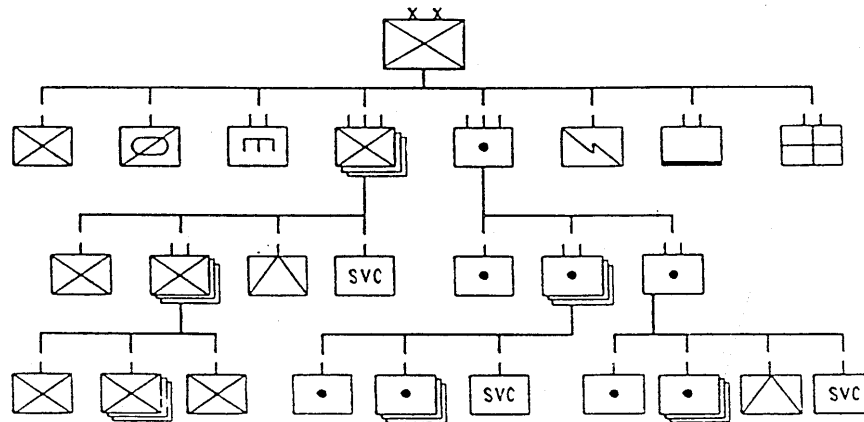


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UNITED STATES ARMY FORCE STRUCTURE AND FORCE DESIGN INITIATIVES 1939-1989



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**UNITED STATES ARMY
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UNITED STATES ARMY FORCE STRUCTURE AND FORCE DESIGN INITIATIVES, 1939 - 1989

The United States Army exists to defend the national interests of the United States. Force structure (the number and type of units) and force design (the makeup of individual units) are critical features of an army. From ancient times when the Roman legions defeated the Greek Phalanx at Cynoscephalea in 197 BC and at Pydna in 168 BC, to the modern age when better organized German armored divisions overwhelmed the French and British army in 1940, or when the United States annihilated the Iraqi army in 1991, the size, makeup, and design of an army, particularly its basic fighting unit, have been important to the outcome of a conflict. The way an army organizes, structures, and designs its forces determines in great measure how an army will fight.

Since 1935 the U.S. Army has undergone a series of changes in both force structure and force design. By far, the more complex adjustments have been in force design. Beginning with the triangular division in 1939, and continuing over the intervening fifty years, a myriad of studies, names, acronyms, recommended and actual changes all conspire to confuse planners about force design antecedents. In other words, because we are not sure where we have been, we are not certain how we got to where we are today.

This paper provides an overview which examines division force structure and force design initiatives from immediately preceding World War Two to the present. It defines both terms in the context of the force development process, briefly discusses Army division force structure changes from 1939 to 1989, then concludes with an examination of force design efforts over the same period. My aim is to identify the major force design initiatives over the last 50 years and bring order to what happened; to look at what was done, why it was done that way, who had a major role, and what resulted. Trends and lessons that surface in this study will aid current planners who continue their part of this dynamic process.

FORCE STRUCTURE vs FORCE DESIGN

Students and planners often use the terms force structure and force design interchangeably and indeed no fixed meanings exist for the two words. Force structure is often used incorrectly as an all encompassing term to describe every facet of the size, shape, and composition of the Army. To avoid such imprecision, I use the following definitions throughout this paper.¹

¹ These definitions were developed from Robert B. Tinsman, ed., Army Command and Management: Theory and Practice. Department of Command, Leadership, and Management (Carlisle Barracks, PA: USAWC, 1989), Chapter 11; and AMC/TRADOC PAM 70-2, Materiel Acquisition Handbook, 1987.

FORCE DEVELOPMENT: The integration of allocated and projected Army resources into a time-phased program to develop a force that is properly organized, equipped, trained and supported to carry out the Army's missions and functions. It has three tasks: design unit models, develop force structure, and document unit authorizations.

FORCE STRUCTURE: A mixture of model units based upon objectives to be achieved, the threat, Army warfighting doctrine, and externally imposed constraints such as funding and end strength. The composition of a force, by number and types of TOE units and organizations, within given guidance.

