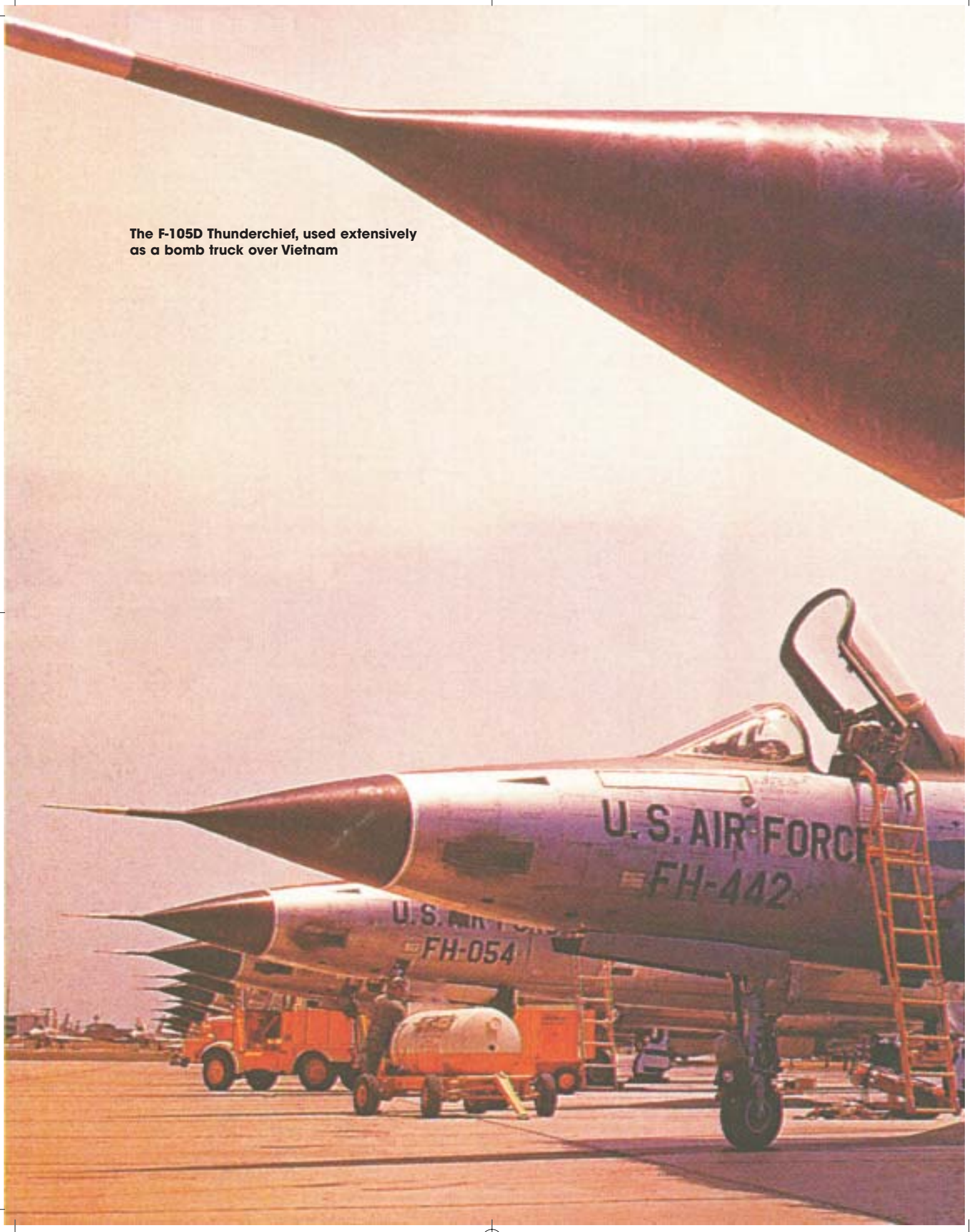

The F-105D Thunderchief, used extensively as a bomb truck over Vietnam

Prejudicial counsel:

Part one of

A Multidimensional Study of Tactical Air Power between the Vietnam and Korean Wars

By Major R L Banks USAF

CHAPTER 1

The Vietnam War was expensive in both human and material terms, and the USAF's failure to 'win' in Vietnam left a legacy unaltered until the Persian Gulf War almost twenty years later. Much of the criticism levelled at the Air Force since Vietnam has focused on decisions of senior leaders in the aftermath of World War Two, which allegedly left the Air Force unprepared for a limited war using tactical aviation. Is this an accurate assessment? Did the Air Force consciously and deliberately degrade its tactical airpower between World War Two and Vietnam? I shall examine decisions made between 1953 and 1961, determining whether and to what extent the US Air Force indeed neglected tactical airpower between Korea and Vietnam.

A wrecked US Skyraider in Vietnam

The United States lost over 58,000 personnel and i nvested over 150 billion dollars in the Vietnam War, but failed to achieve the objectives of countering communist aggression and ensuring the sovereignty of the South Vietnamese government

Carl von Clausewitz's often-repeated axiom 'war is nothing but the continuation of policy with other means' is as true today as two centuries ago.[1] Political objectives have governed military campaigns and have often set the stage for success or failure. America has experienced both competent and inferior policy to influence the outcome of military campaigns, and Vietnam remains the most recent example of the latter.

Poor policy is but one reason why Vietnam represents the nadir of military (and specifically, US airpower) effectiveness. Inadequate command and control, fighter aircraft, munitions, and tactics at the onset of Operation ROLLING THUNDER, all degraded the effective application of airpower in this limited conflict.

In November 1961, the USAF deployed 154 men and sixteen aircraft to Bien Hoa Air Base in South Vietnam to support and train the South Vietnamese Air Force (VNAF).[2] This was the beginning of a gradual five-year increase in deployment and intensity of operations in the Southeast Asian conflict. This 'gradualism' was partly instrumental in ultimate US military withdrawal and the fall of Saigon in June 1975. The United States lost over 58,000 personnel and invested over 150 billion dollars in the Vietnam War, but failed to achieve the objectives of countering communist aggression and ensuring the sovereignty of the South Vietnamese government.[3]

The USAF employed an impressive number of munitions and aircraft, but the outcome was far from ideal. Eight million tons of munitions fell on Southeast Asia between 1962 and 1972, over half on South Vietnam. Over two million were dropped on Laos,[4] and fewer than one million over North Vietnam. Of those eight million tons, 80 percent were dropped by the Air Force. Most of those bombs were general purpose or 'dumb' bombs that fell on jungle targets and failed to prevent both the 'Tet' offensive in 1968 and the 'Easter' offensive in 1972.

That failure was not due to a lack of tactical airpower or conventional munitions. At the peak of Vietnam, the Air Force had one half of all its existing fighters in Southeast Asia.[5] The immense USAF effort in this 'limited' war suffered substantial loss. The Air Force lost 383 of its total F-105 inventory (833)[6] and, overall, lost 2,257 aircraft and more than 2,700 men. From the 625 aircraft lost in combat over North Vietnam, the Air Force rescued 358 men, had 49 men die, had 293 remain prisoners of war (POW), and listed 364 men as missing in action.[7] The Vietnam War was also the first war in which American pilots did not possess a decisive advantage in ratio of air-to-air kills.

The USAF's actions from 1953 to 1961 contributed to its preparedness to employ tactical airpower in Vietnam. In peacetime, military institutions speculate on future possible threats and conflicts. Fog and friction exist in peacetime as in war. To paraphrase Clausewitz: fog is the inability to perceive the essence of a situation and friction is the force that makes what appears 'easy' so difficult. The inability to pierce the fog of determining future threats and to overcome the friction in peacetime force procurement decisions limits the military capability to prepare for war. Adequate preparations in peacetime are as critical to reducing the loss of treasure and lives in wartime, as is the proper employment of military forces in wartime.

Therefore, in peacetime, USAF leadership must strive to correctly anticipate threat and potential conflict. They must develop and procure capabilities to contend with the widest possible spectrum of conflict: an evidently difficult process, but essential. It is also imperative that the Air Force implement a coherent policy from its analysis to mold airpower to meet the anticipated challenges. If incorrect analysis or overemphasis on one strategy occurs, they may be inadequately prepared for war.

Did the Air Force lack the tactical aircraft, conventional munitions, and training required to conduct a limited war?

Since the commencement of the Vietnam War, military historians and senior USAF leaders have lamented the unpreparedness of the Air Force in the early 1960s to wage a limited war employing tactical airpower (limited by the amount of force applied based on political restrictions imposed, number of assets and nations involved, and ends sought).[8] Is this accurate? Did the Air Force lack the tactical aircraft, conventional munitions, and training required to conduct a limited war? Moreover, did the United States Air Force impede the development and employment of tactical airpower during the years leading up to the Vietnam? To answer these questions, I will conduct a detailed examination of the USAF decision-making process used from 1953 to 1961.

I will answer the question: did the USAF properly develop and employ tactical airpower between the Korean and Vietnam Wars? In so doing, I will analyse the USAF decision-making process at three different, but overlapping levels.[9] The following chapter describes the strategic factors that shaped the years leading to up 'Pre-Vietnam' period. Chapter Three describes the first level of the analysis, Model I—systemic level examination of the Air Force decision-making process as it applied to satisfying United States political and military strategy and their impact on tactical airpower. Chapter Four focuses on the second level of analysis, Model II—the organisational level decision-making process within the Air Force regarding tactical airpower. Chapter Five describes the third level of inquisition, Model III—the senior Air Force leaders who influenced the direction of the Air Force programs and who advised the national command authorities. The final chapter concludes with a summary of the areas where the Air Force either advanced or impeded tactical airpower.

QUALIFICATIONS AND SIGNIFICANCE

I do not intend to discuss airpower as a coercive tool of diplomacy, nor its theory, nor even the political and military leadership's conduct in the Vietnam War about which much has been written.[10] Without a doubt, many restrictions on the application of airpower were in place during the war (primarily from the Gulf of Tonkin incident in August 1964 to the Tet Offensive in 1968). Rather, my intention is to analyse

An F-100 unleashes a bomb over Vietnam

Tactical Airpower is defined as the conventional (non-nuclear) combat capability that could contribute to defeat of an adversary's military strategy

the decision-making process within the United States Air Force as it related to the development and procurement of tactical, conventional airpower.

For my purposes, Tactical Airpower is defined as the conventional (non-nuclear) combat capability that could contribute to defeat of an adversary's military strategy. This conventional capability includes air superiority, aerial interdiction, close air support, tactical reconnaissance, but purposely not tactical airlift. Furthermore, I specifically avoid strategic (i.e., nuclear) bombers of the time. The terms 'tactical' and 'strategic' actually refer to a level of warfare, but in the 1950s 'tactical' referred to fighter and 'strategic' to nuclear long-range bombers. My purpose is to focus on 'tactical airpower' as it was considered then.

Proper peacetime planning is vital. First, we should understand the facts that led to 'America's Longest War' and the nadir of tactical airpower employment. Second, officers helping the development of military strategy or the procurement of airpower assets should understand both the strengths and weaknesses in the Air Force's 1950s decision-making process, learning lessons from mistakes made prior to Vietnam. Those lessons should be understood within their context, so that they are not misapplied. Third, historical questions can best be answered only by fully analysing the problem at multiple levels.

I have used a simple measurement to determine whether, during this period, USAF decision-making advanced or impeded the development and employment of tactical airpower. If an Air Force decision contributed to additions in or improvements to (1) tactical aircraft employed in a conventional mission, (2) conventional munitions (air-to-ground and air-to-air), or (3) tactics to deliver conventional munitions, then that decision would indicate that the Air Force was advancing tactical airpower, and vice versa.

In either case, the effects of the decision must be significant enough to apply to a majority of at least one particular tactical airpower mission. For example, the decision to switch from 50-caliber to 20 mm ammunition had only a minor impact overall and therefore would not be considered as an advancement. However, the decision to develop more and better precision-guided munitions for missions 'fragged' to destroy hard targets such as bridges would be considered an advancement in conventional tactical airpower. The context must always be kept in mind in determining just how an Air Force decision impacted on tactical airpower at the beginning of Vietnam.

CHAPTER 2

STRATEGIC CONTEXT

Events post-World War Two directly affected Air Force senior decision-making. This chapter describes strategic contextual post-War factors and the primary events in the Korean War[11] that influenced airpower's development during the 1950s. My purpose is to provide a general understanding of the dynamics that shaped the USAF decision-making process of the 1950s.

STRATEGIC CONTEXTUAL FACTORS PRE-KOREA

From the Japanese surrender in World War Two, the atomic bomb acquired extremely important strategic implications. For the USAF, the lesson learned from Hiroshima and Nagasaki was that a well-planned and well-executed strategic bombardment strike could force surrender. During World War Two, airpower theory was piloted by advocates of strategic bombardment who professed that the principal way for airpower to achieve critical effects was through strategic attack of a nation's vital industrial centres. These advocates opined that tactical airpower should support ground forces in times of dire need and that the bulk of airpower should be devoted to the strategic endeavour. Strategic bombardment could produce the quick and decisive results advocated by many of the early airpower theorists, such as Giulio Douhet and William 'Billy' Mitchell. Moreover, atomic weapons delivered by USAF 'strategic' bombers fit nicely into a post-World War Two American airpower theory and national security policy.

