the precision involved in making the radios before and as the transistor arrived, this required significant attention to the manufacturing details.

The AN/PRC-25, the new broadband man-pack radio for infantry battalions, and the AN/PRC-35, the new infantry company radio, presented their own series of challenges. Older technology tubes gave way to new transistors, but not completely. VHF frequencies, still required for operations, were attained through the use of tubes that had to be powered by a different source than the transistors. In the case of the AN/PRC-25, the power source came through converted battery power from integral batteries of the radio itself. For the AN/PRC-35, the VHF requirement was eliminated, but reliance on crystals rather than tubes emerged. Transistors had not reached the developmental stage for use in the small, battery-operated radios yet.

Emerging technology created more challenges for the contracting offices. Much like the invention of the crewman’s helmet, new ideas continued to cause contractual changes. A visit to a Canadian electronics firm in 1954 provided a method to produce a “frequency control system” that would make the new series of radios better; SCEL followed the demonstration and incorporated the idea into the radios. This required a change to the contract that had to be promulgated through at least four electronics companies, two governments, and two military procurement systems, not an insignificant task. In 1955, another new improvement provided a way to filter out ambient noise. Stromberg-Carlson Company received a contract to develop a “self-adjusting squelch circuit” for the new radios. Again, contracts had to be modified and extended to allow the manufactures time to comply with the new changes; fielding schedules slipped further into the fifties.
The tangential, but potentially beneficial, development of the helmet radio also caused a disruption to the production schedule. The radio was designed to provide the individual rifleman with intra-squad communications; it had to be compatible with the new radio system. Signal Corps engineers and technicians, as well as private corporations, devoted significant time and energy to the development of this component of the tactical radio system. Even Lt. Gen. James M. Gavin, as the Army G-3, focused his attention on the radio to ensure its proper incorporation into the developmental program. Though hoped for in 1955, technology did not support it and it was eventually abandoned, but not until much time and energy had been expended on its development and distribution scheme.

More problems unfolded as developments incorporated the transistor technology. As mentioned previously, the man-pack AN/PRC-25 family and the vehicle-mounted AN/VRC-12 and its derivatives, were originally designed around the vacuum tube. The Army eventually appreciated the benefits of the transistor and ended the tube contract in 1955. However, it took from October 1955, when the members of the Front Line Tactical Radio Communications conference decided to abandon tube technology, until May 1956 before the contracts for transistorized versions of the new radios were finalized. This pushed the radio developmental program further towards the end of the decade with the conference’s conclusion that “delay in obtaining service test models is acceptable as long as models are available by January 1959.”

The new series of radios provided the extensions to the communications networks that the Pentana Study required. But they were only one portion of the control equation for the tactical Army; other methods of communications were required to control corps,
field armies, the theater army, and subordinate units at each of those levels. Exercise SAGEBRUSH was a demonstration of this new concept: the grid system for field army communications. This radio system was an improvement over the previous wire and cable system for communications between the different echelons, but presented new problems in itself. The field army system, which operated over a hundred miles from the forward line of troops, presented a significant signature, both as a physical target and an electromagnetic target. The field army main command post and the army support command post each received a new communications system. Each system consisted of ten 26-foot semi-trailers, tractors, generators, mechanics, security personnel, and the communications equipment itself; operators and command post personnel only added to the activity. More trailers and their associated equipments supported the field army tactical command post, corps main command posts, corps tactical command posts, corps support command posts, and the grid communications centers throughout the army area. Thus the field army’s hundred thousand square mile area of operations had significant communications nodes that presented very observable targets for the enemy.

However, the army grid communication system was a significant improvement because it allowed the different echelons of command to stay linked on the new, dispersed and atomic battlefield. The change came from the reduction in the wire and cable linkages that were once required. The new grid system took advantage of radio technology that reached further and could be amplified and pushed onward by radio repeating stations within the grid system. This system benefited ground division operations, but did not work very well for the airborne division. If the division was deployed by air, none of the key components of the grid system could accompany it
during the early stages of an operation. Yet communications with corps headquarters was
critical in an atomic environment to ensure that a link-up between an airborne division
and a maneuvering ground force could be achieved. Without the communications nodes,
the airborne division was an isolated force, requiring significantly more assistance than
any other unit in the field army. The grid system for the airborne division remained an
unsolved challenge as the Army continued with the pentagonal reorganization.70

The Promise of Technology

To summarize, Army staff reports indicated technology held great promise for the
near term army. Improvements in armor protection, ammunition, engine propulsion, and
communications all suggested that future divisions and corps would be able to operate in
an unprecedented manner against any enemy around the world. Given the seemingly
logical and powerful assumption that future warfare would be atomic, all the new
equipment would optimize the tactics of the fifties for dispersion and concentration at
will against an enemy. Field exercises such as SAGE BRUSH seemed to prove the new
tactics. Unfortunately for the pundits on the Army staff, the new technology proved to be
too elusive and ultimately, not useful to commanders and soldiers alike. As is shown in
the next chapter, Army officers and soldiers soon realized the fallacy of the new
prophecies about atomic warfare. The organization that was designed to optimize nuclear
war seemed strangely structured to operate in real life.
1 Gavin, *War and Peace in the Space Age*, 158-59. In his testimony to the DA Ad Hoc Committee to the Council of Deputies for Presentation to the CSA, subj.: “Pentana Army” in April, 1956, Gavin indicated that all planning should be based on atomic weapon use with the weapons integrated into everything the Army did.


5 The most recent history of U.S. armor development is George F. Hofmann and Donn A. Starry, eds., *From Camp Knox to Desert Storm* (Lexington, KY: The University Press of Kentucky, 1999). Others include the technical series of books by R. P. Hunnicutt.

or Just Getting By? Armor Combat Development and Acquisition, 1945-1980,”

presentation by Robert Cameron, Command Historian, U.S. Army Armor Center, Fort Knox, KY at the Conference of Army Historians, 6-8 August 2002, Washington, D.C.

7 Ogorkiewicz, 42-43, details the British developments.


9 Final Report of Tripartite Conference on Armor, Part 1, Section II, 1, Patton Museum of Cavalry and Armor, Fort Knox, KY.

10 Major General Doan was the commander of 2d Armored Division when the Panel convened. Howze, Westmoreland, Polk, and Abrams all went on to greater fame in the sixties and seventies, eventually retiring as full generals. Colonel Welborn Dolvin had secured fame during the Korean War. Other members of the panel included Brigadier Vonna Burger, who eventually commanded 1st Armored Division, and Colonel Walter Richardson.

11 Final Report of the U.S. Army Armor Advisory Conference, Section IV, 1-6, Patton Museum of Cavalry and Armor, Fort Knox, KY.

12 Ibid, Section VI, 2-3.

13 Semiannual Report of Combat Developments for CONARC Summary, 1 July 1955 – 31 December 1955, Vehicle and Armor Division, Development and Test Section, 1, USAMHI, Carlisle, PA.

14 Hunnicutt, 102-114.
15 Final Report of the U.S. Army Armor Advisory Conference, Section VI, 7, Patton Museum of Cavalry and Armor, Fort Knox, KY.


17 Final Report of the U.S. Army Armor Advisory Conference, Section VI, 15-16, Patton Museum of Cavalry and Armor, Fort Knox, KY.

18 The T43 was fielded to one active Army unit, the 2nd Heavy Tank Battalion, 33rd Armor Regiment. The heavy tank battalion was abolished in July 1955 because the concept of a single, large caliber tank serving as a designated anti-tank unit became obsolete as better tank cannons and ammunition came into the inventory. See also “Elimination of the Heavy-Gun Tank Battalion,” *Armor*, 64, no. 6 (November-December, 1955), 46 and Semiannual Report of Combat Developments for CONARC Summary, 1 July 1955-31 December 1955, Vehicle and Armor Division, Development and Test Section, 2, USAMHI, Carlisle, PA.

19 Hunnicutt, *Patton*, 123-124; Ogorkiewicz gives a short explanation of the various initiatives in the fifties with armor improvements, 81-84, and engine improvements, 88-89.

20 USACGSC, RB 101-150 *Organization and Mobility – The Pentomic Army*, Section III, Future Trends, 52, USAMHI, Carlisle, PA.


22 Ibid, 7.

24 Ibid, 17-18; see also Charles M. Jaco, Jr., “Deliberations Concerning Platoon Antitank-Rocket Problem,” (Huntsville, AL: Redstone Arsenal, U.S. Ordnance Missile Laboratories, 1953) for another view of the value of each of the above described systems.


26 Ibid, 54-57.

27 Ibid, 64.

28 Ibid, 68.

29 Ibid, 86-90.


32 Ibid, 29.

33 Ibid, 31-32.

34 Ibid, 46-47.


Ibid, 144-147.

Ibid, 148-149.

Ibid, 159-165. Four battalions were located at Fort Sill, OK, three at Fort Bragg, NC, and one at Fort Bliss, TX.


Semiannual Report of Combat Developments for CONARC Summary, 1 July 1955-31 December 1955, Field Artillery, Rockets, and Atomic Division, Development and Test Section, 5, USAMHI, Carlisle, PA.


Cobra” and maintained that such a vehicle was easily produced by American industry. Perhaps just ahead of its time, the study presaged the development of the M113 APC.


47 Final Report of the U. S. Army Armor Advisory Conference, Section VI, 19, Patton Museum of Cavalry and Armor, Fort Knox, KY. Another interesting note from the Conference was the US agreement to develop tracked vehicles and, if tracked proved to be impractical, wheeled vehicles. The UK focused only on wheeled vehicles.

48 Flint and Tixier, 7.

49 Howard P. Schaudt, “Sum and Substance,” Armor, 63, no. 4 (July-August 1954), 21. Schaudt commanded the 701st Armored Infantry Battalion, 1st Armored Division, Fort Hood, Texas during Exercise SPEARHEAD, previously described in Chapter 2.

50 Ibid, 9.

51 Schaudt, 20-21; Foss, 306; Final Report of the U. S. Army Armor Advisory Conference, Section VI, 20, Patton Museum of Cavalry and Armor, Fort Knox, KY.

52 Foss, 306.

53 Hunnicutt, Bradley, 53; Haworth, 27.
Dr. Hans K. Ziegler, “Thirty Years of Electronics Research and Development in USA: Methods, Results, Lessons Learned,” lecture given at Siemens A. G., Munich, Germany, 5 October 1976, 15-18, U.S. Army Communications and Electronics Command, Signal Corps Archives, Fort Monmouth, NJ.