FORCE DESIGN: Establishing unit models to reflect developments in doctrine, tactics, equipment modernization, and mission changes. These unit models are building blocks, and establish increments of capability for the Army to develop an effective, efficient, and combat-ready force structure. The task of designing these blocks consists principally of three interactive processes:

- * Developing Unit Reference Sheet (URS) organizations.
(recommending new units)
- * Developing Basis of Issue Plan (BOIP)/ Qualitative and Quantitative Personnel Requirements Information(QQPRI). (force modernization)
- * Developing a Table of Organization and Equipment (TOE).
(specifying tasks, manpower, and equipment for authorized units)

FORCE STRUCTURE 1939 - 1989

Appendix A shows the United States active Army divisional force structure for each year since 1939. During the last half century, three principal considerations have influenced the number and type divisions in the force: manpower constraints, budgetary constraints, and preparations to fight a general war in Europe.

The National Defense Act of 1920 provided for an Army of nine fully manned divisions, allocating one to each of the nine respective geographical corps areas. Throughout the 1920's and 30's manpower and budget limitations kept these divisions as skeletonized units or worse. In midsummer, 1939, the stateside Army was scattered among 130 posts, chiefly battalion-sized, and only three of the nine infantry divisions had even the framework of divisional organization.

President Franklin D. Roosevelt began rearmament of the Army in 1938, and the outbreak of war in Europe in September, 1939, added impetus to the Army's expansion. The French collapse in 1940 quickened the pace of American mobilization and the Army had 36 divisions by the end of 1941. Only one, however, was on a full war footing.²

In the fall of 1941, Army planners had two premises. First, they anticipated that the Soviet Union would collapse under the attack of Hitler's legions. Second, with the USSR defeated, the United States and Great Britain would have to bear the strategic offensive in Europe to defeat Germany. To accomplish this, the War Department predicted that the Army would need a peak strength of 213 divisions. The official troop basis issued in January 1942, projected 73 of those divisions by the end of that year; 74 were actually activated, although the 2nd Cavalry Division was partially disbanded in July. Despite other estimates of as high as 350 divisions, the common assumption in the War Department was that a minimum of 200 divisions would ultimately be needed to win the war.

By the end of 1942 a number of factors coalesced to dictate a significantly lower divisional force structure figure. This prompted the War Department to decrease its total mobilization

² Russell F. Weigley, History of the United States Army (Bloomington, Indiana: Indiana University Press, 1984), p. 419.

goal for the end of 1943 to only 100 divisions. Abandonment of plans for a 1943 invasion of France eliminated the immediate need for a large ground army. Increased emphasis on the bombing offensive with a resultant increase in the size of the Army Air Forces further reduced the manpower pool available to form divisions. Projected shipping restrictions further reduced the immediate need for divisions because the Navy anticipated a lack of transport to move them overseas during 1943. Finally, the chairman of the War Production Board announced a reduced procurement program that physically limited the number of units the Army could train and equip.

In early 1943 the War Department saw difficulty in meeting even the interim 100 division goal. The combination of reduced overseas deployments and training reductions due to materiel shortages caused units to accumulate in the continental United States. Billeting shortages became serious as did accusations that the military was mismanaging call-ups and needlessly draining critically needed personnel from the industrial and agricultural sectors of the economy. General George C. Marshall, U.S. Army Chief of Staff, approved a troop basis of 90 divisions for 1943, which became the final figure for the war. By the end of 1943 all 90 divisions were activated.³

³ Robert R. Palmer, Mobilization of the Ground Army, The Army Ground Forces (Washington: Historical Section, Army Ground Forces, 1946), pp. 1-19; Kent Roberts Greenfield, ed., Command Decisions (Washington: Government Printing Office, 1971), 365-381; Shelby L. Stanton, Order of Battle. U.S. Army World War II (Novato, CA:

The end of hostilities brought a pell-mell two year demobilization that reduced the Army to only 10 divisions. Between World War II and the outbreak of the Korean War, budgetary limits imposed by public and congressional desires for an austere defense program limited U.S. ground forces to the point that "hollow divisions" were stripped of organic units and left seriously understrength. Doctrine was preoccupied with preparing for a general war in Europe. Since budgetary constraints precluded maintaining a large standing army oriented toward Western Europe's defense, military planning emphasized building a full-scale mobilization capability like that in World War II.⁴