After German and Japanese defeat, US military drawdown occurred quickly as the populace was eager to return to normal. Rapid demobilisation shattered the Air Force. The Army Air Forces stood at 2,253,000 on V-J Day (14 August 1945), but only 303,000 by May 1947. Similarly, flying units fell from 218 combat-ready groups to two by December 1946.[12] The 1947 Department of Defense budget was a meager $14.4 billion compared to the 1945 World War Two budget of over $79.8 billion.[13] The Air Force received slightly more than one-third of the 1947 DoD budget (approximately $5.025 billion).[14] President Truman was adamant about maintaining the diminutive defense budget, his priority being to contend with US domestic issues anticipating no immediate military threat. That would soon change.

On 24 June 1948, Soviet forces blocked all surface access to Berlin from the Western zones of Germany, in an effort to force the allied powers out of the city. The Allied response was an aerial supply effort to ensure that Berlin would not starve. The Berlin Airlift succeeded in supplying over 2,325 million tons of food, fuel, and supplies into Berlin over fifteen months. The blockade of Berlin airlift also portended future US/USSR confrontations.[15]
By 1948, the Soviet Union had become the principal threat to the United States. It had not drawn down its forces in Eastern Europe, maintaining 175 divisions poised to attack.[16] The new NATO countries of

Large numbers of IL-28 Beagles served in Eastern Europe during the Cold war

By 1948, the Soviet Union had become the principal threat to the United States. It had not drawn down its forces in Eastern Europe, maintaining 175 divisions poised to attack

Western Europe and the United States possessed neither the financial nor political will to match this threat. The growing US atomic arsenal was thought to counterbalance Soviet conventional military power in Europe, and deemed less expensive than a matching conventional force. Additionally, atomic weapons fitted nicely into current airpower theory and doctrine. To Air Force leaders, the atomic bomb's destructive potential supported the theory that a strategic attack at the commencement of hostilities could decide a war's outcome prior to mobilisation of surface forces. USAF war plans continued to envisage the striking of 'essential' elements of an enemy's economy similarly to World War Two. It was understood that, although atomic destruction would inevitably be wider, population centers would not be primary targets.[17]

Limited by a $14.4 billion defense budget, the USAF sought to define a decisive mission. In December 1948, it established Continental Air Command (ConAC), to include Air Defense Command (ADC) and Tactical Air Command (TAC). In conjunction with Strategic Air Command's (SAC) forces, the Air Force believed it was ready for any external threat. Its mission was:

'(a) initially, to launch a powerful air offensive designed to exploit the destructive and psychological power of atomic weapons against the vital elements of the Soviet war-making capacity.
(b) To provide on an austerity basis for the air defense of the United States and selected base areas.
(c) To provide the components necessary for the advancement, intensification, and/or diversification of our initial offensive until forces generated from inadequate mobilisation bases have become available."[18]

The USAF used the 'atomic' mission to fight for a larger share of the DoD budget and the procurement of the B-36 Bomber. In 1947, it only had 27 B-29 bombers capable of delivering atomic weapons,

The B-36 force could be 'capable of attacking any target in Eurasia from bases in the United States and returning to points of take-off'

which were larger and heavier than non-atomic munitions. According to the Commander of SAC, General Curtis LeMay, the B-36 force could be 'capable of attacking any target in Eurasia from bases in the United States and returning to points of take-off.'[19] Development of the B-36 would obviate the need for overseas bases.

A heated debate ensued between Navy and Air Force about the B-36. The Navy detected an opportunity to acquire a piece of the atomic 'pie' by developing the first flush-top 65,000-ton carrier to launch and recover heavy, multi-engine atomic bombers. The Air Force viewed this as an infringement on its mission of strategic bombardment. In 1949, Secretary of Defense Louis Johnson cut the USS United States, five days after its keel was laid.[20] A 'revolt of the admirals' followed, in which the Navy charged senior Air Force leadership with conflict of interest in the procurement of the B-36. Secretary of the Navy Sullivan resigned in protest. The Navy's charge was ultimately found baseless by the House Armed Services Committee and caused the removal of the Chief of Naval Operations, Admiral Denfeld.[21]

SOVIETS, ATOMIC WEAPONS, AND THE USAF

In 1949, the United States' monopoly on atomic weapons was broken. High levels of radio-activity over the North Pacific[22] revealed that the Soviet Union had detonated its first atomic bomb and had joined the arms race. US atomic weapons were now not only a conventional deterrent, but essential to destroying Soviet atomic capability. A robust atomic capability was now needed to deter potential Soviet atomic

Soviet possession of atomic weapons now furthered the USAF's push for more bombers and atomic weapons

attack, and the Air Force's strategic bomber force would quickly fill that role.
Despite its strategic mission, the USAF remained aware that strategic bombardment might not win wars alone. USAF Chief of Staff General Vandenberg testified:

'Lest this statement be again tortured into a declaration that strategic bombardment can win war alone, let me restate my belief that if a future war comes ultimately it must be concluded on the ground, like most of the wars of the past. But it is the objective of the strategic bombardment program—an objective which has been proved in battle—so to weaken the sustaining sources of enemy troops that they can be defeated in less time at less cost.'[23]

General Vandenberg understood that, although strategic atomic bombardment was the mainstay of deterrence, tactical airpower was also necessary for success once hostilities commenced. Unfortunately, the DoD budget could not allow sufficient numbers of both strategic bombers and tactical fighters. The Air Force made the choice based on the 'worst case' threat scenario—a Soviet attack into Western Europe for which US atomic weapons were necessary to offset the perceived military imbalance. Soviet possession of atomic weapons now furthered the USAF's push for more bombers and atomic weapons.

THE IMPACT OF A DECLINING DEFENSE BUDGET

In 1949, a proposed 70 groups were cut back to 48, seriously degrading USAF capability to support ground forces. F-80, F-84, and F-86 fighter aircraft were to be the primary US tactical jet fighters, and cancellation occurred of 51 B-45 light bombers, 118 F-93 fighters, and 30 C-125B assault transports, freeing-up approximately $270 million[24] for the purchase of 32 additional B-36s and 7 RB-36s and to modifying existing B-36s with jet engines. Also, senior Air Force leaders accepted the B-52 as the follow-on replacement for the B-36. The F-86 would remain the best interim fighter for the foreseeable future.

In 1950, President Truman ordered a review of political and military strategy in light of the new Soviet atomic threat. The National Security Council (NSC) recommended (NSC68) an immediate build-up of military strength to deter Soviet aggression and general war,[25] estimated at $50 billion per year for the next several years. Truman disagreed, and attempted to limit the military budget to $15 billion (1951) and $13 billion (1952). Assessing the threat, General Vandenberg ensured priority of funding for the strategic bombers to the detriment of tactical airpower. The budgetary dilemma became a moot point when North Korea invaded South Korea: much more than $15 billion would be needed. By 1953, the DoD budget would swell to $43 billion, with the Air Force share $15 billion.[26]

The United States were unprepared for the Korean invasion of June 1950, declaring that the Republic of Korea (ROK) lay outside their sphere of military influence

American tactical airpower was crucial during the Korean War. Close air support (CAS) was provided to retreating US and ROK ground forces, and the Pusan perimeter was held

THE STRATEGIC CONTEXTUAL FACTORS: THE KOREAN WAR

The United States were unprepared for the Korean invasion of June 1950, declaring that the Republic of Korea (ROK) lay outside their sphere of military influence. The Air Force possessed forty-eight aircraft wings and 411,000 personnel.[27] With no DoD war plans for Korea, the USAF scrambled to rush fighters (F-51 and F-80) from Japan to support the US and ROK ground forces that were retreating to Pusan. Many Americans were unsure of US interests in Korea, but at the senior US government level and within the Joint Chiefs of Staff (JCS), most felt that the North Koreans had to be stopped.

To fight the North Korean act of aggression, America was forced to exceed the NSC recommendations. In July, Secretary of Defense Johnson approved an increase of ten more combat wings and 50,000 additional personnel for the Air Force.[28] The President next agreed an increase to seventy-one wings by June 1951,[29] and shortly afterwards the JCS agreed an expansion to 143 wings, with over half directed to the strategic air offensive.

Many senior US State and Defense officials believed that Korea was a distraction and that the real war – the Soviet invasion of Europe – was imminent. The Air Force therefore conserved its vital assets (atomic-capable B-29s and B-36s) for Europe, which limited its forces in Korea. Likewise, US strategy was also limited in that the only politically acceptable targets for airpower were in Korea. Concerned about escalation to a global war, President Truman restricted the use of airpower to the Korean peninsula and prohibited attacks into China.[30] For the Koreans, the war was not limited—it was an all-out, total war for Korean unification, and the United States' war objective was to halt communist aggression and re-establish the status quo ante border. During this struggle, US and NATO forces were on alert for Soviet aggression in Europe.

TACTICAL AIRPOWER USE

American tactical airpower was crucial during the Korean War. Close air support (CAS) was provided to retreating US and ROK ground forces, and the Pusan perimeter was held. Tactical fighters and B-29 bombers prepared the area surrounding Seoul for General MacArthur's amphibious assault at Inchon. They bombed Seoul's airfield, and cut North Korean supply-lines. Tactical airpower was essential in securing Seoul and assisting the offensive drive north of the 38th parallel. After Inchon, US war objectives changed to pushing North Korean communist forces out of Korea and reunifying the peninsula. Chinese counter attacks across the Yalu River drove the allies back south across the 38th parallel. Again, tactical aircraft proved invaluable to the retreating ground forces. The US war objectives changed again to now containing the Chinese forces and re-establishing the original border at the 38th parallel.

US Far East Air Forces (FEAF) tactical aircraft such as the F-51, F-80, F-84, and the B-26 initially flew CAS sorties from bases in Japan until secure airfields were established on the Korean peninsula. Aided by slow-moving target-spotting T-6 'Mosquito' aircraft, they were directed in for the attack. Being air defenders, the FEAF fighter pilots were untrained in the CAS role[31] and, by the end of 1950, 18 aircraft had been lost.[32] This lack of training significantly impeded the success of CAS operations. The US Marine Corps achieved dramatically better results in CAS missions: 70 percent of them were World War Two CAS veterans. Poor Air Force performance led Major General Weyland, a tactical air expert who had supported Patton's Third Army in Europe during World War Two, to institute changes in CAS procedures that resembled doctrinal procedures established in World War Two. Improvements resulted, and by the war's end, FEAF aircraft had flown 57,665 CAS sorties with results resembling thos of the Marines.[33]

Next, Weyland shifted Air Force emphasis to interdicting North Korean and later Chinese supply lines. With few air assets in theatre, it was difficult for the FEAF Commander, Lt General Stratemeyer, to achieve meaningful results without consolidation of all United States air assets to ensure unity of effort of available forces. There were three different services operating aircraft independently in Korea: FEAF (USAF), a Marine Air Wing (USMC), and Task Force 77 (USN).[34] Each service demanded control of its own air assets, preventing unified command (one of the central tenets of airpower doctrine). Regardless of command and control problems, the Air Force focused on stopping the flow of enemy and their supplies to the front. Drawing on World War Two experience, Air Force leadership was again trying to find a decisive application of airpower to quickly bring the war to an end with less loss of treasure and men. Having already attacked all the strategic targets in North Korea, the FEAF sought to cut the enemy's logistical lines of communications from China. Interdiction proved invaluable during the strategic retreat from the Yalu, providing much assistance to the outnumbered allies, but after stagnation along the 38th parallel was less so, because North Korean and Chinese ground forces needed little support from the northern supply lines. The US had wrongly supposed that the enemy needed war-sustaining materials comparable with their own, and interdiction failed to overcome a redundant Chinese supply system reliant on terrain, camouflage, and seemingly endless reserves of personnel to repair damage and transport supplies.[35] The operation failed to cut the enemy's supply line, and failed to end the war. This incorrect perception would haunt the United States more than a decade later in Vietnam with similar results.

The arrival of Soviet MiG-15s contested USAF air superiority without which surface forces were vulnerable, and contributed to the failure of the interdiction campaign. USAF air defense F-84s and Navy F9Fs were no match for the MiG-15, but US air superiority was largely regained with the arrival of the F-86.

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The MiG-15s operated by North Korea were supplied by the USSR and flown by Soviet pilots

As it was, the MiG's poor range posed little threat to allied ground forces, but US bomber missions deep into North Korean 'MiG Alley' told another story. The F-86 was designed, not as a day air superiority fighter, but a multi-purpose fighter-bomber. Although similar in performance to the MiG-15s, the F-86s achieved an impressive kill-ratio of 10:1 over the MiGs[36] owing to better training, more experienced and aggressive pilots, better tactics, and hydraulic assisted flight controls to assist maneuverability. Unfortunately for the American airmen, the MiGs arrived in much larger numbers, overwhelming the air superiority aircraft assigned to protect the bombers.[37] US air superiority over the front and in South Korea was absolute (supremacy), but over the northern part of North Korea where the interdiction campaigns were conducted it was questionable.