Department of the Army Technical Manuals 11-284, Radios Sets AN/GRC-3, -4, -5, -6, -7, and –8, November 1950; TM 11-296, Radio Set AN/PRC-6, October 1951; TM 11-612, Radio Sets AN/PRC-8, -9, and –10, September 1951 (Washington, DC: USGPO) for radio characteristics.

Signal Corps Engineering Laboratories (Hereafter cited as SCEL) Journal, 7, no. 12 (20 March 1952), 1-2, Signal Corps Archives, Fort Monmouth, NJ.

SCEL Journal, 7, no. 24 (12 June 1952), 1, Signal Corps Archives, Fort Monmouth, NJ.

SCEL Journal, S-1, no. 16 (9 April 1953), 5, Signal Corps Archives, Fort Monmouth, NJ; Combat Developments Command Semiannual Report for CONARC Summary, 1 July 1955-31 December 1955, Light Weapons, Individual Equipment, Chemical and Biological Warfare, and Tripartite Standardization Division, Development and Test Section, 3, USAMHi, Carlisle, PA. The combat vehicle crewman’s helmet combined ballistic protection with communication devices to facilitate operations of the vehicle itself and the interoperability of the vehicle with others.

SCEL Journal, S-1, no. 24 (4 June 1953), 3-4, Signal Corps Archives, Fort Monmouth, NJ.
60 SCEL Journal, S-1, no. 22 (21 May 1953), 5; SCEL Journal, S-1, no. 40 (1 October 1953), 5; SCEL Journal, S-2, no. 5 (11 February 1954), 6; SCEL Journal, S-2, no. 17 (6 May 1954), 7; SCEL R&D Summary, 1, no. 2 (15 July 1954), 7; SCEL R&D Summary, 2, no. 6 (17 February 1955), 5, all Signal Corps Archives, Fort Monmouth, NJ.
61 SCEL R&D Summary, 2, no. 41 (25 November 1955), 2-3, Signal Corps Archives, Fort Monmouth, NJ.
63 SCEL Journal, S-2, no. 5 (11 February 1954), 6, Signal Corps Archives, Fort Monmouth, NJ.
64 SCEL R&D Summary, 2, no. 7 (24 February 1955), 4, Signal Corps Archives, Fort Monmouth, NJ.
65 SCEL R&D Summary, 2, no. 28 (21 July 1955), 7, Signal Corps Archives, Fort Monmouth, NJ.
66 Curtis, 25.
67 Annual Historical Summary, FY 63, Office of the Project Manager, AN/VRC-12 and PRC-25 Series Radios, U. S. Army Signal Corps Engineering Laboratories, Fort Monmouth, NJ, 2, 10, Signal Corps Archives, Fort Monmouth, NJ.
68 Combat Developments Command, Semiannual Report for CONARC Summary, 1 July 1955-31 December 1955, Communications and Electronics Division, Development and Test Section, 2, USAMHI, Carlisle, PA
69 SCEL R&D Summary, 2, no. 33 (25 August 1955), 1-2, Signal Corps Archives, Fort Monmouth, NJ.

CHAPTER 5

THE PENTANA STUDY IN PRACTICE: REORGANIZING THE ARMY

Significant challenges came with General Taylor’s decision in May 1956 to reorganize the Army in line with the Pentana Study. How soon could the defense industry produce the new equipment? How would existing equipment be redistributed? How would the personnel system adjust its procedures to match the requirements of the five battle group division? Though Taylor’s decision had an immediate effect on the assembled general officers in May 1956, its real impact, and the reverberations of it, would require more time to be felt throughout the Army. The resultant “Pentomic Army” would prove to be one of the most controversial organizations in the history of the American armed forces.

Taylor’s guidance to implement the Pentana Study was published to the Army officially in June. He wanted the study to serve as a tool for “organizational, operational, and research and development planning.” The Chief of Staff’s vision was a single organizational structure for all divisions; Pentana was the method to get the Army there. To that end, he tasked CONARC to develop a plan for the Army to transition from current organizational structures to the new Pentana organizations. Taylor emphasized
that he wanted this transition plan quickly and CONARC was to account for the lessons observed from the ATFA studies and other on-going organizational efforts. But the Chief also directed that Wyman’s command maintain an open mind: “In all of the areas under consideration, care must be taken to avoid giving the impression that the concepts under study are fixed or final conclusions which are not subject to further revision.”

In addition to developing a transition plan, Taylor also required CONARC to assess several issues related to the Pentana Study. The single division structure desired by Taylor needed to be weighed against the requirement for operating with or without atomic weapons. The Chief also questioned the need for mechanization. The Pentana Study’s division was mechanized, but Taylor believed this could not only be too expensive, it would create a division ill equipped to operate against guerrilla forces or perform rear area duties. The Chief of Staff also wanted engineers back in the division and believed that a divisional tank unit retained a role until new equipment was available to make the consolidation of tanks at corps level acceptable. Lastly, the division artillery fire coordination capability was too limited; Taylor wanted further study to determine if some reshuffling would solve the problem. He wanted a closer link between division and corps artillery to provide more artillery from corps assets when needed instead of depending solely on the Honest John missile as the only long-range division weapon.

CONARC returned to its study group method to reassess the Pentana organizations and develop a transition plan. What eventually evolved was the Transitional Atomic-Non-Atomic Plan, dubbed Transana, for implementing the pentagonal organizations across the Army. The Transana Plan retained the current separation between the infantry, airborne, and armored divisions until sufficient
equipment was available, testing and experimentation had been conducted, and requirements assessed to permit a single, common division structure. CONARC proposed this major reorganization of the Army for 1959 because “this [was] the earliest date at which major items of new material would begin to become available.”\textsuperscript{3} Taylor, unimpressed with the cautious approach suggested by the Transana Plan, did not want to wait years for the change and directed that the infantry and armored divisions begin reorganization immediately. On-hand equipment was used to make the changes now; new equipment would follow. The Chief of Staff was bolstered in his direction after he had capitalized on restationing efforts to implement the pentagonal organization with his old unit, the 101\textsuperscript{st} Infantry Division (Airborne).\textsuperscript{4}

The reorganization of the airborne division represents a branch of the Pentana Study whose implementation was fortuitous. The airborne divisions of World War II had been the darling units of Eisenhower, Bradley, and Montgomery. Although the U.S. ended the war with a corps headquarters and five divisions that were airborne capable, by 1955, only the corps headquarters and two divisions remained.\textsuperscript{5} Moreover, the 1955 airborne division was no longer the specialized unit of World War II, but rather a weaker version of the standard infantry division, too heavy to perform its assigned missions of swift movement by air, operations behind enemy lines, and deep raids. When the opportunity presented itself in 1955 to return another division to active status, an airborne division was a logical choice, especially since it was the 101\textsuperscript{st}. Not only was the division inexpensive to activate and maintain, but also its battle honors, public recognition, and the emotional connection with Taylor and other veterans made it a logical choice.
The recommendation from the Army staff was to recreate the division along lines that would become more familiar in 1956: five airborne combat groups, based on four infantry companies, with additions of “a 105mm mortar battery, a 15-inch rocket platoon of four launchers, a reconnaissance platoon, a medical clearing platoon, and an engineer pioneer platoon,” all commanded by a colonel. A division support group would provide vehicle, equipment, and parachute maintenance as well as supply, transport, and medical facilities. There would be a division artillery battalion of five 105mm mortar batteries and three Honest John Junior rocket batteries. A signal company, an engineer battalion, and a command and control battalion rounded out the proposed division. The essential element of the proposal was the battle group, which consisted of just fewer than 1600 paratroopers; the division as a whole was 11,240 soldiers. All five battle groups and necessary elements of division support could be lifted with just over 400 sorties, a significant reduction from the 620 sorties needed for just the assault elements of the current 17,000-man, three-regiment division organization. Even after the 620-plus sorties were finished, all of the heavy equipment now present in the division structure had to be moved and, of that, some could not go by air even with the largest transport planes available. The proposed division was lighter in equipment and manpower, and yet had almost as much firepower as the current divisions. Perhaps equally important, the airborne division returned to the special status it had enjoyed during World War II: it was capable of rapid movement by air, could readily deploy self-contained elements of the division, and could sustain itself in combat until relieved by regular ground units.

The Army G3 proposals for the organization went to Fort Leavenworth in June 1955 for CGSC’s review and comment. Within a month of receipt, CGSC’s
Commandant, Major General Garrison Davidson, responded that the proposal was “very interesting.” He cited the on-going ATFA studies and the “more recent study prepared by CONARC” [the Pentana Study] to indicate that the organizational changes were not yet proven or tested. Davidson cautioned Major General Paul D. Adams, then the Army G3 and the proposal’s director, that the new organizational studies required “analytical study and test. Within this area, further study is necessary . . . as to whether the size of the battle group will permit the occupation of sufficient area to permit aerial resupply, etc.” Davidson also warned against the small signal company; ATFA had already proved it inadequate to the dispersed tactics inherent in atomic (and thus airborne) tactics.

CGSC also made several other recommendations: the 90-mm anti-tank recoilless rifle should be dropped in favor of the DART anti-tank missile; the division artillery organization was inadequate to provide fire direction and control for the missiles; all division aircraft should be consolidated in the division aviation company vice being spread between that company and the divisional reconnaissance company; the engineer battalion be better equipped to perform airfield repair and maintenance; and the support group not be implemented because of its failure in the ATFA-1 study.

By November 1955, after the Army G3 had refined their work and passed it to CONARC, the Army service schools were given a two-week period to assess the proposed organization and make recommendations back to CONARC. The refined G3 proposal included several of the changes that Davidson had recommended: the signal company was expanded to make it a battalion, the engineer battalion received greater airstrip construction capability, the DART was accepted as the final anti-tank weapon, though the 106mm recoilless rifle was authorized as an interim measure, and the missiles
were removed from the battle groups and concentrated in the division artillery. The basic element of the proposal, that five battle groups formed the fighting portion of the division, remained unchanged. The proposal returned the airborne division to its special status, including the ability to deploy only portions of the division. In fact, the proposal indicated that the division would rarely be used as a whole division. Rather, the unit would deploy its five battle groups, each a semi-independent and self-contained unit, to decisive points on a future battlefield where they would accomplish their objective and eventually link-up with an approaching ground unit.

The pentagonal nature of the airborne division was important because it facilitated the independent operation of the battle groups. However, the G-3’s proposed division strength was now 11,486, far greater than the 8,700 proposed for the Pentana Study’s division. The special nature of the airborne division, truly designed to operate as battle groups rather than a division, was the reason behind the increased strength. Whereas the Pentana Study’s division could look to its parent corps and army organization for artillery, tanks, and other support, the new 101st – type pentomic airborne division was an independent army group or theater asset, designed as a base for the battle groups to be dispatched from. Thus the battle groups had to have sufficient manpower and equipment to survive until ground link-up was made.