After the National Security Council issued NSC-68 in the spring of 1950, U.S. planners projected Soviet nuclear parity with the United States by 1954. The need to provide military muscle to support the NSC strategy of containing Soviet expansion drove planners to seek an appropriate general force structure to supplement nuclear capabilities. Their concepts served as a

Presidio Press, 1984), p.7. For a detailed discussion of Army mobilization and force structure decisions during World War see Kent Roberts Greenfield, Robert R. Palmer, and Bell I. Wiley, The Organization of Ground Combat Troops, The Army Ground Forces (Washington: GPO, 1987), and Robert R. Palmer, Bell I. Wiley, and William R. Keast, The Procurement and Training of Ground Combat Troops, The Army Ground Forces (Washington: GPO, 1948).

⁴ William P. Mako, U.S. Ground Forces and the Defense of Central Europe (Washington: The Brookings Institute, 1983), p.8.

blueprint for the conventional force build-up during Korea.⁵ The expansion to 20 divisions by 1953 still reflected strategic preoccupation with Europe as well as the need to fight the war in Korea. While the four divisions in Japan went to Korea, the United States simultaneously increased the active formations available stateside for a general war, and added four divisions to the ground forces in Europe. Part of the rationale behind Korean War force structure actions was to encourage European rearmament.⁶

The "New Look" policy of the Dwight D. Eisenhower administration with its reliance on nuclear weapons and emphasis on tax cuts and balanced budgets reduced the number of divisions back to 14 by 1960. The driving factor was a budgetary restriction which manifested itself as limited dollars and ongoing personnel reductions. In 1958 the Secretary of Defense wrote, "On the basis of anticipated manpower cuts, the Army had planned to reduce the total number of its combat divisions to 16 during the year. An actual cutback in military strength...to 900,000 men...required that the total number of divisions be reduced to 15."⁷

⁵ Robert P. Haffa, Jr., Rational Methods, Prudent Choices: Planning U.S. Forces (Washington: National Defense University Press, 1988), p. 41.

⁶ Mako, pp. 11-13.

⁷ Semiannual Report of the Secretary of Defense. January 1 - June 30, 1958 (Washington: GPO, 1959), p. 101.

The John F. Kennedy administration recognized the bankruptcy of massive retaliation as a doctrine to offset the military threat from the Soviet Union and China and wanted to minimize reliance on nuclear weapons. It adopted a "two-and-a-half-war" strategy while Secretary of Defense Robert S. McNamara mapped a course to increase combat ready, active duty divisions to 16. The Army activated additional heavy units since they were appropriate for a European battlefield. The Berlin crisis in 1961 and call up of reserve divisions created a temporary bulge to 18 divisions.⁸

Three divisions were added to the force structure during the Vietnam War. As President Richard M. Nixon ended our involvement in that war, he also changed our national strategy to a one-and-a-half war focus. In the early 1970's planning for the "1/2" war portion halted. By 1971, domestically imposed constraints of manpower cuts, public isolationist and anti-war opinion, and drastically lower defense budgets led to a 13 division force.⁹

Throughout the remainder of the 1970's U.S. planning focused almost exclusively on Europe. On 21 February 1974 General Creighton W. Abrams announced the decision to restore the active Army to 16 divisions. The United States believed that the

⁸ Annual Report of the Secretary of Defense. Fiscal Year 1962 (Washington: GPO, 1963), p.15; Mako, U.S. Ground Forces, pp.10-17; Weigley, History of the United States Army, pp.538-540.