Many of the classic 'counterair' targets, such as airfields, were beyond the Yalu River in China and were off limits to the FEAF pilots. US pilots wanted to attack the MiGs on the ground in order to eliminate the air threat once and for all. Fearful of escalating the war further and involving the Soviet Union, President Truman restricted the employment of airpower across the Yalu River and on such lucrative targets, permitting an environment in which the Soviet Union continued to provide MiGs to the Chinese without interference. With more MiGs, the Chinese exacted a tremendous toll on FEAF bombers. The FEAF lost 57 B-29s—a figure so high that Air Force leaders curtailed B-29 operations in or near MiG Alley.[38]

The Korean War witnessed technological innovation for air combat. First used in World War Two, chaff (tiny strips of aluminium cut to interfere with radar waves) was employed extensively: large bundles (chaff clouds) masked both fighters and bombers from surface radars that directed anti-air artillery. Unfortunately, restrictions prohibited the FEAF aircraft from employing chaff until 1951, limiting its overall effectiveness.[39] Second, SHORAN (Short Range Radio Navigation) was successfully used to

Unfortunately for the American airmen, the MiGs arrived in much larger numbers, overwhelming the air superiority aircraft assigned to protect the bombers

aid aircraft to attack invisible ground targets. Both at night and in poor weather, SHORAN assisted FEAF fighters and bombers in interdicting Chinese and North Korean surface targets.[40] Third, American aircraft began carrying IFF (Identification: Friend or Foe) transponders, enabling them to distinguish hostile aircraft. Fourth, ECM (electronic counter measures) were available and sparingly used against enemy radars. Their use was limited in case Soviets learned about them and developed counter-measures to them (ECCM), which might negate the American strategic bombers' capability to penetrate Soviet airspace if such a need arose.[41] Technological innovation gave the USAF the edge in a complex, limited war.

NUCLEAR OPTIONS

When the Chinese pushed south in mass, the President Truman contemplated the use of atomic bombs, prompting a visit by British Prime Minister Clement Attlee to the White House.[42] Attlee echoed the views of many world leaders that atomic weapons might provoke the Soviets into war on the side of the Chinese: a similar atomic response from the Soviets could launch World War Three. President Truman responded to Attlee's visit by announcing that only the President could authorise the use of atomic weapons, thus comforting the world with the belief that this limited war would not escalate into total war.

The stalemate at the 38th parallel and the Korean War in general were contentious issues in the 1952 presidential race. Dwight D. Eisenhower won with the promise of a balanced budget and an end to the Korean War. Frustrated with fruitless negotiations, and seeing mounting casualties, Eisenhower secretly threatened China with atomic attack;[43] unlike many military leaders, he did not believe an atomic war with the Soviets likely. Stalin died in March 1953, and Eisenhower persuaded China to sign an armistice in July.

LESSONS LEARNED FROM THE WAR

On cessation of hostilities, the USAF began to analyse the war for lessons learned. America had over 34,000 personnel killed in action and 105,000 wounded. FEAF had flown 720,980 sorties delivering 476,000 tons of ordnance against the enemy, losing 1,466 aircraft and suffering 1,729 casualties: dead, wounded, and POWs.[44] Unprepared, unequipped, and untrained for a massive air support operation, the Air Force had relied on World War Two experience and helped to stop communist aggression on the peninsula. Despite political constraints, airpower had contributed significantly to the outcome.

Air superiority was shown to be absolutely necessary: military success could not be achieved without it. Unfortunately, the Air Force walked away from Korea believing that its multi-role fighter was an adequate platform for air superiority, if employed in sufficient numbers. The F-86, even though not designed as an air superiority fighter, proved highly effective against Soviet air threats.

On the air-to-ground side, strategic bombardment, interdiction, and close air support produced mixed lessons. Political restrictions on bombing meant that truly lucrative targets escaped attack and no real lessons emerged. Many USAF leaders believed Korea was an aberration of the kind unlikely to occur again;[45] nevertheless, close air support provided lessons to be learned no matter where the next war would be. Anytime ground forces were employed against an enemy, tactical airpower would be required to support the Army. In Korea, CAS proved highly effective and essential to ground commanders, although the Army believed the support inadequate. Later CAS exercises confirmed this—lack of adequate numbers, timeliness of strikes, and poor communications. The Army wanted Air Force pilots as

FACs, but the Air Force needed them to fly, even cancelling the Mosquito system of air direction in order to focus on strategic missions.[46]

Several interdiction lessons emerged. First, SHORAN could get aircraft to the general target area, but at night and in adverse weather was insufficiently accurate to allow the precision found in visual attack. Second, ECM technology could not prevent optically fired surface-to-air guns from hitting FEAF aircraft. Moreover, US tactics forced them into the heart of the anti-aircraft artillery (AAA) engagement envelope. Precision-guided bombs delivered from outside the AAA threat envelope were far from accurate, and their use unpopular. Third, a pilot's experience was crucial to success. Near the end of the war, experience levels dropped because of rotation of pilots back to the States and a lack of a training program to replace them.

Despite the restrictions imposed, the Air Force believed overall that it had accomplished its mission. Some USAF leaders believed that those restrictions prevented the proper application of airpower,[47] and that the US should avoid future limited conflict with restrictions. Other USAF leaders were satisfied with airpower's achievement in Korea, with F-86s for air superiority and F-80s, F-84s, and T-6s for close air support, although success of the interdiction campaign was contested. USAF leaders were content that FEAF had held the Chinese to the 38th parallel, and did not feel compelled to change anything. Historians have pointed out though, that the Air Force had failed to achieve its primary goal of evicting the communists from the peninsula or its subordinate goal of preventing a Chinese offensive at the 38th parallel. USAF leaders failed to realise was that the armistice was due less to airpower, and more to strategic events (Eisenhower's nuclear threat and Stalin's death). In all probability, Chinese agreement to the armistice was due to the achievement of a political objective—preservation of North Korea.[48]

THE STRATEGIC CONTEXTUAL FACTORS: POST KOREAN WAR

After Korea, President Eisenhower stated that the US would never again be tied down in such a war;[49] there would be no future restrictions. He believed that nuclear weapons were now the weapons of choice. In 1953, he told the NSC, *'Our only chance of victory, would be to paralyse the enemy at the outset of the war…If war comes, the other fellow must have started it. Otherwise we would not be in a position to use nuclear weapons, and we have got to be in a position to use that weapon…'*[50] The Korean War had forced him to take a 'new look' at US military strategy and requirements, re-evaluating mission and force posture.

After Korea, the USAF possessed 106 active wings, but only 93 were considered operational.[51] While the JCS studied the world situation, they were given an interim level of 120 wings to replace the 143-wing objective. As they studied the Korean War and contemplated the next conflict, many USAF leaders believed that a future war would not have the Korean luxuries of air superiority, strategic bombers conducting interdiction missions, and the freedom of the seas: Korea had been an anomaly. The USAF Secretary wrote in 1955, 'The Korean War was a special case, and airpower can learn little from there about the future role in United States foreign policy.'[52] Again the US military establishment focused largely on a single Soviet threat and nuclear weapons to contain that threat.
As the US military made post-war preparations, the Eisenhower administration was already looking at the limited conflict in French Indochina, a conflict that would plague the United States a decade later as Vietnam. The 1950s would see confrontations in Lebanon, Formosa, and Berlin. We can now see that Korea was less of an aberration than was thought. Tactical airpower achieved mediocre success in Korea and would be underemphasized in the decade that followed. Just how underemphasized and to what extent is the focus of the remainder of this study.

CHAPTER 3

MODEL I ANALYSIS: US TACTICAL AIRPOWER FROM 'NEW LOOK' TO 'FLEXIBLE RESPONSE'

Taking office in 1953, President Eisenhower, a former Army general, changed the national security policy drastically. Striving for a balanced federal budget and 'no more Koreas', he halted the growth of the Department of Defense (DoD) spending.[53] Tactical airpower would be severely cutback over the next eight years for reasons I shall explain using Allison's 'Model I' framework. Areas of examination include the national security policy, national military strategy, and decision-making process in the development and procurement of tactical airpower during the 1950s.

MODEL I DECISION-MAKING

What determines force structure? Historians have linked objectives to doctrine. If a state has an objective, then a particular doctrine will lead to a quantifiable force structure necessary to achieve that objective. If the Soviet Union desired to conquer the world or Europe, then given its established military doctrine, a large and specific type of military force would be necessary to defeat its foes and occupy the land sought. Oftentimes it appears logical to proceed in this fashion in an effort to explain why a country possesses the forces it does. Many historians have stated that a country makes its decisions as if it were a unitary (that is a single entity with one voice), rational actor. According to Allison, the rational actor (the state in this example) is faced with alternatives or courses of action and tends to choose the alternative that maximises value within specified constraints. 'In economics, to choose rationally is to select the most efficient alternative, that is, the alternative that maximises the output for a given input or minimises input for a given output.'[54] In the Soviet example, the force posture selected would be based on a value-maximising decision-making process to achieve its strategic objectives, which would fall within Soviet doctrine.

According to Allison, the concepts of the rational actor model include: 'Goals and Objectives,' 'Alternatives,' 'Consequences,' and 'Choice.'[55] When facing a decision or problem, the rational actor will place some 'value' or 'utility' on the outcome of the goals and objectives it desires. Through the decision-making process, the actor will accumulate alternative courses of actions and rank them according to their value or consequence. Rational choice consists of simply choosing the best alternative. If a nation decides upon a particular course of action, then it must have had some desired end toward which the decision constituted a maximising means. If the Soviet Union's objective was to conquer Western Europe, then in keeping with Soviet doctrine, the USSR might wish to position a massive ground force in Eastern Europe. If the Soviets were concerned about United States intervention, then some additional force structure may be required (strategic nuclear weapons) in order to deter the Americans from interfering with Soviet objectives. From a Model I perspective, only the most efficient alternative (from the Soviet point of view) would be chosen to meet its objectives. Other alternatives that did not appear to be as efficient would be discarded.

I will now apply Allison's Model I approach to analysing America's decision-making process to establish why the US force structure, as it pertained to tactical airpower, was postured the way it was at the start

of the Vietnam War (1961). A Model I analysis assumes that the United States was a unitary rational actor that possessed a specific national security policy, which drove its national military strategy selection. This, in turn, dictated a variety of alternative courses of action, which led to a value-maximising choice. From this military strategy choice, a Model I analysis may explain why tactical airpower evolved as it did.

US NATIONAL SECURITY POLICY DURING THE '50S

In September 1950, the NATO Military Committee requested a conventional force build-up to counter the extensive Soviet conventional forces positioned in Eastern Europe (175 divisions). The desired NATO goal was 96 divisions and over 4,000 aircraft, with United States Air Forces Europe (USAFE), at the time possessing 2,100 aircraft and 16 wings, expanding to 28 wings.[56] However, when Stalin died in 1953, several European countries backed away from the ambitious goal and focused their attentions on internal economic affairs.

As previously noted, President Eisenhower likewise favoured a smaller military to alleviate some of the US economic burdens arising from the Korean War. In the President's first State of the Union address to the Congress in 1953, Eisenhower stated that his foreign policy recognised that no single country alone, even the United States, could defend the world against communist aggression. He intimated that the United States and its allies should rely on 'mutual security' and 'mutual co-operation' to overcome the financial burden of this tremendous task.[57] Eisenhower thus posited that fewer US forces would be needed overseas, reducing the strain on the military force structure. Less military spending meant more domestic spending. There must also be a balance between a strong military and economic growth. He went on to state:

> *Our labor for peace in Korea and in the world imperatively demands the maintenance by the United States of a strong fighting service ready for any contingency. Our problem is to achieve adequate military strength within the limits of endurable strain upon our economy. To amass military power without regard to our economic capacity would be to defend ourselves against one kind of disaster by inviting another.*[58]

In April 1953, Eisenhower presented to Congress his plan concerning the reorganisation of the Department of Defense, stating that the United States was not a 'military-minded' nation and had not been properly prepared for the outbreak of war (both World Wars and Korea).[59] He went on to say:

> *We in the United States have, therefore, recently embarked upon the definition of a new, positive foreign policy. One of our basic aims is to gain again for the free world the initiative in shaping the international conditions under which freedom can thrive. Essential to this endeavor is the assurance of an alert, efficient, ever-prepared defense establishment…These simple facts make imperative the maintenance of a defense commanding the most modern technological instruments in our arsenal of weapons*[60] *(emphasis added).*

The 'most modern technological instruments' referred to were nuclear weapons. Unlike Truman, Eisenhower considered them an integral part of the military arsenal. His reliance on nuclear weapons to justify cutbacks in expensive conventional military capability was the foundation of his international policy, the 'New Look.'