The service schools found no significant shortcomings with the proposals and work continued to create the detailed tables of organization and equipment. By February 1956, Taylor was sufficiently convinced of the effectiveness of the airborne division reorganization and approved it. The final organization retained the high manning authorization, but changed the structure in two significant ways. A fifth company was
added to each infantry battalion and howitzers replaced the 105mm mortars in the division artillery batteries. These changes allowed the battle group to operate as a pentagonal organization, with five companies, while each of the five battle groups could receive attachment of a howitzer battery, a better weapon with greater range than the mortar.

CONARC’s Combat Operations Research Group conducted a study from January through June 1956 to evaluate the new airborne division and produced results consistent with expectations: the reorganized division was better than the current division structure. The study showed that the new division total strength was 35 percent less than the current division, while the company and platoon strengths were increased by 11 and 34 percent, respectively. The new division had greater atomic firepower in the form of the Little John nuclear-tipped missiles, but was weaker in conventional artillery due to the loss of the 155mm howitzer battery. The old and the new airborne divisions were deemed to be equally vulnerable to atomic weapons effects. However, through rather curious logic, the new division was less susceptible to atomic attack than the current division because it was not expected to be in continuous combat. According to the study, the logistical tail of the new division was 12 percent less than the current division, though again that was based on the new munitions and the self-contained Little John firing units.

Perhaps the greatest success that emerged from the study of the new division was the airlift requirements assessment. The new division could bring 90 percent of its assault echelon and 82 percent of its equipment in 670 lifts, while the same number of lifts brought only 73 percent and 20 percent of men and equipment for the current division. Furthermore, what the new division was able to bring to bear with these lifts...
was far greater than what the current division could bring; the battle groups were capable of fighting and sustaining themselves in combat for several days while the current division’s regiments were unable to do so.\textsuperscript{15} The CORG study concluded with the recommendation that the forthcoming field tests assess “the effects of lack of organic anti-aircraft fire support, effects of lack of reliable non-atomic field artillery fire support beyond 9,000 yards, and . . . the feasibility of increasing the number of fire units of artillery” available within the division. It also recommended developmental emphasis on the optimum fragmentation munitions, the Honest John Junior (now called the Little John) missile, transport vehicles, and communications sets.\textsuperscript{16}

The tests for the airborne infantry division were designated Exercise JUMP LIGHT, scheduled for October 1956 through February 1957. The 101\textsuperscript{st} Division, commanded by Major General Thomas L. Sherburne, performed superbly during the test, though the highest echelon assessed was the combat group. The new organization seemed to prove itself, though it was in no small measure due to the quality of leadership assigned to the division upon its activation.\textsuperscript{17} Perhaps the sense of accomplishment that the airborne troopers and commanders felt as a result of JUMP LIGHT gave moral support to Taylor in his belief that the pentomic structure was an excellent decision. Perhaps he believed that the Pentana battle group commanders would work to resolve issues and shortcomings, as they had in the 101\textsuperscript{st}. Regardless, the success of the 101\textsuperscript{st} Division’s battle groups only reinforced the organizational path upon which the Army was moving.

In retrospect, the more important parts of the pentomic airborne division were its timing and the personalities involved. Timing was significant because of the ongoing
division reorganization efforts; Taylor was facing an uphill battle for acceptance of the
Pentana Study among his senior leaders in early 1956. The airborne division
reorganization occurred just as the Pentana Study received its review and Taylor decided
to adopt the Study wholesale. The fact the airborne division successfully made the
transition had to bolster Taylor’s views as well as quiet the dissenters. The major
personalities involved were also significant. Major General Adams supervised the
original preparation of the new airborne proposal; he was an advocate for returning the
airborne division to its special niche in the Army, having served in 1st Special Service
Force during World War II and commanded the 101st Division when it was a training
division at Fort Jackson, South Carolina in 1952-53. He was convinced “that a
requirement will continue to exist for sometime in the future for an airborne division
specifically organized and equipped to perform missions in a true airborne role.” 18
Adams had been involved in all of the discussions regarding the ATFA organizations and
was intimately familiar with the various reorganization proposals. Perhaps equally
important, Adams had served under Taylor and his assignment as XVIII Airborne Corps
commander in August 1955 indicates that he stood high in the Chief of Staff’s estimation.
The division commander, Sherburne, was an airborne supporter, having commanded the
division artillery of both the 82nd and 101st divisions; he was also Adams’ West Point
classmate. Of the five battle group commanders, four rotated to the division from the
Army staff.

Adams acceptance of the five-unit division, the design of the battle groups, and
the restructured division support organization was significant. The Army Staff’s G-3
office seemed to accept the ideas associated with any pentagonal organization, while the
institutional Army service schools, such as the branch schools and CGSC, did not buy in to the concepts as readily. As will be seen, the perspective on the pentagonal organizations depended on where an officer worked and how well he bought into the concept of change. Many on the Army staff and CONARC seemed to accept the new organization as a savior of the Army’s missions. The new organizations fit in to Taylor’s vision of the future army: they would be lighter, more powerful, and more mobile than the current organizations. The institutional trainers were far more skeptical and accepted the pentagonal structure reluctantly. The units that experimented with the new organization soon realized something was seriously wrong, but that opinion took some time to work its way to the upper ranks.

Just as the airborne divisions were undergoing reorganization in 1956-57, the armored and infantry divisions were also converting to the new pentagonal – dubbed “pentomic” by Taylor – structure. For the armored divisions this represented a less traumatic change than the infantry divisions. As had been demonstrated by the 1st Armored Division in Exercises BLUE BOLT and SAGE BRUSH, the combat commands were very effective organizations. By 1957, when the name was changed to battle groups, the armored division had to make very few other changes. This is not to say that major changes did not occur; contemporary authors pointed out that the division organization represented a departure from its current structure.19 The tank and armored infantry battalions added a 4.2-inch mortar platoon and a medical section to the headquarters company, but changed the tank and armored infantry companies in detail only.20 Division artillery received a fourth battalion with two batteries of 155mm howitzers and a battery each of nuclear-capable 8-inch howitzer and the Honest John
This fourth battalion was in addition to the three traditional 105mm self-propelled howitzer battalions and gave the division commander a very powerful unit to respond to enemy actions. Divisional battalions also changed as the engineer battalion received greater river crossing capability and the armored cavalry battalion was authorized greater surveillance capability. The major element of the support command that underwent reorganization was the ordnance battalion. It now focused its support to the combat commands on vehicle and tank armament support, while consolidating more technical and time-consuming maintenance functions at the battalion level.

The armored division represented a challenge to the CONARC planners. Since the Pentana Study consolidated tanks at the corps level, the armored division would cease to exist as the pentomic army matured. However, until the necessary equipment was procured and distributed, the armored division stayed on the rolls. Therefore, the challenge was how to make the changes to the division base that would remain after the tanks were eliminated. CONARC’s solution, outlined above, reflected this approach. The three combat commands become battle groups but did grow to five, while the remainder of the division became fully pentomic. Even with the changes discussed, the new armored division had a minimal increase in strength, from 13,971 to 14,617.

The reorganization of infantry divisions was more drastic. Manpower shrank from 17,460 to 13,748 soldiers, nearly a twenty percent decrease in manpower, with the largest reductions in the infantry regiment and battalion overhead and in the division artillery group. The pentomic organization reallocated some of the regimental assets, such as elements of the service company and the heavy mortar company, down to the battle groups and up to the division’s separate battalions. Other units, such as the
infantry battalion’s heavy weapons company, the regiment’s assigned tank company and
the division’s anti-aircraft artillery battalion, were simply eliminated.25 Whereas the
current infantry division had nine infantry battalions under the three infantry regiments,
the pentomic division had five battle groups. Reducing the command and control
headquarters from twelve to five led to a loss of nearly 1000 soldiers from the
headquarters of the regiments and battalions. A review of the TO&Es show a decrease
from twenty-seven infantry companies to twenty, but a decrease of only one platoon from
old to new, from 81 to 80. The new pentomic platoon increased its firepower by adding
more automatic riflemen and doubling the number of 3.5-inch rockets (bazookas)
available to the platoons. The weapons platoon of the new rifle companies decreased
from twenty-seven to twenty also, but increased their firepower by replacing the 57mm
recoilless rifle and the 60mm mortar with the 106mm recoilless rifle and the 81-mm
mortar, the latter weapons pushed down from the former battalion heavy weapons
company.26 While the number of companies decreased overall, the number of riflemen
decreased minimally while the quantity of firepower increased significantly.

The new pentomic division reduced its artillery component from 2683 personnel
in four artillery battalions to 1763 personnel in six battalions. While the standard TO&E
called for three battalions of 105mm howitzers and one of 155mm howitzers, the
pentomic artillery had five battalions of 105mm howitzers and a composite battalion of
155mm howitzers, 8-inch guns, and Honest John missiles.27 The 105mm battalions
reduced from eighteen guns each to six guns each. This provided a battalion for each of
the battle groups in the same way that a battalion was previously provided to each
regiment; more tubes were actually available to each battle group than before. In
addition, the greater range and firepower of the 8-inch guns and the Honest John missiles increased the division commander’s ability to assist the battle groups. Other reductions occurred in the artillery fire coordination center and the service batteries of the artillery battalions.\textsuperscript{28}

The infantry division reorganization was a significant cultural change for many officers and soldiers who had developed under the triangular system. The organization of the combat commands or battle groups and the dependence on a support command to provide essential supplies were theoretical under ATFA; arguments associated with those ideas were also theoretical. When Taylor ordered the implementation of the Pentana Study, theory became reality and the changes permanent; lifestyles and cultures had to change. This called for a considerable re-education of Army personnel at all levels and with many different means. Official Army publications heralded the new organization as essential for survival in the world of atomic war.\textsuperscript{29} The Infantry School at Fort Benning, the Armor School at Fort Knox, and Fort Leavenworth’s CGSC changed their curricula to reflect the new organization.\textsuperscript{30} A panel of experts assembled at the Annual Army Training Conference on Atomic Warfare reviewed each of the combat branches school’s programs of instruction to verify compliance and adequacy of training. All POIs were noted as covering the topic adequately, though the nuclear subject was taught as a survey only. Essentially, the panel experts were satisfied with what they saw.\textsuperscript{31} Branch and service magazines such as \textit{Armor, Combat Forces Journal, Military Review,} and \textit{Army Information Digest} advertised books that touted the new organizations. The pentomic structure was going to be the new organization; the sooner everyone involved accepted that, the better the Army would be. By December 1956, all of the new Tables of
Organization and Equipment had been created and approved; the Army was moving in its new direction.