⁹ Haffa, pp.43 and 84.

increased Soviet force structure and technological improvements since 1968 allowed them to launch an attack against Western Europe without warning or reinforcements. Adding to U.S. concerns was Soviet acceptance of a "short war" strategy designed to win in Europe before NATO could mobilize its forces. Still lacking money and manpower, the Army created divisions by streamlining and trading off support services and assigning reserve force units the mission to reinforce active Army divisions and thereby raise them to authorized strength. Under this "Total Army" concept, certain divisions would receive "roundout" battalions to complete their organization upon mobilization.¹⁰

During the 1970's, fiscal austerity limited the Army to planning for major contingencies. The force structure remained stable at 16 divisions. After Vietnam, rapid deployment support systems were seen as superfluous. "The lowered perception of the threat and the limits imposed on the defense budget in accordance with the Nixon Doctrine ensured that forces dedicated to the support of limited contingency would lose priority."¹¹ Starting in 1979, Soviet adventurism in Afghanistan and the problem of Khomeini's regime in Iran raised the possibility of U.S. forces being deployed to Southwest Asia. The fears of an expansionist communist challenge were complicated by the new fear

¹⁰ Mako, pp.24-29; Weigley, p.573.

¹¹ Haffa, pp.95.

of spreading Muslim fundamentalism; consequently, the need for an ability to react militarily to any global contingency attracted President Jimmy Carter's attention.¹² The Army's growth to 18 divisions by 1986 through the creation of specially designed "light" divisions resulted from these strategic concerns and the belief that terrorism and low- to mid-intensity conflict presented an increasingly likely scenario for U.S. military involvement.

Arriving at the force structure has always been an imprecise art. In 1972, General Maxwell D. Taylor wrote, "Successive administrations have tried to improve the quality of the policy guidance available to the Armed Forces, although in my view much still remains to be done, particularly in the establishment of yardsticks of sufficiency for the functional forces...Why does the Army need seventeen divisions rather than fifteen or nineteen? We are still about as far from rational answers to such questions as we were in 1959."¹³

There has been progress since General Taylor wrote those words, but the rationale behind the numbers is still elusive, and not always based on strategic logic. Whatever the size force, and despite the honest efforts of planners to base the force

¹² Ibid., pp.84 and 96.

¹³ Maxwell D Taylor, Swords and Plowshares (New York: W.W. Norton and Company, Inc., 1972), p.176.

structure on rational planning factors, the driving force that determines the number of divisions is the dynamic interaction between available manpower and budgetary considerations. Perceived threat usually drives the mixture of units.

FORCE DESIGN 1939 - 1989

Each force structure change during the last 50 years occurred in unique circumstances, usually a reaction to war or a response to peace, and was isolated from changes that preceded and followed it. Each change in divisional force design--that is, what makes up the division-- has improved upon the previous design, making the new division, through improved mobility, communications, control, and firepower, more lethal than its predecessors. Unlike the disjointed, usually reactive force structure efforts, force design has been characterized by continuities and cumulative improvement in key areas of concern. An exception is the Pentomic division of the late 1950's, but radical new demands of the atomic era made that a period of doctrinal and organizational confusion for all the armed forces, not just the Army.

Force design is a tale of greater flexibility, improved mobility, increased combat power, and tactical and administrative integration occurring at lower echelons. Force structure was primarily driven by manpower and budget limitations, but the key

factors in division design decisions have been: available mobility, communications capabilities, firepower, the perceived threat, and both fiscal and manpower resource constraints. Doctrine has also played an increasing role in force design in the later years.

Appendix B lists the force design initiatives since 1935. The remainder of this paper discusses those initiatives and any trends that have emerged over the last 50 years.

TRIANGULAR DIVISION (1939)

During the Spanish American War the United States Army used triangular divisional organizations with three brigades of three regiments, each regiment having three battalions of four companies. The Field Service Regulation of 1905 formalized the organization. During World War I the Army provisionally organized into square divisions, and at the conclusion of the war it retained its infantry divisions in a square configuration with two brigades of two regiments each (see p. C-1). The regiment in turn had three infantry battalions and a machine gun company. These divisions met the peculiar needs of trench warfare for

driving power, endurance, shock action, and easy passage of lines, but "lacked organic flexibility and mobility".¹⁴

In 1920, General John J. Pershing, who commanded the then demobilized AEF, called for a "three unit system" that was "elastic", mobile, and built to operate in North America. Mobility was especially important and the square division was "entirely too unwieldy" for mobile warfare.¹⁵ Nonetheless the square division organization changed only slightly during the 1920's although debate about the division continued. When General Malin Craig became the Army Chief of Staff in 1935, he ordered a complete review of organization and tactics. The proposed design for the infantry division was along triangular lines, tested by the 2nd Infantry division in 1937, redesigned, and tested again by the same division in 1939. That same year, General George C. Marshall, as new Army Chief of Staff, ordered the reorganization of regular infantry divisions into the triangular configuration.¹⁶

¹⁴ The Army War College. Development of Organization, U.S. Army, G-3 Course No. 7, 1923-1924. Committee No.1. Conference November 26, 1923, File 275-1, US Army Military History Institute, Carlisle Barracks, PA (hereafter referred to as MHI).