The basic planning document for the New Look was titled National Security Council (NSC) 162/2, which the president approved in October 1953. 'NSC 162/2 began by defining a twofold central national

security problem: (a) to meet the Soviet threat to U.S. security; and (b) in doing so, avoid seriously weakening the U.S. economy or undermining its fundamental values and institutions.'[61] NSC 162/2 focused on the Soviet Union as the primary threat, although potentially 'other communist' countries (e.g., China) were not excluded. NSC 162/2 capitalised on Eisenhower's desire to rely on nuclear weapons for deterring the communist threat. It stated, 'in the event of hostilities the United States will consider nuclear weapons to be as available for use as other weapons.'[62]

In short, nuclear weapons were to be the primary means of deterring communism. Furthermore, by greater reliance on its allies, the US could continue to divert its precious dollars on domestic issues and not on a larger military infrastructure. Procuring nuclear weapons and their delivery platforms (strategic bombers) would be significantly less expensive than the large conventional force NATO had requested in 1950. NSC 162/2 accurately predicted that both super powers would engage in a nuclear arms race, but the US had to maintain its lead to deter the Soviets from general war. If the worst happened, the United States would win with a 'massive retaliation.' Furthermore, it was postulated that if massive retaliation could deter nuclear war, then nuclear weapons would also deter forms of war less than total nuclear war.[63]

US MILITARY STRATEGY

In January 1954, US Secretary of State Dulles presented 'Massive Retaliation' as the new military strategy for the United States, becoming synonymous with New Look. Dulles indicated that instant, massive, nuclear retaliation would be applied to the existing strategy of deterrence. Massive Retaliation would give the United States the initiative in any future conflict by allowing America to choose the means, the time, and the place of retaliation.[64]

As in World War Two, the United States' focus internationally remained a 'Europe first' strategy. US leaders believed that, short of a direct attack on the continental United States, an invasion of Europe was the worst threat to American security. Holding the permanent position of Supreme Allied Commander Europe (SACEUR), America would always be extremely influential in NATO affairs. Unsurprisingly, NATO followed in America's footsteps. In December 1954, the NATO Military Committee (MC) formulated its equivalent to NSC 162/2—MC 48, which encapsulated NATO's nuclear doctrine, stating that NATO would use nuclear weapons at the commencement of hostilities with the Soviet Union whether or not the USSR used them first.[65] If and when future minor border skirmishes with the Soviet Union escalated, then NATO was to retaliate with the full weight of its nuclear arsenal. There was no concept of 'limited war' with the Soviet Union. NATO's conventional force, therefore, was a 'trip-wire' to compel the start of a general nuclear war should the Soviets launch an offensive in Europe.

'DROPSHOT'

Plan 'DROPSHOT' was the United States' secret war plan against the Soviet Union, evolved from the Truman Administration in 1949. Designed by the JCS, DROPSHOT assumed for planning purposes that nuclear war would break out in January 1957 and that America's first course of action would be to deter Soviet aggression.[66] According to the plan, it was vital that the Soviets understood that any attack against the US or its allies would require an immediate nuclear response. They should expect the risk of general nuclear war if the slightest infringement upon friendly nations occurred. If war did occur, then in co-operation with its allies, a solidly postured US military would defeat the 'Communist-dominated armed rebellions.'[67] The plan did not specify if 'rebellions' included USSR support for wars of liberation, but the wording of the plan suggests that the authors intended to contain Soviet aggression at all levels of conflict with nuclear weapons.

Bombing missions were intended to be a one-time mission (sometimes a one-way trip) that relied on electronic means to distract Soviet air defenses

DROPSHOT called first for the defense of the Western Hemisphere and European Allies. If war broke out, the allies were to destroy the Soviet Union's will and capacity to resist by launching a powerful nuclear air offensive in Western Eurasia.[68] Next, friendly forces were to launch a discriminate containment plan totally encircling the Soviet Union, secure strategic areas and bases, secure sea lines of communications, and wage political, economic, psychological, and underground or guerrilla warfare. Lastly, the plan called for launching 'co-ordinated offensive operations of all arms against the USSR as required.'[69]

A preventive nuclear attack was preferred, but regardless of which country attacked first, the nuclear air offensive was designed to simultaneously strike varying parts of the Soviets' war-making capability. Target selection was similar in philosophy to that of World War Two air planners except that enemy's nuclear capability was now targeted. According to the DROPSHOT's planners, the most important targets for strategic airpower were:

> (a) Stockpiles of weapons of mass destruction, and facilities for their production; (b) Key government and control facilities; (c) Urban industrial areas (d) Petroleum industry; (e) Aerial mining against sub marines; (f) Submarine bases; (g) Transportation system; (h) Aircraft industry; (i) Coke, iron, and steel industry; and (j) the electric power system.[70]

Tactical Airpower's Role

With the emphasis on nuclear weapons in national security and military strategy, DROPSHOT planners gave only a minor part to conventional tactical airpower. It would be needed for air superiority in the defense of both the US and Western Europe, and it was critical to DROPSHOT's success that Soviet strategic airpower did not penetrate US and NATO air defense. Within Europe, there was a limited role for ground attack missions in the event of Soviet invasion. The planners saw little point in planning for such occurrences since the initial air offensive was to be nuclear. There would be little for tactical airpower to attack after a nuclear strike.

Despite the lessons learned from World War Two and Korea, escort of long-range bombers was discounted as a mission for fighters.[71] Bombing missions were intended to be a one-time mission (sometimes a one-way trip) that relied on electronic means to distract Soviet air defenses. Besides, to be effective as a war strategy, nuclear bombardment did not need the 100 percent success of its bombers. During war gaming, DROPSHOT planners concluded that approximately 70 percent of the bombers would get through Soviet defenses.[72] This figure was acceptable to guarantee success of DROPSHOT. More importantly, fighter escorts lacked the range to escort bombers great distances.

Despite this, tactical airpower did flourish as a means of delivering tactical nuclear munitions. Perfected in the early 1950s, tactical nuclear munitions were smaller and less destructive than the nuclear bombs employed by strategic airpower, consisting of the development of tactical nuclear artillery, rockets, and missiles for battlefield use.[73] US tactical airpower could now contribute to the New Look strategy through the employment of tactical nuclear munitions in Europe.

As a result, tactical nuclear airpower grew while tactical conventional airpower remained virtually unchanged since Korea. During the 1950s, the Air Force developed several fighters that contributed to America's military strategy. The F-84 and F-100, along with the F-86, were the only multi-role fighter-bombers designed for the conventional role throughout the 1950s (and the early 1960s for the F-100).74 Others were developed for nuclear or nuclear-related missions: fighter-bombers such as the F-101C, F-104C and G, and the F-105 were developed, and envisioned to augment the war plan's use of strategic bombers, delivering a tactical nuclear payload and returning at high speed. Thenceforward,

F104Cs

Fighter-bombers such as the F-101C, F-104C and G, and the F-105 were developed, and envisioned to augment the war plan's use of strategic bombers, delivering a tactical nuclear payload and returning at high speed

the Air Force's Tactical Air Command (TAC) came to be known as a 'junior Strategic Air Command.'[75] To defend the United States against Soviet strategic bombers, aircraft such as the F-102, F-104A, and F-106 were created, without excessive agility. For reconnaissance, the F-100 and F-101 were modified to carry intelligence-gathering equipment.[76] Two remaining tactical fighters employed in Vietnam, the F-4 (navy-developed) and the F-111, were either modified or developed for USAF use after 1961.[77]

The Air Force posited that its tactical airpower, delivering tactical nuclear munitions, was instrumental in the achievement of national political objectives in Europe, finding favor within Eisenhower's approach of using the military efficiently to reduce military spending. Furthermore, the President and his military planners believed that tactical nuclear airpower 'represented both a psychological and physical contribution to the deterrence of Soviet aggression in Western Europe.'[78] This added mission would give the Air Force a larger share of the defense budget.

SPUTNIK AND THE RISE OF ICBMS

On 4 October 1957, the Soviet Union launched Sputnik I, the first man-made satellite in history. Chairman of the JCS, Air Force General Twining, stated the launching of Sputnik I was 'a shot fired which was both seen and heard around the world.'[79] A month later came Sputnik II, a 1,120-pound rocket that safely delivered a dog into orbit and back to Earth. The Soviets' success with missile technology 'created dismay everywhere outside the Iron Curtain.'[80]

The Soviets' success with missile technology ' created dismay everywhere outside the Iron Curtain

The launching of Sputnik proved the Soviets' lead in missile technology, raising fears of a nuclear delivery to America or Western Europe through space. Eisenhower and Congress increased funding to DoD and its intercontinental ballistic missile (ICBM) programs, which fell under both the Air Force and the Army. Missiles such as Atlas, Thor, Jupiter, and Titan evolved during this period. The net result in the Air Force was a greater emphasis on the strategic nuclear missions and a diminished concern for conventional tactical airpower. Throughout most of the 1950s and early 1960s, the Air Force possessed the largest percentage of the DoD budget (see Table 1). Tactical airpower's share of the Air Force budget dropped to its lowest level since 1948 (See Table 2), meaning that, on a systemic level, it could not advance compared to strategic airpower. Not until the early 1960s did the Air Force begin to increase funding to tactical airpower, primarily because of the doctrine of 'flexible response.'

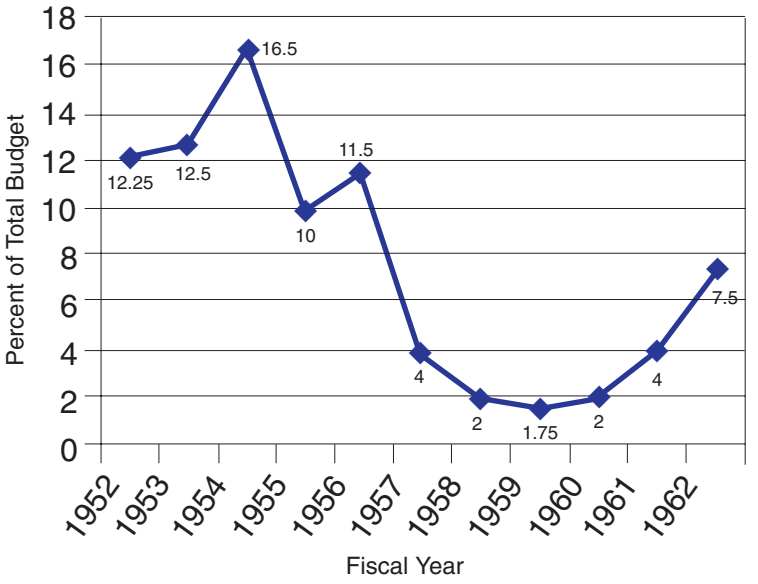
OBJECTIONS TO MASSIVE RETALIATION

In 1953, the United States possessed 1,000 nuclear weapons; by 1960 18,000, with megatonnage increasing more than twenty-fold.[81] Intelligence reports showed that the Soviets were reaching parity. During the 1950s, many notable figures discussed deterrence theory, credible second-strike capability, and mutual assured destruction (MAD). The critics' main objection to massive retaliation was its perceived lack of credibility. In 1954, Bernard Brodie questioned America's national security policy, doubting whether US would indeed launch a nuclear attack over a minor conflict.[82] Similarly, Henry Kissinger warned of the incompatibility of the New Look and limited war. Moreover, limited conflict around the world might increase. Even NSC 162/2 and DROPSHOT acknowledged that limited war was more likely with the Soviet Union. In the United Kingdom, Marshal of the Royal Air Force Sir John Slessor stated, 'We can take it as a foregone conclusion that our opponents, having decided that it will be too costly to overwhelm us by direct assault, will take every opportunity to turn or undermine our defenses by other means.'[83]

Fiscal Year	Army	Navy	Air Force	Defense Agencies	Total DoD	USAF Percent of Total DoD
1953	16,337	11,878	15,087	409	43,711	34.5%
1954	12,910	11,293	15,668	464	40,336	38.8%
1955	8,899	9,733	16,407	494	35,532	46.1%
1956	8,702	9,744	16,749	596	35,791	46.7%
1957	9,063	10,398	18,363	615	38,439	47.7%
1958	9,051	10,906	18,435	669	39,062	47.1%
1959	9,468	11,728	19,084	953	41,233	46.2%
1960	9,392	11,642	19,066	1,115	41,215	46.2%
1961	10,131	12,215	19,778	1,105	43,228	45.7%

Figures are in millions of dollars. Source: 'Expenditures, Summary by Service' *Department of Defense Fact Book, 1947 – 1978* (Washington D.C.: United States Government Printing Office,1978), 27).

TABLE 1. Department of Defense Budgetary Summaries:1953 - 1961



Source: 'A Study of Aviation Responsibilities: Air Force – Army, June 1962' United States Air Force Study located at United States Air Force Historical Agency, call number K143.043 - 5.

TABLE 2. Tactical Aircraft Production as a Percentage of Total Air Force Budget

Widespread doubts arose over the superpowers' intent to wage total nuclear war over minor national interests. Would one nation risk nuclear suicide over the invasion of one of its allies? French political leaders questioned whether the US would 'trade Lyons for New York' if the Soviets were to strike France with nuclear weapons. French General Gallois, and later French Presidents Mollet and de Gaulle, believed not,[84] and there was a lack of confidence in the United States' deterrence policy. America was betting that nuclear deterrence would discourage enemy military action (nuclear or conventional) by indicating that the risks and costs of nuclear war would outweigh territorial gains. If, however, a limited conventional confrontation was perceived by the Soviets as unlikely to evoke a US nuclear response, then massive retaliation would fail as a viable military deterrent strategy for the entire spectrum of conflict. The United States attempted to bolster confidence by placing intermediate range ballistic missiles (IRBM) in Europe to deter communist invasion.[85]

In 1955, senior US and NATO military leaders pressed for a greater number of conventional military forces to re-establish NATO's credibility of deterring non-nuclear aggression. In 1956, US Army Chief of Staff General Taylor presented an alternative strategy that provided for a flexible response based on varying degrees of confrontations along the spectrum of conflict, relying more on conventional forces to deter general war, defeat local aggression, and win a 'general war conducive to viable peace.'[86] General Taylor asserted that his concept applied to the entire Defense Department, not only the Army. His 'National Military Program, the title of a Strategy of Flexible Response' was envisioned to:

> *be flexible enough for ready adaptation to presently unforeseen and unforeseeable situations. would avoid dependence upon a single weapons system and upon a single strategic concept—the capital fault of the strategy of Massive Retaliation…Massive Retaliation offers only unlimited destruction with nothing beyond.*[87]

In the time of 'nuclear plenty,' General Taylor's strategy was not accepted and the New Look remained the United States' national security policy until 1961. Not until President John F. Kennedy's

Administration in 1961 did the strategy of Flexible Response supplement the strategy of Massive Retaliation.[88] One reason for continued reliance on Massive Retaliation was a perception of US leaders that the threat of nuclear response had a beneficial effect on limited confrontations that occurred in the mid-1950s. American involvement in the crises of the Suez Canal, Lebanon, and the Straits of Formosa all concluded with no major war with the Soviet Union and an outcome favorable for the United States. Had conflict erupted, USAF tactical airpower might not have been adequate or appropriate.