Taylor was actively involved in this re-education process. At a meeting of the service school commandants in early February 1957, he explained why the organizational changes had been made and how the new divisions would perform assigned Army missions better. The Chief of Staff heralded the necessity to fight in two kinds of wars: an all-out general war and a limited war. He declared that the pentomic organization was the best possible way to structure the Army to meet the dual threats in war, while preserving, and potentially increasing, the number of active divisions. Perhaps cognizant of the service school commandants’ reluctant acceptance of the pentagonal organization, Taylor ensured the Army staff was well prepared to sell them.

The Deputy G-2 for Intelligence briefed the audience on the Soviet Army and the offensive nature of their doctrine. He carefully described their offensive tactics and provided commentary from Marshal Georgi Zhukov’s address to the Soviet Party Congress on the use of nuclear weapons. From an intelligence point of view, the Soviets were already prepared to wage nuclear war to secure Europe and the U.S. and its NATO Allies were not.32 Lt. Gen. James M. Gavin, now serving as the Chief of Research and Development in the Army G-3, also gave a presentation that highlighted the new material the Army would shortly produce. He carefully laid out the future battlefield and how the new missiles, aircraft, and ground equipment would solve the Army’s problems in fighting the Soviets for control of the world. His message was unchanged from his time as VII Corps commander in Germany: dispersion, mobility, and communications were the key to survival and success on the future battlefields. Gavin’s presentation covered
the grid system of communications, tank and armored carrier developments, aircraft advances, and missiles. Unfortunately, he described everything the new TO&Es authorized, but offered no timeline of when the new equipment would be fielded except soon.  

Despite the enthusiasm of Taylor and the Army staff, there are strong indications that the conference elicited only grudging support from the audience. As described in Chapter Three, most commandants did not believe that the pentagonal organizations were effective fighting units. For parochial reasons, and undoubtedly personal reasons also, each of the branch school commandants must have voiced their concerns about the new organization. While the commentary was not recorded, evidence indicates that the school commandants were essentially ordered to support the pentomic organization and adopt a positive attitude; that directive worked its way down to the service school staffs. A senior Infantry colonel, recently arrived at Fort Benning from his regimental command and other duties in Korea, voiced his distinct dislike for the pentomic ideas then being included in Infantry School instruction. It was not long before he was summoned to the School Commandant’s office and told to swallow his dislike, get on the bandwagon, and support the new organization. He noted many years later: “I then prostituted myself and became one of the strongest advocates of the organization for as long as I was assigned to the Infantry School.”

Another example of the directive and “top-down” nature of the pentomic reorganization came in a letter to the commanders of the U.S. Army, Pacific and the Continental Armies. CONARC Commander Wyman informed the lower commanders that the new infantry division organization be “considered . . . an adequate and effective
combat organization for employment in warfare of the future.” The letter sought evaluations of the division through normal processes, as “no formal testing of the . . . organization is indicated.” Routine training exercises after the reorganization was complete would serve as means to assess the reorganized units. Once information was gathered and reviewed, it was to be sent to CONARC headquarters for further evaluation, yet all of the assessment was to be completed by January 1958. No changes to the December 1956 TO&Es were authorized and no commentary on the substitute equipment was to be added. 

Viewed from a different perspective, Army units in the Pacific and in the U.S. were to accept the new structure without question, a far cry from Taylor’s original instruction to Wyman in June 1956 to not view the pentomic structure as fixed. The only opportunity to comment on it would be after field exercises tested it. The comments had to be supported by proper justifications and senior commanders’ evaluations. All reorganizing and training was to be completed over the next nine months. This was indeed a tall order for units in the Pacific, especially those stationed in Korea, and the continental U.S. divisions. Planning for exercises, let alone the maneuver rights that needed to be secured for overseas and continental U.S. maneuvers, had to be swift and rigorous to accomplish the goals. It is doubtful anything close to rigor was applied to division exercises, if any exercises occurred at all.

Changes were made and the new organization evolved, but the form was less than desired. In the 25th Infantry Division, stationed in Hawaii since 1954, the pentomic reorganization consisted of little more than reflagging the regiments to battle groups, in part because the new equipment was not there. It was a cosmetic and superficial change,
and one suspects done with no little cynicism. Though redesignation took place, other units were also slow to change. The armored divisions in Europe and the U.S. retained their combat command structure as required and adapted their separate battalion-sized units to put them in line with the pentagonal concept; they also waited for the newly authorized equipment. In Korea, the 1st Cavalry Division, then organized as a hybrid infantry-armored division, did not make any organizational changes of battalions and simply regrouped them under battle group headquarters.37 The 8th and 24th Infantry Divisions in Europe each retained two infantry regiments but gained an airborne battle group. While these issues and others remained, the Army as a whole reported its reorganization complete by the middle of 1958.38

Yet 1957 turned out to be a very difficult year for the Army and one in which the pentagonal plans for divisions, corps, and army organizations took more than their fair share of decrement in the Army priorities. A reduction in manning authorizations forced Taylor to reduce the Army by 100,000, eventually forcing the furling of five division flags, leaving fifteen active divisions.39 The turmoil associated with restationing the remaining divisions was an administrative nightmare, one that a TO&E change to the pentomic division further exacerbated. Certainly some of the turmoil of restructuring, simultaneous with unit deactivations, led to a dim view of the new organization, which appeared related to the manpower reduction instead of the result of a long-term process. Officers and soldiers eventually settled into their bases – and received the correct division shoulder patch – but the effect of change was difficult to manage.

One of the most traumatic, and controversial, aspects of the pentomic reorganization was the replacement of the regimental organization with the battle group.
For decades, the regiment – and the social unit, the “regimental family” – had been the organization that soldiers had identified with and given their loyalty to. Some regiments claimed battle honors back to the early 19th century and regimental identification had been crucial in recruiting, discipline, and morale. Taylor was well aware of, if less than sympathetic to, the Army’s emotional attachment to the regiment. He arranged for Deputy Chief of Staff for Personnel, Major General Donald P. Booth, to address the issue at the February 1957 Service School Commandants Conference. Describing Taylor’s task to the personnel office to develop recommendations for “a judicious modernization of Army symbolism” and “to eliminate obsolete and antiquated Army terminology,” Booth summarized the Chief’s guidance as a perception that the Army had “unnecessarily shackled itself to obsolescence, in the public mind, by letting our appearance and our language fall behind our developments in material, organization, tactics, and capabilities.”

Booth proposed the redesign of artillery branch insignia; the redesignation of field and coastal artillery units to simply artillery; the return to historic designation of cavalry units as troops and squadrons rather than companies and battalions; and the implementation of the Combat Arms Regimental System (CARS). The latter system designated a parent regiment for separate battalions and battle groups. Thus the historic regimental designation of the 1st Infantry or 1st Cavalry Regiment was retained, but the separate battle groups, battalions, or squadrons of the parent regiment served in several different divisions simultaneously.

The use of CARS certainly aided the personnel managers of the Army. They retained the designations of famous units, but assigned them to several different locations. Thus the famous 1st Infantry Regiment had its 1st Battle Group assigned to the
1st Infantry Division and its 2nd Battle Group to the 3rd Infantry Division. This was a manager’s godsend; soldiers who desired regimental affiliation were easily served by moving them from station to station. But, from a career point of view, gone were the days when non-commissioned officers and officers could structure their careers to stay within the same organization. Indeed, now a soldier could conceivably spend his entire field service in the 1st Infantry Regiment without serving in the same division, or even the same battle group. A certain amount of resentment existed and longing for the former regimental organizations died hard; a measure of distaste for the new organization remained.

Absent from Taylor’s February 1957 Conference was any mention of either the material development progress or the logistical reorganization, both essential elements of the pentomic reorganization. Gavin mentioned the new equipment, but gave no timeline for its arrival. These two omissions were significant for their lack of emphasis during a conference that was designed to “sell” the new ideas to the generals who had to develop the training requirements for field units. Training exercises such as SAGE BRUSH or JUMP LIGHT were experiments to determine how well the new organizations worked, yet there was no official discussion recorded or training basis established to assess them. It seemed as if the CONARC Combat Developments Office shouldered the assessment requirement for themselves and left division and army commanders to their own judgments for exercising the pentomic units.

The material requirements for the pentomic division – identified in 1954 and 1955 as essential for the proper implementation of the organization – soon came into focus, though not in a structured manner. The one office that was chartered to coordinate the
development of new material, CONARC’s Combat Developments Office, struggled to coordinate all of the Army’s efforts in this area.\textsuperscript{42} The best that it could do was to consolidate the recommendations of its various Testing Boards, prioritize the needs, and pass them forward to the Army Staff for allocation of resources. This effort was disjointed and uneconomical in its execution.

Board #2, stationed at the Armor Center at Fort Knox, is an example of how CONARC delegated its combat developments efforts to the service branches. Armored vehicle evolution after the Pentana implementation was driven by the policy needs of the biannual Tripartite Conferences rather than actual material development. The Army’s Armor Policy Conference, held at Fort Knox in March 1957 in preparation for that year’s Tripartite Conference, focused more on minimizing the effects of atomic blasts and the resultant radiation than on other design improvements. Unlike the 1951 Armor Policy Conference, there was little discussion of vehicle design, main armament, and engine developments. Rather, almost all of the conference focused on atomic weapons and how the Armor community could minimize its effects through organization and better vehicles. The reorganization of the current armored division was discussed as one effort to minimize the exposure of armored formations to atomic blasts. Equipment was mentioned not as advances in technology to enhance the ability of the division commander to accomplish his mission, but rather as an advance to avoid the effects of atomic weapons. Even when the conference members addressed new testing, it focused on how best to protect atomic launch areas with armored vehicles, since a launch area would be the object of an enemy’s attack.\textsuperscript{43}
In its summary, the conference made seven recommendations to be carried forward to the 1957 Tripartite Conference; all but one related to minimizing atomic effects. The six atomic-related recommendations dealt with reducing blast effects, radiation shielding, the effects of “temporary or permanent impairment of vision that can be induced by the thermal effects of a nuclear explosion,” and the potential “application of remote controlled vehicles for exploitation of atomic strikes.” The only recommendation that did not address atomic weapons was the one that should have caused the greatest concern for the armor force: to “continue the development of current tank designs based on [their] vulnerability to conventional weapons.” In essence, this meant that the current M41 and M48A2 tanks would continue in service and that no new light or medium tank design was forthcoming. Thus armor officers were left with the unpleasant reality that their future tanks would be little more than improved versions of their current inadequate tanks.44

The Armor Policy Conference also touched on several other subjects that were key to the pentomic organizations: armored infantry carriers and communications. In both cases, the conference members indicated their belief in the effectiveness of current improvements and recommended maintaining the status quo. That meant that the M59 armored personnel carrier was continued in production, though a new version of the vehicle was being tested. The conferees made no mention of the new carrier. Designated as the T113, it was based on welded aluminum plates rather than the M59’s steel plates, providing a lighter, faster, and less expensive alternative to the current carrier. The new AN/VRC-12 series of radios also continued at their slow pace, with the Signal Corps Engineering Laboratories noting that developmental models were due from the
contractors to SCEL by mid-FY58 for full availability by FY60.\textsuperscript{45} Especially with communications, the pentomic organization depended on the new equipment. Reorganizing in 1957, as Taylor had ordered, based on equipment that would not be available until 1960, pending no other contractual problems, remained a recipe for disaster.