¹⁵ John J. Pershing, Wrapper Indorsement to the Report of Superior Board on Organization and Tactics. General Headquarters, American Expeditionary Force, Washington, D.C., June 16, 1920, File 52-15, MHI.

¹⁶ John B. Wilson, Divisions and Separate Brigades. Army Lineage Series. Unpublished Manuscript (Washington: Center of Military History, June, 1990), Chapter 4; Jonathan M. House, Toward Combined Arms Warfare: A Survey of 20th-Century Tactics, Doctrine, and Organization, CSI Research Survey No. 2 (Fort

Gone were the two brigades and one of the regiments from the old square division. The new organization had an artillery regiment, plus three regiments of three infantry battalions each, all supported by division engineer, signal, ordnance, quartermaster, medical, and military police units, in addition to a mechanized reconnaissance troop.

Of the four considerations that influenced the change to the new organization, the two most important were the need to improve mobility and increase flexibility. The triangular division enhanced mobility because it used less road space than the 35.8 miles required by the square division, and could deploy from movement formation faster than the square division. It improved flexibility by eliminating the excessive reserve of the old organization. The three regiment arrangement provided a convenient reserve for the division commander. Furthermore the smaller overall unit allowed the use of a separate division as the reserve. Eliminating the brigade echelon reduced the command overhead, allowing faster transmission of orders. A third factor driving change was the need to exploit new technology, weapons and firepower. General Craig specifically directed the War Department staff to examine reorganization and tactical changes that best used "the advantages of motorization, mechanization, and increased firepower". Fourth, planners designed the division

Leavenworth: U.S. Command and General Staff College, August, 1984), pp. 71-75.

based on the assumption that North America would be the probable future theater of operations.¹⁷

Troop strength for the standard infantry division, as adopted in 1941 (see p. C-2), was 15,245 men compared to 28,105 in the World War I division. Since planners assumed the division would be part of a larger force that would provide combat and logistical support, the new infantry division had a minimum of organic artillery and auxiliary units.¹⁸ Adjustments in the infantry division organization during World War II were confined to decreasing its size (as a response to shipping and manpower shortages) rather than reorganization. Due primarily to the efforts of Lt. Gen. Lesley McNair the division remained a compact offensive force with a minimum of specifically defensive weapons, streamlined for open warfare, and bolstered by "pooled" support units at corps and army level.¹⁹

17 Ltr, AG320.2 (11-4-35), subject: Reorganization of the Division and Higher Units., dtd. November 5, 1935, signed by Malin Craig, File 52-72, MHI; Memorandum For The Assistant Commandant, The Army War College, subject: The Infantry Division Organization from the Viewpoint of Tactical Employment., Dtd. April 29, 1933, by Maj Harold R Bull, File 397-13, MHI; Major General Fox Conner, lecture delivered at the Army War College, 18 September 1931, File 383-A-8, MHI; Ibid., 21 March 1933, File 393-A-15, MHI.

18 Virgil Ney, Evolution of the U.S. Army Division 1939-1968, Combat Operations Research Group Memorandum M-365 (Fort Belvoir, VA: U.S. Army Combat Developments Command, 1969), p. 37.; Greenfield, Palmer, and Wiley, p. 277; Weigley, p. 464.