WAS TACTICAL AIRPOWER IMPEDED? A MODEL I ANSWER

To answer the question whether or not tactical airpower was impeded at a systemic level and why, Allison's Model I construct will serve as a guide to comprehending the United States' decision-making process. To recap, as a result of the decision-making process during the 1950s, the United States accumulated alternative courses of actions and ranked then according to their value or consequence. First, (preferably with their allies) they could adopt a strategy of Massive Retaliation with nuclear munitions (strategic and tactical) to deter both general and limited war. If deterrence failed, the communist aggressors would suffer nuclear devastation. Second, they could build a substantial conventional military force to augment a minimal nuclear force in order to counter Soviet belligerence across the entire spectrum of conflict. Third, they could develop a balanced force structure of credible nuclear and conventional capabilities to counter Soviet aggression likewise.

Each alternative had consequences, influencing America's decision to make a value-maximizing choice. The first alternative provided the United States with the greatest force possible (nuclear weapons) as a deterrent to Soviet hostilities and with the least financial burden to the US economy. Eisenhower's public statement of nuclear employment even in a limited war scenario may have deterred conflict. Regardless, his policy did balance the Federal budget.

The second alternative, in providing US decision-makers with a more credible conventional force against the 175 Soviet divisions on the East European border, resembled what NATO leaders were requesting in 1950 prior to Stalin's death. The absolute minimal nuclear force structure would offer some deterrence against the growing Soviet nuclear threat, but may not have represented enough weapons for a second strike in the event of a Soviet pre-emptive first-strike. The conventional part was costly, the nuclear less so. Sizeable conventional forces could certainly be based around the world to cope with flare-ups, but a war-weary American public would not favor having its sons and daughters stationed away from home.

The third alternative, proposed by General Taylor, was a compromise, presenting a balanced force structure to contend with the entire spectrum of conflict: sufficient nuclear weapons for a limited second-strike capability, and a conventional build-up to provide some level of credible conventional deterrence. This third alternative was more expensive than the first, but less so than the second. It offered the widest credibility of deterrence and war-fighting capability at a medium price, relying on credible force structures at both the nuclear and conventional levels to deter war and, if war erupted, to win quickly (whatever the level). History shows that the 'value-maximising' rational alternative chosen by US decision-makers was nuclear deterrence. President Eisenhower was determined to spend on domestic issues, and relying on nuclear weapons was financially responsible. Despite his statement of intent to use nuclear weapons in any conflict, it is much debated today whether American and NATO leaders would have actually employed nuclear munitions in a limited war scenario in the decade prior to

All USAF tactical aircraft were developed at the time for nuclear or nuclear-related missions...to the detriment of conventional tactical airpower

Vietnam. The Cold War over, it is impossible to prove that nuclear weapons deterred a nuclear war (it is difficult to prove a negative). Nuclear weapons likely contributed in some fashion to deterring nuclear war, but they did not prevent the escalation of hostilities that took place in Southeast Asia in the 1960s.

A Model I approach indicates that conventional airpower had only a minor role in US national political and military strategy during the Eisenhower administration. All USAF tactical aircraft were developed at the time for nuclear or nuclear-related missions…to the detriment of conventional tactical airpower. Although capable of delivering conventional weapons, these aircraft were not designed to be employed in a conventional war. Furthermore, munitions procurement was similarly steered toward tactical nuclear weapons. This disregard for conventional, tactical air missions (along with poor political guidance) contributed to the Air Force's poor performance early in Vietnam. Writing about Massive Retaliation, John English called the result of the United States' strategy a 'dangerous military legacy.'[89] His Model I view notes that America's reliance on nuclear weapons proved to be detrimental to conventional forces:

> *Essentially a cheap, quick, technological solution to a military problem, nuclear deterrence has itself become so encumbered with theoretical twists and esoteric spins that attempts to apply them in their various forms might actually do more harm than good. Instead of reflecting the essential unity of war fighting, deterrent theory focused military attention on the grand strategic plane to the neglect of operational and tactical dimensions. At the same time, it exerted a malign effect on traditional defense posture akin to that of a crutch, which encouraged maldeployments and the erosion of traditional military skills.*[90]

English presents the most common view of 1950s tactical airpower development. Further examination will provide alternative insights into the decision-making process for tactical airpower development prior to Vietnam.

CHAPTER 4

MODEL II ANALYSIS: AN ORGANIZATIONAL PERSPECTIVE

The previous Model I analysis indicated that conventional tactical combat airpower was neglected at the broad, upper echelon or systemic level within the USAF as a result of national security policy and military strategy. However, was it ignored below the systemic level? Most of its budget was devoted to the strategic nuclear mission during the 1950s, but did the Air Force, at various organisational levels, continue to develop and promote conventional tactical airpower post-Korea?

From World War Two through Vietnam, entities such as the National Advisory Committee on Aeronautics (NACA), the United States Air Force Scientific Advisory Board, the Air Materiel Command,

and the USAF Fighter Gunnery School, were responsible for developing and/or improving tactical combat airpower. Although poorly funded, tactical conventional airpower between the Korean and Vietnam Wars was not entirely neglected by these organisations, nor by Tactical Air Command (TAC) and Air Research and Development Command (ARDC). Using Allison's Model II decision-making construct, I will show how emphasis on it continued, although with mixed results. I will use Model II to explain USAF organisational decision-making, showing how tactical conventional airpower was advanced during the Eisenhower Administration. A summary of results and analysis will follow.

MODEL II DECISION-MAKING

The model explains the decision-making process of governments by understanding how their organisations and sub-organisations routinely work. The model postulates that, far from being a unitary rational actor, the government is a actually a *'conglomerate of semi-feudal, loosely allied organisations, each with a substantial life of its own . . . Governmental behaviour can therefore be understood… less as deliberate choices and more as outputs of large organisations functioning according to standard operating procedures' (emphasis in original).*[91]

Large organisations consist of complex units and smaller sub-units, all directed by humans with limited capacity to generate alternative courses of action, process information, and solve problems (described as bounded rationality).[92] Organisational problems can be so complex that organisations will split up or 'factor' problems into smaller parts in order to deal with them independently.[93] Often, an organisation's structure reflects how a unit factors its problems. The Department of Defense, for example, is structured by services, each with specific methods of warfare (land, sea, and air). Although each service is independent, their areas of expertise can overlap (e.g. each service has some airpower). Nevertheless, each contributes differently to the defense of the United States and the achievement of national security objectives. Then, as now, the Air Force was sub-divided to contend with its functional missions.

When each organisation or sub-organisation proceeds through the decision-making process, the units, being led by humans, tend not to conduct an all-inclusive search for the best alternative. Rather, individuals within the unit are inclined to search for an alternative that is 'good enough' to meet its objective(s) and conclude their search when the first alternative is found that will 'satisfy' the organisation's problem.[94] That is not to say that establishments are unstructured in their search process, but rather, simply restrictive in the number of alternatives sought for consideration. Moreover, organisations often consider past decisions to find answers for current problems (especially if they are reoccurring). They use solutions that worked in the past and limit their 'repertoire' of choice. Additionally, leaders in the units hesitate to base decisions on uncertain futures and will choose options that emphasize 'short-run feedback.'[95] For example, the Air Force may determine its pilot training capacity by simply estimating the number of pilots leaving the service in the upcoming year, failing to allow for other factors such as a change in demand for pilots in wartime, as happened during the Korean War. Preferring not to base decisions on an uncertain future, organisations may often make decisions that appear short-sighted.

Although an organisation's behavior tends to remain fairly steady, units do have the capacity to learn from past mistakes and may change incrementally over time. When change is determined to be in its best interest, an organisation may alter its goals, rules, and procedures. Furthermore, when faced with decisions, it tends to view the decision-making process with a unit bias. Parochial priorities and perceptions will prejudice an organisation's search for alternatives for a particular course of action.[96] For instance, in Korea the Army considered close air support (CAS) vital to its success. The Air Force, conversely, perceived CAS as a diversion from airpower's best use—influencing the enemy behind the front through strategic bombardment or aerial interdiction. Organisational bias caused the Air Force to

de-emphasise CAS at various times in favour of aerial interdiction. By comprehending an organisation's priorities, perceptions, and issues, a unit's decision-making process and its propensity to change/improve over time may be better understood.

One final factor that influences decision-making is called 'imperialism.' According to Allison, many organisations state their principal goal as improving the health of the unit. Health or imperialism can be defined as 'growth in budget, manpower, and territory.'[97] When 'New Look' became the United States' national security policy, nuclear weapons were the primary means of fulfilling national security objectives. The Navy and Air Force then fought for a piece of the nuclear pie. After the 'revolt of the Admirals', the USAF's imperialism over the strategic nuclear mission ensured its health for the immediate future. From a Model II perspective, the Air Force's decision to favor nuclear weapons can be explained as the principal way the organization would increase its stature and power in a time of defense down-sizing (not to mention that strategic nuclear attack fitted nicely into contemporary airpower doctrine).

By applying Allison's Model II analysis to multiple subordinate unit-level decisions, a better understanding is possible of the advancement of tactical airpower within the USAF. There are four areas of interest: the Tactical Air Command's decision-making process, the development and procurement of tactical aircraft, conventional munitions, and the progress of training that furthered conventional tactical airpower.

In Korea the Army considered close air support (CAS) vital to its success. The Air Force, conversely, perceived CAS as a diversion from airpower's best use

TACTICAL AIR COMMAND

The Air Force, like all large organisations, consists of several smaller organisations. Between Korea and Vietnam, many of these organisations contributed to the development of airpower differently. In January 1946, General Eisenhower (then Army Chief of Staff) and Chief of the Army Air Forces General Spaatz agreed to functionally reorganise the Army Air Force for the post-war environment.[98] The commands included Strategic Air Command, Air Defense Command, Tactical Air Command, Air Training Command, Air Materiel Command (March 1946), and the Air Transport Service. Strategic Air Command (SAC) was 'charged to conduct long-range operations in any part of the world at any time; to perform maximum long-range reconnaissance over land or sea; and to provide combat operations in any part of the globe, employing the latest and most advanced weapons.'[99] Air Defense Command's mission was defense of the continental United States while the Tactical Air Command (TAC) was to work closely with ground forces. Although fighter aircraft were placed in each of these three commands, TAC had the job of preparing for conventional warfare. TAC was required to 'cooperate with land and sea forces in ground and amphibious operations and to train and equip tactical air units for operations anywhere in the world. It was also charged to promote 'progressive development of air-ground co-ordination techniques and doctrines."[100] By factoring airpower into separate organisations, General Spaatz and the United States Air Force (after its establishment in 1947) were better able to contend with the complex problems associated with the decision-making of the varying airpower missions.

TAC was the Air Force's primary tactical airpower organisation, led by noteworthy individuals from the start. Generals Quesada, Lee, Barcus, Cannon, Weyland, and Everest endeavored to advance the organisation along its established path. General Weyland is remembered as the foremost advocate of tactical airpower during the 1950s. His career was predominantly in the tactical fighter realm. During World War Two, he commanded the famed XIX Tactical Air Command, supporting General Patton's Third Army push through Germany. Weyland went on to serve as Ninth Air Force Commander, Assistant Commandant of the Command and General Staff School (CGSS), Chief of Staff of the Air Staff for Plans and Operations, Far East Air Force Commander in Korea, and then Commander of TAC from April 1954 to July 1959.[101]

Weyland remarked, 'I did get to know the Army forwards and backwards, which helped me later on going through various schools. So I picked up a lot of information and knowledge and appreciation of what they have to do and what their problems were.'[102] From his experiences, General Weyland understood that a well-balanced tactical air force would be required to contend with war contingencies of the 1950s. He understood the possibility of 'periphery' or 'brush-fire' wars and the necessity of a viable conventional force to win those limited wars.[103] To ignore limited war, Weyland warned, would be an invitation to disaster.