The same lack of progress was noted in the FY57 Fourth Quarter report from CONARC on the artillery weapons of the pentomic organizations. While the Honest John and Little John missile systems were progressing well, the battle group’s artillery piece, the “moritzer,” was still in the planning stage, forcing soldiers to retain the substitute 4.2-inch mortar. Perhaps because the M59 armored carrier had been adapted to carry the mortar and its ammunition, the moritzer fell in priority for development; it did not appear in CONARC’s quarterly summery of activities again until Fourth Quarter, FY59.\textsuperscript{46} The division general support artillery, another key element of the Pentana Study, received some attention in the Fourth Quarter, FY57 report. General Wyman believed it was an important piece of equipment; he directed “a program be initiated to develop a suitable organic division weapon capable of accurate and economical delivery of atomic warheads in close support of troops.”\textsuperscript{47} With the pentomic reorganization, division artillery with nuclear capability already included the Honest John family and the 8-inch howitzer. The evolution of the division general support artillery weapon eventually shifted to the development of a nuclear round for the 155mm howitzer and the requirement for a new weapon system quietly ended.\textsuperscript{48}

Besides equipment issues, organizational controversies continued to erupt as the divisions shifted to the pentomic organization. Some Command and General Staff
Officers Course (CGSOC) students took the opportunity to focus their required written products on how the battle group would operate in combat. Major F. L. Worthington 1958 paper, “What the Platoon Leader Would Like to Say to His Battle Group Commander,” described the impossible situation of a rifle platoon leader in a pentomic organization tasked with defending a battle position. Referencing the appropriate CGSC manuals, Worthington noted that a pentomic company was expected to defend a frontage of 2400 yards – in comparison to the pre-pentomic company’s 1000-yard front – and that each platoon leader had to defend 800 yards. Worthington argued that in the pentomic organization the distance between individual riflemen was too great, that the reallocation of weapons within the infantry company and battle group was ineffective, that communications among and between platoons was nonexistent, and that there was no supporting mortar fire readily available to the platoon. He concluded that the pentomic company was actually inferior to its predecessor.

While this example is representative of the pentomic organization’s critiques, it does indicate the impressions and concerns of the soldiers who were asked to fight with it. Atomic firepower and blast effects had their supporters at the upper echelons of the Army. Yet, when it came down to placing individual soldiers in fighting positions, the challenges created by the organization based on the use of atomic weapons were beyond the ability of those tasked to employ the organization. Worthington may have said it best: “At this point [a platoon defense] atomic weapons and helicopters may as well not even exist for all the good this modern technology is doing me.”

While CGSOC students may offer only anecdotal evidence about the new organizations shortcomings, the War Games Division of CONARC’s Combat
Developments Office, conducted a more rigorous assessment through 1957. It used rudimentary computer analysis to reach the results it sent forward to CONARC headquarters in February 1958. In its report, War Games Division identified several of the shortcomings of the division organization and reiterated the requirements for new equipment. The advantage of this report was the statistical and scientific analysis given to the Pentana Study by an independent organization. Its conclusions, though not as blunt as Worthington’s, were an indictment of Taylor’s high-level decision to change the Army without implementing the lower level requirements necessary to effect the change.

The report dispensed with the idea that an atomic battlefield presented a new challenge to a tactical commander. It asserted that no commander could know whether an enemy was going to use the weapon before it happened, therefore tactics had to be common for atomic and non-atomic combat. It then summarized the results of the war games: “Although much of the comparative combat superiority of PENTANA accrues from weapons and equipment with assumed characteristics superior to weapons currently employed, the PENTANA organization possesses substantially greater firepower, flexibility, and recuperative power over the 1956 organization on an atomic battlefield, while retaining an equivalent or improved capability on the conventional battlefield.”

Phrased in this manner, the report said officially what others had said unofficially: the Pentana Study created an organization that was optimized for atomic war, but was only equal to or slightly better than the current organization. If atomic war was ruled out, there was no good reason to change the division structure.

The report also identified several other key deficiencies to the divisional pentomic structure. The defensive firepower of the division was greatly increased because of the
atomic weapons, but only if atomic weapons were used. Otherwise, defensive firepower had actually decreased. The report assessed that armored personnel carriers were very effective in offensive actions and provided extra protection against atomic effects. It found that the tank units, consolidated at corps under the pentomic organizations, were frequently re-attached to divisions and battle groups because neither had any mounted combat vehicle capable of supporting the infantry personnel carriers. Artillery fire coordination centers, absent from the pentomic division, was a serious shortfall identified in the report. Centralization of certain specialties, such as electronic warfare and intelligence, was effective, but others, such as supply and maintenance, left much to be desired; the centralization-decentralization proposals needed reevaluation. Finally, the study indicated that division frontages were acceptable at approximately 25,000 yards, doubling the World War II standard. The study did admit: “Assigning frontages to permit a large measure of contiguous mutual support between subunits is not a consideration of primary importance within the PENTANA concept.” Moreover, the report concluded that although the pentomic division’s equipment was potentially superior to its predecessor, if that same equipment was given to the current organization, it would be superior to the pentomic organization.

The report then went on to criticize the DART as a defensive weapon only, unable to be used offensively because of its limitations of use. The resultant conclusion was that the tank remained the best anti-tank weapon in the U.S. inventory. Assessing aviation assets, area fire support, small arms, automatic weapons, and air defense, the report gave marginal support to the pentomic organization. In each area, the old division structure was assessed to be better for non-atomic warfare. When War Games Division studied the
impact of atomic attack on the old and new organizations, it concluded: “The analysis
disclosed that, in atomic warfare, casualties will remain high irrespective of organization.
No militarily significant difference was disclosed in the percentage of casualties
sustained by either type of division. The PENTANA units sustained a lower number of
casualties that were directly proportional to the reduced strength of the division.” The
pentomic division was better able to react after an atomic blast because of the greater
number of subordinate headquarters in it. The greater target signature of battle groups,
due to its armored carriers and electronic emissions, offset this by making the battle
group more visible to an enemy.\textsuperscript{55} It is difficult to understand how any official reading
the report could continue to endorse the pentomic organization.

CONARC reacted to the report by authorizing additional studies to determine the
best organization for combat. Following the same methodology as the earlier ATFA
studies, the Pentana Study became the baseline for future restructuring efforts. By the
summer of 1958, CGSC produced a study that acknowledged the probability of two types
of division for the near future: a light and a heavy division. The study, “Tactical Atomic
Plenty Field Army (TAPFA),” capitalized on the February CONARC war game analysis
of the Pentana Study and reshuffled some of the divisional units as recommended. Its
version of the division structure remained roughly equivalent to the pentomic
organization, modifying the artillery and infantry battle group organizations only.\textsuperscript{56} At
the same time, the Infantry School at Fort Benning completed a study titled: “Infantry
Atomic Non-Atomic Basic Battle Unit.” It restructured the pentomic infantry battle
group to create a more efficient unit, with greater machine gun firepower and greater
ability to coordinate artillery fires.\textsuperscript{57} Combat Operations Research Group (CORG) also
suggested a modified pentomic infantry organization to minimize the failings it identified in its report.

The cumulative result of these reports was a new requirement for CONARC: it had to solve the organizational problem and determine which structure was best for the Army. By early 1959, it ordered an FY60 experiment at Fort Ord and Fort Hunter Liggett to determine the answer. CONARC defined the objectives so that some measure of effectiveness could be used against the different organizations, ensuring a common base for each of the test units and a common enemy for each to fight against. The ever-present objective, “identify those items of material most critical to the operation of the units,” was also included. From a combat developer’s perspective, this experimentation was the right effort to find the right organization, but from a unit commander’s perspective it created a nightmare of having to work within an organization that seemed to change almost daily.

One of recommendations from the CGSC TAPFA Study was the need for a small, lightweight atomic round that was instantly responsive to the battle group commander for critical situations. This weapon was necessary because neither the current mortar nor the projected moritzer provided enough fires to stop a massed enemy. Because of miniaturization of components and availability of material, the result was the Army’s smallest nuclear weapon, the Davy Crockett. A new recoilless rifle, yet to be developed, launched the projectile, designed as two different magnitudes of atomic explosions, to explode somewhere between 2200-4000 yards from the firing position. Eventually each battle group was intended to have six launchers. This new piece of equipment must have truly impressed, or scared, the soldiers who manned it.
The armored division did not miss out on the Pentana Study’s reassessments in the late fifties. After the required implementation and troop exercises in late 1956 and 1957, proposals were forwarded through the Armor Center at Fort Knox to CONARC and the Army Staff where they were studied and evaluated. By the end of 1958, new TO&Es were sent to the field for implementation. The armored division organization was significant for the changes that were not made. Three combat commands were retained, as were the tank and armored infantry battalions, the division artillery, and the division trains. Modifications to the division artillery’s fire support coordination center, the armored engineer, quartermaster, and ordnance battalions increased their capabilities; the administrative services and MP companies were reduced in numbers. Other modifications to the armored cavalry squadron’s troops increased their capability, but did not increase their personnel authorization. With four active armored divisions and five in the reserves, these changes were fairly insignificant in the overall Army personnel or equipment picture. Seemingly, the armored division was such a specific organization, with specific missions, that there was little that could be changed to make it a significantly better unit. New equipment slowly migrated to each unit, some names changed, and organizational modifications were made, but the basic organization of the armored division in 1958 was essentially the same as when Major General Bruce Clark conducted Exercise LONG HORN with the 1st Armored Division in 1952.

As debate continued over which organization the infantry division should adopt and the airborne and armored divisions muddled through their modifications, the echelons above division and corps were ignored. As discussed in Chapter Three, an essential element of the Pentana Study involved the migration of combat support and
combat service support to the corps and army level. A significant portion of the Pentana Study focused on the logistical basis for the corps and field army. The divisional organizations were predicated on the idea that small elements of support and service support would be consolidated at a higher level and made available to the divisions when needed. For the corps level artillery, this methodology of support worked; for anti-aircraft artillery, the support did not work. Each area had been tested or assessed in exercises or computer analysis by the late fifties. But for the logistical structure of the corps and army, there is scant evidence that the issue was ever addressed in any analysis or war game.

For various reasons, logistics did not receive much attention from either Taylor or the Army Staff. When the Chief of Staff summoned his service school commandants to Washington in 1957 to sell them on the pentomic organization, no one briefed the assembled generals on logistics or sustainment of the new divisions. The only briefing that could have touched on it instead addressed doctrinal differences between the Army and the Air Force. Given the audience and the stated reliance on aerial lines of communication in the Pentana Study, this was a serious shortfall. At the Combat Developments Conference later in the year, one briefer actually referred to the failure to develop adequate logistical guidance to keep pace with the tactical pentomic developments. He indicated a “major effort is now required” to define the logistical requirements in support of the Pentana Study. Eventually, CONARC contracted with Melpar, Inc. to study “the optimum intra-theater logistic support system for 1960-1970.” If the study was ever completed, it had no discernable impact. The CONARC R&D summaries subsequent to the May Combat Developments Conference included no
reference to it. The summary of a Combat Developments Logistical Conference held at
Fort Monroe in April 1959 indicated that little if any logistical reorganization had been
accomplished. “A strong command decision” was required “to allow the logistical
structure to become current with the existing PENTOMIC tactical structure.”63
Considering the advances made in the infantry division reorganization by 1959, the corps
and army logistical structure was a forgotten item.

Changes to corps level organizations were not made as rigorously as the 1956
TO&E changes to the infantry and armored divisions. In fact, changes to units above the
division were rare for this period. While most chemical, engineer, medical, ordnance,
quartermaster, signal, military intelligence, and air defense units had a TO&E in 1955,
many were not changed again for five or six years. In some cases, the army level units
were not changed until the mid-sixties.64 This failure to adjust the upper echelons of the
corps and army units represents one of the greatest failures of the Army reorganization
effort of the fifties. The Korean War experiences indicated that efficiencies could be
achieved by consolidating the little used elements of a division or corps at the next higher
level. Studies such as ATFA, Project BINNACLE, and Pentana reached the same
conclusions. Yet these organizations, many of which existed in the reserve components
of the Army National Guard and the Army Reserve, did not reorganize to support a
division of five battle groups or a corps of five divisions.

By 1959, with the pentomic reorganization nearing completion, General Bruce C.
Clarke assumed command of CONARC from General Wyman, who retired. Clarke was
an early advocate of the combat command and battle group organization and directed his
staff to take the Pentana Study one step further. He wanted greater protection and
mobility for a division and sought a way to effect that change with a study titled “Modern Mobile Army 1965-1970 (MOMAR I).” As this study developed under Clarke, the Pentana Study slowly faded into the distance. When the Army Vice Chief of Staff Clyde Eddleman rejected the MOMAR I proposals and ordered a different approach to division and corps organization, the pentomic army itself receded into memory as a failed experiment of the 1950s.

The pentomic organizations, heralded by the senior Army leadership in 1956, did not measure up to its promises. Perhaps the required changes were too many to accomplish in the mid-fifties, given the fiscal realities. Perhaps the scientific and business community made promises that were too exorbitant and unrealistic. General Taylor wanted the organization to work and took the risks that the promises were not too unrealistic and the fiscal challenges could be resolved. Taylor was not alone in his support of the new organization, but the reluctant support of his senior subordinates did not indicate complete acceptance of his ideas. Furthermore, junior officers had a more difficult time accepting the new companies and platoons without the required equipment. One is left to ponder the question that captains and lieutenants certainly asked frequently: If this new organization is better than the old because of more advanced equipment that is not here yet, am I expected to defend this position with a due-out slip for that new equipment? The pentomic division, an organization implemented before it was ready, faded from the rolls but remained in memory because of its promises that went unfulfilled.
1 Ltr., Chief of Staff to Commanding General, Continental Army Command, 1 June 1956, subj.: “Army Organization,” 2-3, USAMHI, Carlisle, PA.

2 Ibid, Inclosure 1, 2-3. The mention of guerilla forces is interesting in the context of 1956. Perhaps the influences of French actions in Indochina or the British in Malaya are more far-reaching than previously supposed.


4 Operation GYROSCOPE involved the rotation of units from the U.S. to Europe in an effort to improve morale and unit combat readiness. One of the rotating units was the 11th Infantry Division (Airborne) from Fort Campbell, KY. It replaced the 5th Infantry Division, which returned from Germany to Fort Ord, CA. The 101st moved from Fort Jackson, SC to Fort Campbell to replace the 11th, simply falling in on the equipment the 11th left behind. See Wilson, *Maneuver and Firepower*, 252-254.

5 Wilson, 193-196, 239-256. The XVIII Airborne Corps and the 11th, 13th, 17th, 82nd, and 101st Infantry Divisions (Airborne) ended the war. By 1955, only the Corps and the 11th and 82nd remained on active duty. Several Reserve Component divisions were designated airborne, though they never performed as such.

6 Ltr, Major General Paul D. Adams, ACofS, G3 to Major General Garrison Davidson, Commandant, USACGSC, 10 June 1955, no subject, CARL, Fort Leavenworth, KS. The assault echelon of an airborne division consisted of the fighting units needed to seize an
initial airhead, with some portions of artillery, engineer, and logistical support, all of which arrives either by parachute or air-landing. The follow-up echelon consists of the remainder of the division that is needed to sustain operations in the airhead, usually the major pieces of equipment for the artillery, engineer, and logistical units. See also TO&E 57C (Airborne Division), 20 December 1955 and TO&E 57T ROTAD (Airborne Division), 10 August 1956, both USAMHI, Carlisle, PA.

7 Ltr., Major General Garrison Davidson, Commandant, USACGSC to Major General Paul D. Adams, ACoFS, G3, 24 July 1955, no subject, 1, CARL, Fort Leavenworth, KS.

8 Ibid, 2.

9 Ibid, 3-4.

10 Ltr, Headquarters, CONARC to Commandants, The Infantry School, et. al., 10 November 1955, subj.: Reorganization of the Airborne Division, Short Title: ROTAD, CARL, Fort Leavenworth, KS; TO&E 57T ROTAD (Airborne Division), 10 August 1956; TO&E 5-225C (Airborne Engineer Battalion), 9 September 1955; TO&E 5-225T ROTAD (Airborne Engineer Battalion), 10 August 1956; TO&E 6-200C (Division Artillery, Airborne Division), 14 December 1955; TO&E 6-200T ROTAD (Division Artillery, Airborne Division), 10 August 1956, USAMHI, Carlisle, PA.

11 Ltr., Headquarters, CONARC to Commandants, The Infantry School, et. al., 10 November 1955, subj.: Reorganization of the Airborne Division, Short Title: ROTAD, Inclosure 2, 1, CARL, Fort Leavenworth, KS.

12 Wilson, 274; TO&E 7-31T ROTAD (Airborne Combat Group), 10 August 1956 and TO&E 6-200T ROTAD (Division Artillery), 10 August 1956, USAMHI, Carlisle, PA.
Percentages are noted in Semiannual R&D Report for CONARC Summary, 1 January-30 June 1956, Combat Operations Research Group Section, 12-18, USAMHI, Carlisle, PA. During Exercise JUMP LIGHT, the differences were noted as “Increase in infantry rifle strengths to 300 rifle squads for a total of 3,300 men from 243 rifle squads for a total of 2,187 men.” Addendum No. 1 to General Information Pamphlet, Troop Test Jump Light, Troop Test HQ, Troop Test JUMP LIGHT, Fort Campbell, KY, USAMHI, Carlisle, PA.

Semiannual R&D Report for CONARC Summary, 1 January-30 June 1956, Combat Operations Research Group Section, 12-18, USAMHI, Carlisle, PA; in 1954, a decision was made to modify the Honest John system to make it a family of missiles, with the Honest John Junior, renamed the Little John, allocated to airborne units and the Honest John Senior allocated to corps and army artillery groups. TO&E 29-57T (Supply and Transport Company, Support Group, Airborne Infantry Division) (ROTAD), August 1956, shows a decrease in trucks over its predecessor. Based on the semiannual report and the drop in artillery pieces, the best conclusion relates to less ammunition to haul.

Ibid, 18-19.

Ibid, 21-22.

Of the five battle group commanders, four went on to the general officer ranks: General Barrie Zais, Lt. General George Forsythe, Lt. General Harry Kinnard, and Major General William Kuhn. It is no coincidence that the battle group commanders were all that good.

Ltr, Major General Paul D. Adams, ACofS, G3 to Major General Garrison Davidson, Commandant, USACGSC, 10 June 1955, no subject, CARL, Fort Leavenworth, KS.

13
14
15
16
17
18

20 TO&E 7-26T ATFA (Headquarters, Headquarters and Service Company, Armored Infantry Battalion), 30 June 1955; TO&E 7-26T ROTAD (Headquarters, Headquarters and Service Company, Armored Infantry Battalion), 1 December 1956; TO&E 17-26T ATFA (Headquarters, Headquarters and Services Company, Tank Battalion, Armored Division), 30 June 1955; TO&E 17-26T ROTAD (Headquarters, Headquarters and Service Company, Tank Battalion, Armored Division), 1 December 1956, USAMHI, Carlisle, PA. Each battalion also received 5-ton trucks with tank-and-pump units for their fuel platoons, a major improvement over refueling with a thousand 5-gallon cans. This also made the two HH&S companies nearly identical, differing only in numbers assigned, a major accomplishment by itself.

21 TO&E 6-300T ROCAD (Division Artillery, Armored Division), December 1956, USAMHI, Carlisle, PA; Stephen I. Schwartz, ed., *Atomic Audit* (Washington, DC: Brookings Institution Press, 1998), 155, indicates that the 8-inch atomic round was developed and fielded by 1956.