Parochial priorities and perceptions of General Weyland and his Tactical Air Command staff greatly influenced how grand strategic airpower problems and decisions were viewed. The larger Air Force organisation (and SAC) approached US national security problems with the narrow view that strategic bombardment was the principal means of waging war, while TAC members viewed America's problems from a tactical airpower perspective. From co-operating and co-ordinating with surface forces, TAC members approached airpower problems from a viewpoint consistent with past tactical employment practices, and the application of limited force in Korea was a guide. They searched for ways of completing America's national security policy of assisting allies without escalating a conflict to a general nuclear war. At one level, Air Force leadership advocated preparation for a worst-case nuclear war which would ensure the continued growth of the Air Force budget and territory, and on a lower level General Weyland argued at a 1954 commanders' conference that brush-fire war, in an area where America was least prepared, was the most probable form of future conflict.[104] Weyland proposed the advancement of tactical airpower capabilities, which would provide for growth of TAC. Differing parochial views, at different organisational levels presented diverging recommendations to the national security problems facing the United States.

Despite Weyland's unique insights into future conflict, he realised that there was money available only for nuclear expansion. The foundations were laid for tactical airpower to employ tactical nuclear weapons,[105] and on assuming command Weyland postulated that it would provide the flexibility and versatility in limited wars that strategic bombers lacked. By arguing that tactical nuclear and conventional munitions could contribute to both general and peripheral war, Weyland perceived a way to advance tactical airpower.[106] If TAC was to improve its health, then tactical nuclear weapons were necessary to future advancement.

To further increase the 'territory' or spectrum of influence of tactical airpower, Weyland originated an idea to develop a mobile tactical air force as a deterrent to local brush-fire wars. Initiated by Weyland and developed in an Air War College thesis by Col Richard Klocko, Ready Air Fleets were envisioned to be state-side tactical airpower units readily deployable anywhere in the world.[107] Klocko described a fleet-in-being that could deter local aggression. The Ready Air Fleet could include:

1 Medium Bomb Wing with 1 Squadron Medium Strategic Recon attached
1 Fighter Interceptor Wing (All Weather)

1 Light Bomber Wing (Night and All Weather)
2 Fighter Bomber Wings
1 Tactical Recon Wing
1 Medium Troop Carrier Wing
2 Squadrons Medium Transport
4 Squadrons Aerial Refuelling (capable of refuelling all types of combat aircraft in the command)
1 Aerial Resupply and Communication Group
1 Ground Defense Task Force composed of 6 Defense Flights and 1 Support Flight.[108]

Subsequently, the Ready Air Fleet was adopted and renamed the Composite Air Strike Force (CASF), contributing to national security objectives by being the nation's first line of defense in limited war and augmenting Strategic Air Command's capability to deter general war.
In July 1955, TAC established Nineteenth Air Force, which was to develop the CASF concept. Nineteenth Air Force Commander, Brig Gen Viccellio, fulfilled Weyland's idea. By September 1956, Viccellio was able to deploy a token Composite Air Strike Force to Europe. The CASF included 'one squadron of F-100C day-fighters, one squadron of F-84F fighter-bombers, a flight of B-66 tactical bombers, and a flight of RF-84F reconnaissance aircraft.'[109] Although the concept did not increase the size of TAC, CASF did provide a tool to project tactical airpower quickly to confront a limited war. Finally, TAC had a limited capability (reliant upon, but not confined by nuclear weapons) to project tactical airpower around the world. Tactical Air Command's imperialism would grow in stature within the Air Force and help ensure its survival in a nuclear dominated military.

From a Model II perspective, General Weyland and TAC may have instituted the CASF based on former deployments and procedures from World War Two and the Korean War, when fighters were deployed overseas. Past fighter deployments may well have led to the development of CASF, which became part of contemporary standard operating procedure for TAC. Furthermore, by establishing CASF, Weyland attempted to improve the health of TAC by increasing the spectrum of influence to overseas locations. Once established, further funding would likely follow.

Tactical Air Command's imperialism would grow in stature within the Air Force and help ensure its survival in a nuclear dominated military

Douglas B-66

USAF and TAC's efforts to advance tactical airpower were not limited to the creation of the Composite Air Strike Force. Aircraft, munitions, and training were also developed.

TACTICAL AIRPOWER RESEARCH AND DEVELOPMENT

Following World War Two, research and development and procurement and production of new aircraft systems were the responsibility of Air Materiel Command (AMC), but in 1950 research and development went to Air Research and Development Command (ARDC).[110] The Deputy Chief of Staff, Development, in HQ USAF, was also created to guide all research and development efforts within the Air Force. In 1951, USAF Chief of Staff General Vandenberg assembled the Air Force Council to handle all senior level decisions. Working with the Headquarters Air Staff and the Aircraft and Weapons Board, the Air Force Council determined the final Air Force policy regarding what weapons systems to develop.[111]

These new arrangements depended on the speed and the quality of new developments. Proper planning for new weapons systems would ensure that the Air Force would remain at the cutting-edge of aircraft technology. A weapons system included every aspect of the aircraft: airframe, propulsion, avionics, and munitions. All aspects had to be compatible and meet the specifications set by Headquarters.

The normal programmed flow from concept to actual weapon system followed a specified course. Senior Air Staff planners decided the need, Air Staff and the Aircraft and Weapons Board would make recommendations to the Air Force Council, which would in turn inform the Air Research and Development Command what system to develop, why it was necessary, and how it should perform. ARDC designed the specifications and evaluated the contractors' proposals. After Air Force Council approval, ARDC would work with the contractor to construct an experimental model, which would undergo tests to see if it met the standards and could withstand combat conditions. If so, production would commence, with a typical development-to-production timeframe of four to eight years.[112] Final aircraft production decisions were made on Air Force Council direction.
The Air Force relied on civilian research and development guidance to stay abreast of current technology. The USAF Scientific Advisory Board (SAB), established in 1944 by General Arnold, was charged with 'providing scientific-technical advice aimed at insuring aero-space supremacy.'[113] SAB worked closely with civilian aircraft industry experts, universities, and the Rand Corporation to provide the Air Force with recommendations for future development to remain the world's aviation leader. The SAB recommended development or improvement in such programs as vertical take-off, air-to-air fire control, infrared search and track, conical scanning radars, electronic combat measures, and airborne gun sights.[114] The Air Force would adopt the board's recommendations, incorporating them into current designs or upgrading existing systems. The SAB was instrumental in improving the capabilities of tactical airpower throughout the 1950s.

Air Force research and development funding grew rapidly from $62.3 million in 1950 to $720.5 million by 1957.[115] By 1960, over half of the total research and development budget was directed toward intercontinental and intermediate range ballistic missiles and electronics,[116] whereas tactical airpower received a minute portion ($20 million out of $1.043 billion) in that year.[117]

ARDC consisted of ten centers that watched the scientific research and development of civilian industries and universities, and supervised the development of most weapons systems.[118] Of these, the

Wright Air Development Center and Flight Test Center conducted the development and evaluation of new weapons systems, which contributed to tactical aircraft production. The Armament Center and the Air Proving Ground Command worked to advance tactical conventional munitions. Although the emphasis at the time was nuclear, research and development of conventional airpower remained part of the standard operating procedures of these organisations, ensuring that conventional capabilities were included in future aircraft designs.

TACTICAL AIRCRAFT

At the Department of Defense level, aircraft research and development began under the direction of the Research Airplane Program (RAP), a joint research effort by the NACA and the military services.[119] Conceived near the end of World War Two, the RAP performed flight studies using a series of specially designed research aircraft. From the late 1940s through the 1960s, research aimed to improve manned flight in aircraft at speeds up to about 4,500 miles per hour and at altitudes up to about 350,000 feet. Two general categories of aircraft were developed: first to improve jet aircraft performance, including such designs as the X-1, D-558 I, X-1A, X-2, and the X-15 and second to investigate the effects of different aircraft configurations, including such designs as the X-3, X-4, and X-5.[120] The entire aviation industry contributed and benefited from the testing, and the effect for the Air Force was the incorporation of research results into the supersonic fighter aircraft developed in the 1950s.

From the late 1940s through the 1960s, research aimed to improve manned flight in aircraft at speeds up to about 4,500 miles per hour and at altitudes up to about 350,000 feet

Bell X-1

RAP was the foundation for the aeronautical engineering theory that the Air Force relied upon to construct its fighter designs. Using this foundation, the Air Force incorporated SAB recommendations together with ARDC suggestions to formulate aircraft designs that could meet near-term fighter aircraft requirements as determined by Air Force objectives. For instance, the Air Force Council directed the development of the F-100 based on the supersonic testing of the RAP, the recommendations of the Scientific Advisory Board, the evaluation and suggestions for improvements from the Air Proving Ground Command (among other centers), and the Air Force's need to replace the obsolescent F-86.

Decision-making and final procurement were influenced by the several organisations involved. Each had standard operating procedures governing the research, development, and procurement of fighter aircraft. Prior to Korea, tactical aircraft designs were based on a non-nuclear mission. As a result, many organisations had established procedures for aircraft design with a non-nuclear mission. Following Korea, the nuclear mission grew in importance within tactical airpower design. However, the conventional (non-nuclear) role of tactical airpower did not cease to exist. By examining four fighter aircraft in particular (the F-100, F-101, F-104, and F-105), I will show how tactical aircraft development decision-making within the Air Force impacted the tactical conventional mission.

F-100 SUPER SABRE

The North American F-100 Super Sabre was the first of the Air Force's 'Century Series' fighters and the first supersonic fighter. Intent on quickly developing a replacement fighter, the Air Force Council agreed with the Aircraft and Weapons Board's recommendation to begin production on the F-100 prior to flight-testing in 1953.[121] It was to be a clear weather, air superiority fighter, but ultimately was designed and employed as a fighter-bomber.[122] Design modifications and procurement of the F-100 continued simultaneously from 1951 through 1955. Several organisations recommended modifications and improvements to design in order to increase its air-to-air and air-to-ground kill potential. In December 1953, 'black boxes' were added, and a larger tail fin to improve handling. Larger internal fuel tanks and 450-pound external fuel tanks were added to increase range. Although a conventional fighter, TAC asked that the F-100 be modified to allow for tactical nuclear munitions.[123] To improve nuclear munitions delivery, the F-100 was to incorporate the low-altitude bombing systems (LABS).

The F-100 possessed the latest conventional weapons set-up. It utilised the AB/APG-30 radar and could employ the AIM-9B air-to-air missile. Later models were modified to carry the GAM-83 Bullpup command guided bomb, one of the first precision-guided munitions. It carried 2.75-inch forward-firing aerial rockets, four 20mm M-39 machine guns, and up to 5,000 pounds of general-purpose bombs. External stores, both munitions and external fuel tanks, were designed to be carried beneath the wings and on the centerline of the aircraft. With the J-57-P-7 jet engine and state-of-the-art aircraft design, the F-100 was designed to be a highly maneuverable fighter that rivalled the latest Soviet fighters (MiG-19 Farmer).[124] Additional modifications to convert it into reconnaissance and 'Wild Weasel' surface-to-air missile (SAM) suppression platforms would make it one of the Air Force's most versatile conventional tactical fighters during the 1950s and 1960s. In all, 2,294 F-100s of all types were produced for the Air Force.

The F-100 was one of the first USAF jets to be employed in Vietnam, but with employment limitations. First, its accident rate was very poor, due primarily to an under-powered engine with afterburner nozzle problems, and control problems associated with design characteristics.[125] Second, some conventional weapons could not be supported by all F-100s, while others could only carry a limited number if

F-100 Super Sabre

The F-100 was designed to be a highly maneuverable fighter that rivalled the latest Soviet fighters (MiG-19 Farmer)

properly modified.[126] Similarly, only the F-100F possessed 375 rounds of gun ammunition, while the rest only had 200. Third, only the D and F models had a radar-warning receiver (RWR), a device which proved invaluable in North Vietnam in one of the world's most heavily defended air spaces.

F-101 VOODOO

Developed from lessons learned in Korea, McDonnell's F-101 Voodoo was originally conceived as a long-range escort, penetrating Soviet air defenses in order to protect SAC's nuclear bombers.[127] The Air Force Council in 1952 approved the alteration of design that would change the mission of the F-101 from an interceptor to a nuclear fighter-bomber. The F-101A and C models were designed for the tactical nuclear role and possessed no conventional capability. TAC reluctantly received its first Voodoo in 1957, finding it was not constructed to operate on short, unprepared runways, a requirement of all TAC's deployable jets.[128] The Voodoo was transformed into a reconnaissance platform and continuously updated with improvements developed by electronics industry. The RF-101 became TAC's reconnaissance workhorse.[129] The McDonnell Aircraft Corporation finally built an interceptor version (F-101C) to be used by the ADC, but the Voodoo's greatest contribution to tactical airpower was in the form of tactical reconnaissance.

RF-101 Voodoo

The Voodoo's greatest contribution to tactical airpower was in the form of tactical reconnaissance

The F-104 killed many pilots. It was removed from service in1968

F-104 STARFIGHTER

From lessons learned in Korea, the Lockheed F-104 Starfighter was originally designed to be a light-weight, day only air-superiority fighter, to fly higher and faster than any Soviet aircraft. First flown in 1956, the F-104 suffered engine problems on its way to become the first production aircraft capable of flying faster than Mach two.[130] The Air Defense Command received its first Starfighter in 1958 and employed it as an interceptor (F-104A). The heart of the F-104's fire control system was NASARR (North American search and range radar), which was capable of air-to-air (look down, shoot down) and air-to-ground modes,[131] representing state-of-the-art technology for tactical conventional airpower. Augmenting the F-104's radar was a newly designed infrared sight conceived to detect enemy heat signatures at short to medium distances.