22 The basic combat engineer company decreased in personnel, but increased in equipment to compensate; TO&E 5-217T ATFA (Engineer Company, Combat, Armored Engineer Battalion), 30 June 1955; TO&E 5-217T ROCAD (Combat Engineer Company, Armored Engineer Battalion), 1 December 1956, USAMHI, Carlisle, PA. The bridge company eliminated the Bailey bridge and received more pontoon bridge equipment; TO&E 5-218T ATFA (Bridge Company, Armored Engineer Battalion), 30 June 1955;
TO&E 5-218T ROCAD (Bridge Company, Armored Engineer Battalion), 1 December 1956, USAMHI, Carlisle, PA. The ATFA reconnaissance battalion changed its name to armored cavalry battalion, then dropped the battalion to adopt the traditional cavalry name of squadron, all part of the new Combat Arms Regimental System. Its addition was a 43-man reconnaissance and surveillance platoon equipped with airborne and ground radars; TO&E 17-46T ATFA (Headquarters, Headquarters and Service Company, Reconnaissance Battalion, Armored Division), 30 June 1955; TO&E 17-46T ROCAD (Headquarters, Headquarters and Service Company, Armored Cavalry Battalion, Armored Division), 1 December 1956, USAMHI, Carlisle, PA.

23 This structure and organization has survived to the present with forward support battalions and the main support battalion performing their functions today as had been suggested in 1956 with very few changes; TO&E 9-65R (Armored Ordnance Battalion), 4 March 1955; TO&E 9-65T ROCAD (Armored Ordnance Battalion), 1 December 1956; TO&E 9-67R (Company, Armored Ordnance Battalion), 4 March 1955; TO&E 9-67T ROCAD (Forward Support Company, Armored Ordnance Battalion), 1 December 1956; TO&E 9-66D (Headquarters and Main Support Company, Armored Ordnance Battalion), 1 December 1956, USAMHI, Carlisle, PA.

24 TO&E 17T ATFA (Armored Division), 30 June 1955; TO&E 17T ROCAD (Armored Division), 1 December 1956, USAMHI, Carlisle, PA.

25 TO&E 7C (Infantry Division), 23 August 1956; TO&E 7T ROCID (Infantry Division), 20 December 1956, USAMHI, Carlisle, PA.
26. TO&E 7-17C (Infantry Rifle Company), 13 June 1956; TO&E 7-17T ROCID (Infantry Rifle Company), 20 December 1956, USAMHI, Carlisle, PA.

27. TO&E 6-100C (Infantry Division Artillery), 13 February 1956; TO&E 6-100T ROCID (Infantry Division Artillery), 20 December 1956, USAMHI, Carlisle, PA.

28. TO&E 6-101T ROCID (Headquarters and Headquarters battery, Infantry Division Artillery), 20 December 1956; TO&E 6-129T ROCID (Service Battery, 105mmHowitzer Battalion, Infantry Division Artillery), 20 December 1956; 6-149T ROCID (Service Battery, Field Artillery Battalion [Composite], Infantry Division Artillery), 20 December 1956, USAMHI, Carlisle, PA.

29. Wilber M. Brucker, “A Year of Army Progress,” Army Information Digest, 12, no. 2 (February 1957), 2-7; Clyde D. Eddleman, “Military Operations,” Army Information Digest, 12, no. 2 (February 1957), 17-23; and Office, Chief of Research and Development, “Research and Development,” Army Information Digest, 12, no. 2 (February 1957), 40-48, all discuss the changes in division organization, specifically mentioning both the 101st Division and the infantry battle groups in other divisions; “Run Down on the 101,” Army, 7, no. 3 (October 1956), 50-53, explains the organization and operating principles of the 101st Division; the entire issue of Army, 7, no. 5 (December 1956), is devoted to the Association of the United States Army (AUSA) Annual Meeting Report in which the future Army is described and promoted by Taylor, Eddleman, and other members of the Army Staff, to include Major General E. C. Erikson, Chief, National Guard Bureau, Dr. Werner Von Braun, and Dr. Edward Teller.
The Armor School Program of Instruction for Course 17-0-3, Armor Officer Advanced Course, September 1956, Fort Knox, Kentucky, Armor School Library, Fort Knox, KY; The Infantry School Program of Instruction for Course 11-5, Infantry Officer Advanced Course, January 1957, Fort Benning, Georgia, CARL, Fort Leavenworth, KS; Command and General Staff College Program of Instruction, Academic Year 1957, Lesson 6217, Corps in Mobile Defense, Fort Leavenworth, Kansas, CARL, Fort Leavenworth, KS.


Brigadier General (Ret) Theodore C. Mataxis, telephone interview by author, 12 February 2003, Carlisle, PA. Mataxis later went on to command a battle group in the 8th Infantry Division, then in Europe. He adjusted the pentomic structure of his unit and described how in: “Tailor Your Own,” Army, XI, no. 11 (June 1961), 53-58; by then he had returned to his dissatisfaction with the pentomic organization.
35 Ltr, HQ, U.S. Continental Army Command to Commanding Generals, USARPAC, 5th Army, 12 March 1957, subj.: “Evaluation of New Infantry Division,” CARL, Fort Leavenworth, KS.

36 Ibid, 2.

37 Major General (Ret.) Thomas H. Tait, interview by author, 28 September 2003, Lexington, VA.

38 “Pentomic Reorganization in Germany,” Military Review, 37, no.12 (March 1958), 73, reported all of 7th Army was complete; Wilson, 281-282; “Complete Pentomic Conversion,” Army, 8, no. 5 (December 1957), indicates that all the U.S. based divisions and Far East divisions have completed the conversion with the exception of 9th Infantry Division which was expected to be complete in February 1958.

39 Wilson, 279.


41 Ibid, 52-54.

42 In August 1956, CONARC removed the Combat Developments Office from the Deputy Commanding General as an additional duty, as it had been with Major General Montague, and created a new office for Combat Developments, with a three-star general
in charge. This is an indication of the level of attention that CD now received from both
the Army Staff, which had to endorse the change, and CONARC.

43 Final Report of the United States Army Armor Policy Conference, 26-29 March 1957,
Appendix 1, Section II, Part A, “Effect of Nuclear Weapons on Tactics and Organization
of Armor Units,” and Part B, “Protection Against Nuclear Effects Afforded by Present
Armored Vehicles,” Patton Museum of Cavalry and Armor Library, Fort Knox, KY.

44 Ibid, quotes from Part B, 18-19; Hunnicutt, Patton, 152-163, describes the evolution
from the M48 series to the M60 series of tanks.

45 USASCEL Annual Research and Development Summary of Major Events and
Problems, FY 1957, 5 February 1958, 6, Signal Corps Archives, Fort Monmouth, NJ.

46 A review of the quarterly reports from FY57, FY58, and FY59 make no mention of the
moritzer until 4QTR/FY59, USAMHI, Carlisle, PA.

47 Fourth Quarter, Fiscal Year 1957, Review and Analysis of Combat Developments, 26
August 1957, Headquarters, U.S. Continental Army Command, Fort Monroe, VA, 4,
USAMHI, Carlisle, PA.

48 Ibid; Schwartz, 155.

49 F. L. Worthington, “What the Platoon Leader Would Like to Say to His Battle group
Commander,” 17 January 1958, Command and General Staff College, Fort Leavenworth,
KS, CARL, Fort Leavenworth, KS.

50 Ibid, 2-4.

51 Ibid, 3.

53 Ibid, 4-9.


56 *Tactical Atomic Plenty Field Army*, USACGSC, Fort Leavenworth, KS, 5 July 1958, 5-14, USAMHI, Carlisle, PA.

57 Infantry Atomic Non-Atomic Basic Battle Unit, USA Infantry School, Fort Benning, GA, 15 June 1958, 4-11, USAMHI, Carlisle, PA.

58 Ltr, HQ, USCONARC to various, 18 February 1959, subj.: “Comparative Experimentation with Basic Fighting Organizations,” 2-3, USAMHI, Carlisle, PA.


60 John A. Beall, “Revisions to ROCAD,“ *Armor*, 68, no. 2 (March-April 1959), 48-51; TO&E 6-301D (Draft) (Headquarters and Headquarters Battery, Armored Division Artillery), 1959; TO&E 10-47D (Draft) (Supply Company, Armored Division Quartermaster Battalion), 1959; TO&E 9-67D (Draft) (Forward Support Company,
Armored Division Ordnance Battalion), 1959; TO&E 17-57D (Draft) (Reconnaissance Troop, Armored Cavalry Squadron), March 1959, USAMHI, Carlisle, PA.


64 Review of TO&Es for chemical (3 series), engineer (5 series), medical (8 series), ordnance (9 series), quartermaster (10 series), signal (11 series), intelligence (30 series), and air defense (44 series) units indicate very little change in the pentomic army. Some units, such as a topographic engineer company, are understandable in its six-year existence. Others, such as the water supply company, are not: this company existed under the same TO&E from 1955 to 1968. All TO&Es are USAMHI, Carlisle, PA.

CHAPTER 6

THE PAST IS PRESENT, AGAIN

The pentomic organization was a tremendous step forward for the Army. By concentrating combat functions in the battle groups and the combat support and service support functions at division, the battle group commander could focus on fighting his unit. He had the necessary soldiers and combat support to accomplish his assigned missions. The battle groups in combination created an area of operations that was more extended and dispersed, yet concentrated more firepower than its World War II predecessor. But the pentomic experiment lasted only from 1956 until 1960, when it was abruptly terminated by General George Decker, Taylor’s replacement as Army Chief of Staff. Why did the Army abort this innovative and potentially revolutionary change? Was the pentomic reorganization a victim of the reactionary “military mind?” Was it rendered ineffective by changes in technology or the nature of the military threat? Or were there other, more significant reasons for its demise?

Perhaps a more significant question was whether the pentomic organization was bankrupt from the beginning? Were the battle groups and their parent organization, the pentomic division, viable tactical units? Certainly in concept the battle group made a

206
great deal of sense. It was intended to be a compact, integrated tactical unit, capable of attacking and defending as a part of a larger organization. Its five infantry companies and artillery battery had the necessary men, equipment, and communications, at least on paper, to perform the missions described in the Pentana Study. The battle group carried sufficient supplies to maintain itself for three days of combat. If the planned armored personnel carriers and tactical atomic missiles had been deployed – and if they worked as they were supposed to – then the battle group would have been a truly powerful unit. However, as was the case throughout the pentomic experiment, these necessary assets were not distributed until very late, and not to all battle groups. Perhaps more importantly, the battle groups’ strengths were counteracted by a number of serious weaknesses. The number of radios in the infantry companies was inadequate to communicate with the individual platoons and sections within the company in the fast-moving, long-range operations that were supposed to be the battle group’s forte. Even when the battle group was in a defensive position, its commander lacked sufficient radios to control his dispersed companies once they moved. The Army was unable to create or implement a fire direction center within the battle group headquarters to coordinate and integrate its organic mortar and howitzer units. Even more serious was the inability to integrate division artillery with the battle group’s fires. Though a fire direction center existed within the division, no comparable element existed within the battle group. Neither of these problems was insurmountable in the fifties. There were sufficient radios to link platoons and sections together and fire direction centers could have been established, but neither problem was recognized until too late.
Like the battle group, the pentomic division made a great deal of sense, at least in theory. The division commander had the artillery firepower to support and affect the battle around his subordinate battle groups. Communications and fire direction, the two keys to facilitate the division commander’s desires, existed and were adequate for the task. The problem for the division commander was logistics. Quite simply, the pentomic division’s support command could not have sustained the division in active operations. The supply and transport battalion had insufficient transportation to carry the basic loads of ammunition, food, and water over the long distances and sustained combat envisioned for the division. Such problems at the division level were serious, but they were not overwhelming. The necessary equipment existed and could easily have been authorized for the divisions; personnel allocations were not impossible even given Defense Secretary Wilson’s directed reductions in force.