Additionally, the Starfighter could employ all the latest conventional munitions: AIM-9B air-to-air missiles, 2.75-inch rockets, and 930 pounds of conventional bombs. The Vulcan M-61 20mm cannon was unreliable and removed from the jet,[132] later to be retrofitted when deficiencies had been resolved. The F-104 was also originally designed with a downward firing ejection seat, which proved highly unsatisfactory. Due to design problems, both versions of the Starfighter interceptor (F-104 A and B) were as quickly phased out of ADC as they were accepted.

TAC received its first fighter-bomber version of the F-104 in 1958. The F-104 C/D/G were modified based on recommendations of ARDC to include a more powerful engine, a new ejection seat, an external probe-drogue air refuelling system, and external nuclear munitions.[133] The final version of the Starfighter was capable of all-weather fighter-bomber operations with a capacity to carry 2,510 pounds of conventional munitions, AIM-9Bs, 2.75-inch rockets, and the retrofitted M-61 20mm internal cannon. Although not originally developed as an all-weather fighter-bomber, the amazingly quick F-104G possessed a respectable conventional capability.

The F-104 had several serious deficiencies. First, its stubby little wings failed to provide maneuverability for close-in dog fighting. (During a dogfight in 1965, a Pakistani F-104 was outmanoeuvred by an Indian Mystere.) Similarly, the USAF its use in Southeast Asia to high altitude patrols far away from enemy MiGs and to screening B-52s bombing jungle targets over South Vietnam.[134] Second, its combat radius was poor. Third, although able to carry the latest conventional and tactical nuclear munitions, its pilots did not consider it a viable weapon system for air defense against Soviet bombers. With only two seconds of gun employment possible and two air-to-air missiles, it would quickly be out of ordnance, with ramming the only remaining option.[135] Fourth, the F-104 killed many pilots. It was removed from service in 1968.

F-105 THUNDERCHIEF

Developed from Korean War experience, Republic's F-105 Thunderchief ('Thud' for short) was conceived by company designers working with TAC and the USAF Special Weapons Center, Kirtland. Designed as a low-level tactical bomber capable of delivering one nuclear weapon, the F-105 evolved into a fighter-bomber witnessing seven years of combat in Vietnam employed in roles it was not designed for.[136] Agreed by the Air Force Council in 1952, production and testing of the new supersonic tactical bomber began in 1955. Design problems occurred, and modifications done. By 1958, eleven different F-105s were being tested at five different test facilities around the United States.[137] Concurrently, the Air Force issued a GOR (General Operational Requirement – defines aircraft mission and other performances and capabilities) requiring the addition of new J75 engines, an advanced fire-control system, and an in-flight refueling capability.[138]

Evolution of the F-105 continued. In May 1957, the Air Force Council decided it wanted the Thunderchief to be an all-weather attack aircraft, and improvements to flight instrumentation and navigation equipment occurred. In 1959, TAC accepted the F-105 as its newest fighter-bomber due to its short take-off capability.[139] Its delivery system was modified to accept conventional munitions. A new engine, the J-75-P-19, and a new fire-control system (MA-8) were added, improving its speed, and ability to bomb visually or blind.[140] Later modifications allowed the F-105 to be employed as a Wild Weasel.

Later Thunderchiefs were the Air Force's principal fighter-bombers during the early years of the Vietnam War capable of delivering the greatest conventional air-to-ground munitions loads while employing air-to-air ordnance for self-defense. The Thud could carry up to sixteen 750-pound conventional bombs supersonically at low-level, and could carry every conventional munition then available, including the GAM 83 Bullpup (F-105D and later models). Moreover, it had the internal M-61 20mm cannon with enough ammunition for eleven seconds. For longer-range shots, the Thud could shoot the AIM-9B heat-seeking missile.[141]

The Thunderchief did have faults. First, it was deployed to Southeast Asia without RWR, getting it later in the war. Second, designed as a low altitude bomber, it suffered severe battle damage in combat. Significant limitations were the non-self-sealing internal fuel tanks and the dual hydraulic lines placed close together. Third, poor maneuverability and poor rearward visibility lessened its value as a dogfighter. In all, F-105s shot down 27 and one half MiGs during the Vietnam War, but lost 383 of the Air Force's total inventory (833) during the seven years of combat in Southeast Asia.[142]

Comparing USAF and Soviet fighters, it is apparent that the Air Force did not devote enough effort to aerial maneuverability. In 1965, the USAF Fighter Weapons School at Nellis conducted a series of performance tests to rate current USAF fighters against the MiG-15/17 type of aircraft. They evaluated the F-100, F-104, F-105, and F-4C (none of them designed as dogfighters). In no case could Air Force jets adequately compete with the Soviet-made fighters[143] either offensively or defensively. Given the emphasis on nuclear missions within the Air Force, USAF fighters were not developed to be highly manoeuvrable or capable of defeating an enemy fighter in a dogfight. Aerial combat of past wars was not envisioned for future conflicts, and the lessons of both World Wars and Korea were disregarded.

From a Model II perspective, conventional fighter developments were heavily influenced by previous fighter development procedures. Since World War Two, fighters were developed with both air-to-air and air-to-ground capabilities. Despite the emphasis on nuclear weapons, those past procedures guided contemporary fighter design and as a result conventional weapons remained part of the Century Series fighters. Established standard operating procedures allowed for continued tactical airpower improvements, but not all the aircraft designs and conventional weapons capabilities were optimised for

Thunderchiefs were the Air Force's principal fighter-bombers during the early years of the Vietnam War capable of delivering the greatest conventional air-to-ground munitions loads while employing air-to-air ordnance for self defense

the warfare witnessed during Korea. Design decisions were satisficed* (compromised by competing interests) and consequently led to degradation in fighter performance during Vietnam.

Further tactical aircraft research and development was severely restricted with the launching of the Soviet satellite Sputnik in 1957. From 1945 to 1954, the Air Force requested and received funding for the development of 23 different fighter aircraft. From 1955 to 1965, it would only ask for and receive funding for one.[144] Senior USAF leaders directed research and development funding almost entirely to strategic missions.

TACTICAL CONVENTIONAL MUNITIONS

As with aircraft, the development of conventional munitions was similarly constrained during the period between Korea and Vietnam. After the USAF's independence in 1947, the Department of Defense did not want to see duplication of effort in munitions development. The Air Force retained control of nuclear weapons development and the Army continued its responsibility for developing and producing all high explosive, fragmentation, and semi-armour piercing bombs.[145] The Air Force was allowed to develop equipment that stayed with the plane (bombsights, fire control systems, guns, bomb racks, and rocket launchers). Incendiary bombs belonged to the Army's Chemical Service, and armour-piercing bombs were given to the Navy.[146] For air-to-air weapons, the unguided rockets of World War Two became the guided infrared (IR) and radar-guided missiles of the 1950s. No organisation seemed to have responsibility for missiles, so both the Air Force and Navy embarked on the quest to develop aerial missiles. During New Look, nuclear weapons were predominant, but conventional munitions not entirely neglected.

*satisfice=to accept the first acceptable, but not necessarily optimal, solution presented.

CONVENTIONAL AIR-TO-GROUND MUNITIONS

Aerial bombing originated in World War One when pilots dropped munitions by hand over the side of their planes. The general-purpose bombs used in Korea were those designed for World War Two, to include 100, 500, 1,500, 2,000, 3,000, and 4,000-pounders.[147] The aim was maximum bomb-load for internal carriage, resulting in a stubby, non-aerodynamic shape rendering them fairly imprecise. There was 'little co-ordination between aircraft designers and bomb developers, and insufficient co-ordination even between the bomb and fuse designers.'[148] During the mid-1950s, the Navy developed the newer Mark-80 series bombs, but with fin and fuse problems, they were not much of an improvement. The older M-117 and M-118 bombs were improved in shape, but bomb guidance remained little improved.[149] From a Model II perspective, the Air Force was satisfied with its general-purpose bombs and directed research and development funding on nuclear munitions. If the Air Force was to improve its health, nuclear weapon development was vital to match national security strategy.

Development of cluster bomb units (CBU) and anti-tank munitions also stagnated during the 1950s. This was not surprising, given that there would be 'no more Koreas.' If nuclear weapons could destroy a tank, why spend time and money on developing conventional weapons?

Nevertheless, the Air Proving Ground Command at Eglin AFB in Florida was established in 1949 to focus on conventional weapons development for the Air Force. One project was the US Navy's guided aerial bomb (GAB-83) Bullpup. Guidance had begun with the Germans in World War Two, evolving through the Korean War.[150] Bombs such as AZON, RAZON and TARZON, although lacking some accuracy, were now in the USAF inventory.

Development of Bullpup guided bomb was approved in 1954, in two versions: 250 and 1,000 pounds warhead weight. The Navy received its first Bullpup in 1958, and the Air Force in 1960.[151] The Air Force wanted to incorporate this munition into current fighter designs, but by the start of Vietnam, only the F-100D and F-105 were capable of employing it. Bullpup required radio guidance from the pilot who had to watch it to its target. If he lost sight of it (cloud, dust, need to maneuver etc) it became unguided and would probably miss the target.

With Dulles's New Look in 1954, scientific and weapons specialists reallocated effort to developing larger and more accurate nuclear weapons, affecting Air Force, Army and Navy. The Navy Ordnance Test Center at China Lake fitted nuclear warheads to just about everything that could fly or could be dropped.[152] Nuclear munitions such as Snark, Rascal, Crossbow, Longbow, and Corvus evolved during the 1950s at China Lake.[153] One conventional Naval munition handed on to the Air Force was Shrike, a high-speed, anti-radiation missile designed in 1958 as a passive receiver attached to a missile body, which would kill a radar-emitting antenna on air defense systems that included SAMs. The Air Force's Wild Weasel aircraft (F-100 and F-105) employed Shrike during Vietnam.

By 1959, specialists in the Navy's Weapons Planning Group stated a need for non-nuclear munitions, believing that the United States would not employ nuclear weapons during a future conflict. They also noted that conventional weapons throughout the defense establishment were severely lacking in capability,[154] prompting a shift in emphasis away from nuclear weapons. The Air Force would follow suit years later.[155] During this time, laser technology steered the development of precision-guided munitions (PGM) that eventually matured into the lethal weapons employed in Linebacker I (1972) and DESERT STORM (1991). Unfortunately for the Air Force, it did not take responsibility for bomb development from the Army until the commencement of the Vietnam War,[156] at which time tactical airpower would rely predominantly upon general-purpose bombs and marginally effective Bullpups.

F-22 Raptor

During Vietnam, the M-61 performed well in air-to-air combat and is still in use today in the F-15, F-16, and F-22

Between Korea and Vietnam, the Air Force focused primarily on nuclear weapons and failed to ask for more conventional bombs from the Army Ordnance Division. It is not surprising then, that they had shortage of conventional general-purpose bombs during the first two years of Vietnam; thus several combat sorties flew 'with less-than-full bomb loads and less-than-optimum kinds of weapons.'[157]

CONVENTIONAL AIR-TO-AIR MUNITIONS

Conventional air-to-air weapons, on the other hand, fared better. During Korea, only the 50-caliber machine gun and 2.75-inch folding fin rocket were available. Following the war, the M-39 20mm machine gun evolved, with a greater rate of fire. Employed by the F-86 and F-100, the M-39 was only an incremental advancement in air-to-air capability.[158]

The Vulcan M-61 20mm Gatling gun, however, was a significant advance. The six-barrel cannon was capable of firing 6,000 rounds per minute at high muzzle velocity,[159] a dramatic improvement in aircraft machine guns. With fewer sudden starts and stops when firing, it was also more reliable. The F-104 and F-105 were the first aircraft designed to utilise this weapon. Even though other US fighters (air defenders such as the F-101, F-102 and the Navy's F-4) were not modified for the gun, the M-61 would be modified, corrected, and then later used extensively during Vietnam. An external pod was also designed to house the gun on aircraft that did not possess one. During Vietnam, the M-61 performed well in air-to-air combat and is still in use today in the F-15, F-16, and F-22. During Operation LINEBACKER, the M-61 was credited with seven aerial victories, and the heat-seeking AIM-9 ten.[160]

After Korea, rockets continued to receive research and development emphasis. The USAF worked to develop the T2-14 2.0-inch folding-fin rocket, a concept developed to shoot between 50 and 52 high-speed rockets in rapid succession at enemy aircraft,[161] employed first by the F-94. The US Navy also developed a pod to shoot a large number of 2.75-inch rockets, and the Zuni was incorporated by the Air Force.

An F-100 fires a AIM-9 Sidewinder missile

Falcon, Sidewinder, and Sparrow were shot from an aft position during the Vietnam War and therefore did not represent a revolutionary increase in air-to-air employment doctrine over Korea tactics

Folding-fin rocket pods were the precursor to air-to-air missiles. Rockets were unguided projectiles fired in large numbers shotgun fashion. Air-to-air missiles were guided either by a heat source or from commands from the shooter's radar. In 1956 the Air Force developed and procured the AIM-4 Falcon missile, both in the infrared and radar-guided versions. It remained in service for 25 years.[162] Designed to shoot down large, non-manoeuvring Soviet bombers, Falcon proved only marginally effective against smaller, highly manoeuvrable fighters. The Air Force would eventually abandon the AIM-4 in favour of Navy air-to-air missiles developed during the 1950s. The Air Force put less effort into advancing the Falcon, but more into nuclear-tipped air-to-air missiles. Genie was the product of extensive USAF work for air defenders such as the F-102, becoming operational in 1957.[163]

The Navy's Ordnance Test Center at China Lake developed two air-to-air missiles still employed by fighters today. The first was the GAR-8, later re-designated the AIM-9 Sidewinder IR heat-seeking missile. This Mach 2.5 missile relied on the heat generated from exhaust of an enemy jet for guidance.[164] Early versions had to be fired from an aft position in order for the seeker to 'see' its target.[165] The Air Force adopted the Navy's missile into several of its fighters. During Vietnam, the AIM-9 achieved only 14% effectiveness, largely due to inexperienced pilots not understanding the correct firing position. AIM-9 shot opportunities were further reduced by the changing 'cone' behind a manoeuvring enemy. Other problems were missiles guiding on the sun, reflections on clouds, and being easily decoyed by enemy flares.[166]

The second Navy missile later bought by the Air Force was the AIM-7 Sparrow radar guided missile,[167] entering service in 1956.[168] Sparrow was larger and more expensive than Sidewinder, due partly to the solid rocket motor, which would burn longer and provide greater range. The Air Force integrated this missile in the 1960s after receiving the F-4 Phantom. Similarly to the AIM-9, Sparrow was employed with marginal effectiveness. It achieved most kills in Vietnam, but rules of engagement required prior visual identification of a target. By having to manoeuvre astern of the adversary, the Sparrow's increased range was negated. All three missiles (Falcon, Sidewinder, and Sparrow) were shot from an aft position during the Vietnam War and therefore did not represent a revolutionary increase in air-to-air employment doctrine over Korea tactics.[169]

From a Model II point of view, however, air-to-air developments within the Air Force were a substantial advancement for tactical conventional airpower. Standard operating procedures ensured that air-to-air missiles were evolved and adopted into fighter aircraft designs. Although missiles had weaknesses, the 1950s set the foundation for a level of air-to-air weapons capability equal to or greater than any other country in the world. Developments contributed to increasing tactical conventional airpower that ultimately led to the success of DESERT STORM.

TACTICAL AIRPOWER TRAINING

Tactical Air Command's greatest contribution to the advancement of tactical airpower was training. Periodic training was laid down to further the efficiency of its units. Between Korea and Vietnam, exercises were instigated to improve skills and inter-service co-operation, together with tactical airpower concepts and effectiveness of weapons system platforms. Along with the Composite Air Strike Force (CASF), TAC participated in European rotation plans, joint tactical exercises, and advanced tactical airpower training.

With the advent of CASF came the concept of rotating tactical airpower units from the United States to Europe where many of them were envisioned to operate if war ever broke out with the Soviet Union. In 1954, TAC sent the 389th Fighter Bomber Squadron to Toul-Rosiere Air Base in France as part of the first 'ROT' (rotational duty).[170] These six-month ROTs were conceived to augment tactical airpower already in Europe. By, July 1960, 110 ROTs had been conducted.[171] ROTs and CASF deployments to other countries around the world were also designed to 'show the US flag' and prepare USAF squadrons for quick deployments to any place in the world. Within eight hours of notification, a CASF could be sent anywhere, and TAC successfully deployed airpower to Lebanon (Operation Double Trouble) and Formosa (Operation Mobile Zebra in November 1957),[172] both in 1957. Although not employed in combat, tactical airpower's presence was credited with quelling the conflict with communist forces.

Tactical units also participated in joint and combined exercises around the world. The first major joint Air Force/Army Air-Ground tactical exercise after Korea, Sage Brush, occurred in 1955, with General Weyland as the TAC co-ordinator. Sage Brush was the first and only large-scale test of tactical nuclear war tactics and included the most realistic conditions possible short of war.[173] 30,000 airmen, 850 aircraft, tactical missiles, and 110,000 Army troops were spread over seven southern states.[174] The principal lesson learned was that whoever launched the first tactical nuclear weapon ultimately destroyed the adversary's tactical airpower. Even if a nation possessed a second-strike capability, there would be destruction of tactical forces and the situation would inevitably escalate into a general nuclear holocaust.[175] Following Sage Brush, all tactical exercises were conducted with non-nuclear weapons.

TAC continued to exercise, both singly and jointly with Army and Navy forces, and by 1961, had participated in operations such as Jack High, Cross Feed, Flash Back, Bright Star, Pine Cone I/II/III, Solidarity, and Long Pass.[176] These exercises highlighted both strong and weak points of tactical airpower, and units would return home to improve on weak areas and perfect strengths. Use of weapons systems was much improved. Inter-service weaknesses were highlighted, such as close air support for the Army. To overcome this, the Air Force devoted ten to fifteen of its tactical airpower squadrons scheduled for deactivation to the Army and the CAS mission,[177] a move agreed by the Chiefs of Staff and JCS in 1961. Improvements were made to the Air Force's Air-Ground Operations School (AGOS) in Florida and TAC Manual for 'Joint Air-Ground Operations (TACM 55-3).[178] In its first four years, AGOS graduated 15,000 airmen trained to support ground forces with CAS.

Following World War Two, fighter experience was passed on to young pilots at the Fighter Gunnery School at Nellis AFB. After Korea, in 1954 the school was renamed the USAF Fighter Weapons School,[179] whose primary mission was to train instructors in aerial gunnery. During the 1950s, the F-51, F-80, F-84, and F-100 were the primary fighter aircraft used for instruction. In 1957, another gunnery school opened in Phoenix, Arizona: the 3525th Combat Crew Training Wing. This school also trained instructors, but now in the F-86F.[180] During the Eisenhower Administration, both schools primarily focused on advancing tactical airpower missions, although some tactical nuclear instruction emerged late in the 1950s.

The shoot-down in 1960 over the Soviet Union of Gary Powers in a U-2 spy plane caused great consternation for the United States

In 1951, The Fighter Weapons School began the classified Fighter Gunnery Newsletter to draw lessons from Korea. It grew to include up-to-date information on procedures, tactics, weapons, and more.[181] Becoming the primary source of information on tactical airpower, the Newsletter provided a forum for new ideas by writers throughout the Air Force. It has grown substantially and is still in print under a new name.

TAC's training methods appear impressive. Much was done to quickly deploy tactical combat airpower anywhere in the world, but the tactical training provided through exercises and the Weapons Schools was primarily to prepare for a large war in Europe against the Soviet Union. Given the Air Force's position that another Korea was unlikely, there was little preparation for limited combat in other environments or locations. Many tactical combat procedures would transfer directly to Vietnam, but inexperienced aircrews were not prepared for combat in Southeast Asia. Only the veterans from Korea had some preparation for North Vietnam. By 1965, most Korean War veterans were either retired or too senior to be serving full time in fighter cockpits. Aircrew training, one of the Air Force's strongest qualities during the Korean War, suffered during the latter half of the 1950s.

The low-level tactics developed for Europe would prove impractical in Vietnam. More than 80 percent of all US aircraft shot down were engaged below 3,000 feet.[182] Furthermore, tactics had not yet been developed to counter the growing SAM threat. The shoot-down in 1960 over the Soviet Union of Gary Powers in a U-2 spy plane caused great consternation for the United States. Electronic warfare research and development organisations worked to counter this new threat with anything other than low-level attacks. The hope was that low-level attacks would reduce the detection ranges and time for attack of the SAMs. After Vietnam, the USAF followed the Navy's lead in developing a large-force training exercise to prepare aircrews for the robust combat environments expected against a formidable air defense system.

Only when they purchased the Navy-designed F-4 did the USAF possess a fighter that could deliver all types of bomb loads and successfully engage in air-to-air combat

WAS TACTICAL AIRPOWER IMPEDED? A MODEL II ANSWER

Several agencies were concerned in the development and improvement of conventional tactical combat airpower. Senior-level guidance came from the Air Force Council, which received recommendations from Air Staff, Aircraft and Weapons Board, TAC, NACA, and the ARDC. Although Massive Retaliation had an inordinate influence on the directions of the Air Force Council during the 1950s, lower-level organisations had standard operating procedures that positively impacted conventional tactical airpower. These procedures steered several organisations to continue managing conventional tactical airpower issues beneficially. The contributions of TAC and General Weyland ensured tactical airpower's capability to deploy forces to locations spanning the globe. With brush-fire wars in mind, Weyland compelled the Air Force and several of its organisations to consider how their programs dealt with the spectrum of conflict below nuclear war.

For tactical aircraft development and procurement, a Model II analysis reveals that the plethora of agencies involved tended to satisfice their search for solutions. Although standard operating procedures existed to ensure conventional weapons were incorporated into fighter designs, those designs of the 1950s were largely created for delivery of tactical nuclear munitions, except for the F-100 and the F-104, which were modified later. Tactical nuclear airpower grew in importance, but the ability to deliver non-nuclear ordnance either marginally improved or declined. Aircraft such as the F-101 and the F-104 would see little use in Vietnam except in reconnaissance or alert air defense missions. Of the aircraft that could drop conventional bombs, only a handful were properly configured to employ Bullpup or other 'guided' munitions. Most aircraft were relegated to delivering general-purpose bombs and in less than full loads. None of the fighters were developed to be a formidable and agile dogfighting platforms that could contend with the aerial fights witnessed during Korea or World War Two. Perhaps research and development would have overcome these deficiencies.

1950s fighters were intended to deliver tactical nuclear weapons or intercept nuclear bombers. Decisions about conventional modification were at best marginal. Combat performance during Vietnam demonstrated that fighters such as the F-105 Thunderchief were highly susceptible to ground fire. If the Thud survived its attack, it often failed to destroy its target, being unable to deliver guided bombs or carry enough general-purpose bombs. Although the Air Force produced several tactical aircraft capable of dropping conventional munitions between the Korea and Vietnam Wars, none can be considered as

substantial improvements. Only when they purchased the Navy-designed F-4 did the USAF possess a fighter that could deliver all types of bomb loads and successfully engage in air-to-air combat.[183] Additionally, creative initiatives led to the development of the AC-47 and AC-130 Gunships in the early 1960s, which proved viable combat platforms during Vietnam. Had the Air Force embraced Flexible Response earlier, tactical airpower could all the sooner have reduced losses during the initial months of the air war in Vietnam.

A Model II examination of conventional air-to-ground munitions development during the 1950s reveals that the Air Force compromised its conventional munitions due to the relatively new advancement of nuclear weapons. During the 1950s, much effort went to nuclear weapons and ICBM developments, and little to tactical conventional munitions. Although TAC and General Weyland foresaw the brush-fire war, they were content that conventional munitions existed with an adequate capability. More importantly, from an organisation's health perspective, TAC saw the procurement of tactical nuclear munitions as necessary to its survival. Only after TAC realised that it would not be overcome by SAC, could non-nuclear weapons program improvements be considered. Unfortunately, most of the lower-level Air Force organisations also shifted their efforts to nuclear programs. Furthermore, the Air Force did not gain control of conventional bomb development from the Army Ordnance Division until the early 1960s; an easy way to factor USAF efforts and funding in order to focus the Air Force's attention on nuclear weapons. Again, had the Air Force embraced flexible response sooner, it is likely that conventional munitions development and procurement would have had an effect in Vietnam.

Air-to-air weapons development fared much better, although still not as well as in the Navy. AIM-4 Falcon and the Vulcan M-61 20mm cannon were significant to aerial armament developments. Similarly, AIM-9 Sidewinder (and later the AIM-7 Sparrow) for USAF fighters provided a significant air-to-air capability. Although all the missiles were designed to be employed against non-maneuvering bombers, continued testing and modifications during the 1950s led to advanced missiles that surpassed anything the Soviets had produced. Most importantly, standard operating procedures were in place to provide for further developments in air-to-air weapons development. The principal hurdle for advancements in DoD air-to-air weapons development was the reoccurring adversarial relationship between the Navy and the Air Force, a struggle for power and primacy.[184]

The standing requirement for periodic training improved USAF tactical airpower. Through the CASF, ROTs to Europe, and many annual joint and combined exercises, tactical airpower was able to practice deploying and employing realistically. Although a good deal emphasis in nuclear weapons steered tactical airpower training, much of the training transferred to the employment of conventional weapons. The level of detail in planning missions, the low level bombing runs, the protection from enemy fighters, air refuelling, and tactical reconnaissance are all similar in tactical conventional or nuclear missions. The fact that the Air Force continued to train vigorously between Korea and Vietnam improved tactical airpower's value at the commencement of the Vietnam War.

From a Model II framework, several organisational efforts continued to advance tactical conventional combat airpower during the 1950s. Advancements in fighter development and air-to-ground munitions were only marginally effective. Conversely, improvements in air-to-air weapons and continual training throughout the 1950s substantially advanced tactical combat airpower. The mixed results of this Model II analysis demonstrates that despite the emphasis on strategic missions and nuclear weapons, the Air Force did not entirely neglect tactical conventional airpower, whose advancement was due to ongoing routines and operating procedures. Factoring of the Air Force's decision-making problems resulted in the preservation of USAF tactical conventional airpower during the time of nuclear plenty. An examination of the individual decision-making process within the Air Force will complete the understanding of whether and to what extent the USAF neglected tactical airpower between Korea and Vietnam.

(To be concluded in the next issue)

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