A further problem was in the corps and army levels above the division. These were never reorganized to incorporate the requirements for the new division, but remained structured to support the triangular division of World War II. The result was that corps units were under strength to support a pentomic division. Since one unit of a particular type – ranging from quartermaster to ordnance to transportation – could not provide sufficient support, two units were required to support the new division. This created inefficient allocations of scarce units and resulted in excess capacity in the wrong places on the battlefield, not to mention a more lucrative atomic target. The same shortfall existed at the field army level. Because this problem was never addressed, tactical plans for the defense of Europe or Korea, although including a number of support units, could not have sustained pentomic divisions for more than a few days of combat.
The pentomic organization also made two changes – one in personnel and one historic – that caused great antagonism. Very simply, the pentomic division cut out an entire level of command, and in the process threatened the promotion prospects of hundreds of officers. A colonel commanded an infantry battle group. He had two lieutenant colonels beneath him as deputy command and chief of staff respectively, but neither commanded any troop units. The next echelon below the battle group was the company, commanded by a captain. Nowhere in the chain did a lieutenant colonel command a unit, thus creating a gap of twelve to fifteen years between commands. In effect, this meant that the only place that an infantry lieutenant colonel could learn the art of command was if he were assigned to an armored infantry battalion in an armored division, for they still retained the battalion structure in its combat commands. No other branch besides infantry was affected in this way, yet infantry had the largest number of lieutenant colonels. Without the battalion structure to learn a different level of tactical expertise, the only way to assess a potential battle group commander was through his actions as a staff officer, a position that required very different skills. Though a colonel and captain commanded units in the pentomic division, their levels of command required very different skills. Somehow, the lieutenant colonel command position had to be restored.

A related aspect of the lieutenant colonel command demise may be a careerist issue. The Cold War Army was the largest peacetime army the United States had ever maintained. Since command was the only path to the general officer ranks, the loss of one level of command could be seen as the loss of one stepping-stone to the “stars.” Since that loss affected infantry branch the most, one is left to consider how popular the
pentagonal organization was among infantry officers. Junior officers probably saw
limited command opportunities after company command; why should they remain in
service with only staff positions available to them? Armored divisions offered some
relief, but with only four active armored divisions that meant only sixteen armored
infantry battalion commands. Only half of them would be available in any year because
of the two-year command cycle rotation. Though not an aspect addressed in any
professional or personal papers from the time, careerism must be considered as one
reason the pentagonal organizations failed to gain support among the rank and file of the
Army.

The historic problem was the reaction to the demise of the regiment. While many
leaders detested the regimental “good-ol’-boy” network, the unit itself carried historic
and emotional significance. For over a century, the regiment had been the “home” of
both officers and enlisted men. By abolishing the regiment, the Army in a stroke severed
that bond, and it took many years to restore a high level of emotional attachment within
tactical units. To this day the Army has refused to reinstate the regiment except in a few
particular cases: the 2nd and 3rd Armored Cavalry Regiments and the 75th Infantry
Regiment (Ranger). No other regiment today exists under a table of organization and
equipment, though many others exist on a provisional basis. Failure to understand the
cultural and emotional attachment to the regiment can only be laid at the feet of the Chief
of Staff Maxwell D. Taylor. However, the many briefings that led up to that decision
indicate that the decision to abolish these historic units had at least the tacit endorsement
of many other senior leaders. Certainly those who opposed Taylor’s decision kept their
objections to themselves, perhaps more out of personal rather than professional reasons.
Much has been written about the influence of atomic weapons on the pentomic organizations. This is not surprising, since the division itself owed its origins to the fact that these weapons prohibited the massive concentration of manpower and firepower the triangular divisions of Korea or World War II were designed to facilitate. With atomic weapons, dispersion was necessary for survival, and this in turn required a division that could move rapidly, strike hard, and then scatter before its opponent could call in atomic weapons. Several facts emerge as a result of all the foregoing analysis that seem counter to the prevailing assumptions. The Army adopted atomic weapons primarily because Eisenhower endorsed it. Army experimentation was on-going when he assumed office; neither he nor Defense Secretary Wilson did little to curtail its development. For the most part, the atomic weapons that emerged under Army research were artillery rounds and artillery rockets and missiles that enabled the division commander to influence his battle groups’ fight. Under the ATFA studies or the Pentana Study, there were no atomic weapons in either the combat command or the pentomic battle group. Those units fought with conventional weapons, but fought with more of them and at greater dispersion and ranges than their World War II or Korean counterparts. A battle group commander could call on atomic weapons, but he had none to directly affect his battle.

Next, the division commander had atomic weapons, but he did not have many of them. He could use his Honest John missiles or the few 8-inch howitzers available to him to attack certain areas of his zone or sector, but he could not use them ubiquitously around the battlefield. Few weapons, with fewer rounds, had to be used judiciously and carefully so current or future operations were not compromised by the weapons’ effects. Though corps artillery or Air Force-delivered weapons were an atomic option, there was
never enough of either for a division commander to base his plans on their availability. Thus conventional weapons played a very important part in the division battle.

Finally, when the Davy Crockett entered the battle group inventory, its use was tied to the battle group commander’s authority to employ it. In effect, the battle group commander was empowered to make a strategic decision – whether the U.S. would initiate the use of nuclear weapons or not – that only the president was supposed to make. Not surprisingly, the implications of this were soon realized and steps taken to bring nuclear weapons under control. By the early 1960s, when the Davy Crockett arrived in units, that authority had already been withdrawn from him and reserved at the theater commander’s level. And indeed, it is likely that the authority had been further withdrawn all the way back to the White House. Thus, even as the pentomic division faded from the limelight, its smallest atomic weapon had already been neutralized and was no more than a burden on its firing team.

A final problem with the pentomic organization was the personalities who were responsible for implementing it. Even considering all the problems with the battle group and division that have been discussed so far, its ultimate failure has to lie with the senior Army leadership and not just Maxwell D. Taylor. Many other senior leaders were part of the organizational, logistical, and R&D fields and should have made a great investment in the pentagonal structure. Taylor directed the Pentana Study’s implementation and he should have devoted more time in its development. But the CONARC commanders, both Dahlquist and Wyman, should have ensured that the research and development process remained focused on the new requirements. Instead many contracts slipped and industry failed to deliver on their promises. Most, if not all, of the necessary equipment for the
pentomic division and battle group eventually came into the Army inventory, but long after the pentagonal structure was shelved.

The short-lived pentomic structures cannot be tied to only one problem. The individual challenges of technological advances, personnel assignment, unit restructuring, and command personalities each represented a significant obstacle to the successful implementation of the new pentagonal organization. But, when taken in combination, and adding the challenges of daily operations, the weight of change was too much for the Army system of the fifties. The speed of information sharing and decision-making could not stay abreast with developments in all the fields that affected the Army’s fighting organizations.

One can only venture a guess how the Army would have conducted operations if the equipment arrived in time. Perhaps the best indication of what the army would have done is available today. Under its current leadership, the Army is restructuring the division with five brigades, frequently called brigade battle groups or combat teams, each with two combat battalions of four companies. The brigade has assigned engineers, intelligence, reconnaissance, artillery, and logistical support units to make it a self-contained, deployable organization. The brigade is still commanded by a colonel, but the lieutenant colonel command position is retained. The division commander retains some combat support and combat service support to influence the actions of the subordinate brigades. Almost forty-five years after the demise of the pentomic division, its near-mirrored image has returned. This time, technological advances are incorporated into the brigades as it develops; research and development is focused on the shortfalls. Perhaps this evolution will last longer than four years.
BIBLIOGRAPHY

PRIMARY SOURCES

A. Archives

U.S. Army Armor Center and Fort Knox, Kentucky

Patton Museum of Cavalry and Armor
  Mark Falkovich Collection
  Armor Advisory Conference Reports
  Tripartite Conference Reports

U.S. Army Armor School Library
  Programs of Instruction, Armor Officer Advanced Course
  Student Reports and Projects

U.S. Army Military History Institute, Carlisle, Pennsylvania (USAMHI)

Continental Army Command Combat Development Semiannual Summaries

Curricula Archives
  Resident Course Student Papers

Maneuver Exercise Reports
  SNOW FALL
  LONG HORN
  FLASH BURN
  SPEARHEAD
  BLUE BOLT
  FOLLOW ME
  SAGEBRUSH
  JUMP LIGHT
Oral Histories
   General George H. Decker
   General Melvin Zais
   General Maxwell D. Taylor
   General Clyde D. Eddleman
   Lieutenant General James M. Gavin
   Lieutenant General George I. Forsythe
   Lieutenant General Eugene P. Forrester
   Lieutenant General Arthur G. Trudeau
   Major General William S. Biddle
   Major General Hugh F. Foster, Jr.

Tables of Organization and Equipment

Technical Manuals

U.S. Army Combined Arms Research Library, Fort Leavenworth, Kansas (CARL)
   Atomic Field Army Files
   Division Organization Files
   Pentana Study Files
   Resident CGSOC Curricula Files

U.S. Army Communications and Electronics Command, Fort Monmouth, New Jersey
   Signal Corps Archives
      Dr. Hans K. Ziegler Papers
      Signal Corps R & D Technical Reports
      Signal Corps Engineering Laboratories Journal

   Signal Corps Engineering Laboratories R & D Summaries

   Semiannual Signal Corps Status Reports

B. Books


C. Articles and Interviews.


Worthington, F.L. “What the Platoon Leader Would Like to Say to His Battle group Commander.” Student Paper, Command and General Staff Officer Course, Command and General Staff College, Fort Leavenworth, Kansas, 17 January 1958.

D. Government Documents


SECONDARY SOURCES

A. Books


219


B. Articles, Dissertations, and Presentations.