19 Greenfield, et al, p. 300.

Armor divisions were first formed in 1940. Their development differed significantly from the infantry division, and profoundly influenced future division design initiatives. At the outset, the design of armored divisions gave them greater flexibility and more auxiliary units, in the expectation that they would operate independently for extended periods. The original armored division had an armored brigade of three tank regiments (two light, one medium), an artillery regiment of two battalions, and an armored infantry regiment in support. In 1942, the division was reorganized into two regiments of three tank battalions each, an armored infantry regiment of three battalions (transported by lightly armored halftracks), and three battalions of self-propelled 105 mm. howitzers (see p. C-3). At this time two "combat commands" (CCA, CCB) were added to the division. These sub-headquarters, analogous in combat to the brigade in current U.S. divisions, allowed the division commander to assign forces to a combat command as he chose for a specific tactical mission, task organizing almost any desired ratio of tanks to infantry and other arms.²⁰

By 1943, combat experience, the need to conserve manpower, and the desire for greater flexibility led to another armor division redesign that eliminated the regiments and added a reserve "combat command" (CCR). Now there were three each armor,

²⁰ Ibid., pp. 319-323.; George Forty, U.S. Army Handbook 1939-1945 (New York: Charles Scribner's Sons, 1980), pp.57-59.

armored infantry, and armored artillery battalions, and division strength dropped from 14,620 to 10,937 men (p. C-3). All nine battalions of armored type (tank, infantry, and artillery) were made administratively self-contained, and all tank battalions were alike and interchangeable.²¹

These organizational design changes during the war aimed to obtain flexibility and economy of manpower. Technological advances, such as motorization and improvements in communication, permitted change; improved weaponry and firepower required it. The trend was "away from the organic assignment of resources to large commands according to ready-made patterns, and toward variable or ad hoc assignment to commands tailor-made for specific missions"--in other words, toward task organization.²² Evidence of this tendency included the idea that armies and corps should consist of whatever troops were necessary for the mission; the concept that divisions would enter combat reinforced by attachment of non-divisional elements; and the fact that by the end of the war even TOE infantry divisions were forming combat teams made up of infantry regiments with attached artillery, engineers, tanks, and so forth.

The World War II armored division presaged future design changes, such as the ROAD division. The battalion became the

²¹ Greenfield, et al, pp. 320, 326-329.

²² Ibid., p. 280.

primary combat unit. Doctrine acknowledged that battalions could be added, subtracted, and moved about within the division as necessary to meet specific tactical needs. Thus the armored division of World War II introduced a greater flexibility than the infantry division enjoyed because the infantry still relied upon the regiment for the tactical employment of its battalions. Fifteen years later force design planners noted that the infantry regiments of World War II were fixed type TOE units that were tailored with their particular slice of the resources from the fixed division. The resulting organization, however, tended to be established and unchanging. The armored division combat commands, meanwhile, were specifically designed to attach and detach varying numbers and types of combat and combat support units, providing significant vertical and horizontal flexibility.²³

The triangular division continued without substantial change from the end of World War II until 1956 (see p. C-4). After the war, the U.S. European Theater of Operations established the General Board to analyze the strategy, tactics, and administration of theater forces. One committee recommendation was that the Army field only infantry, armor, and airborne divisions since specialized organizations during the war were singularly unsuccessful. The board also forwarded

²³ Reorganization Objective Army Divisions 1961-65(U) (Short Title: ROAD-65(U)) (Fort Monroe, VA: United States Continental Army Command, 1 March 1961), pp. B-1 and B-2.

recommendations for adjustments to the three divisional designs based on wartime experience.

The Army implemented several recommended changes to the infantry, armor, and airborne designs between 1948-1950. The main alteration was to increase firepower and to make organic to the division the units that previously were assigned from higher headquarters during combat. Thus the size of divisions grew.

The authorized infantry division strength increased to 18,804 men with the addition of antiaircraft artillery, strengthened engineer, military police, maintenance, and quartermaster units as well as men to provide better communications, intelligence, reconnaissance, and administration. The armored division retained its 1943 organization, but gained an antiaircraft artillery battalion. It added a 155mm. self-propelled howitzer battalion for increased general support, replaced the tank destroyer battalion with a heavy tank battalion, restored the quartermaster supply battalion that had been removed in 1943, and strengthened its military police contingent.

The Army made these adjustments, based on combat experiences, while attempting to adjust for the increased difficulty in conducting reconnaissance and gathering intelligence because of the greater depth and breadth of the

battlefield. For the time being, the assumption was that the atomic bomb would not substantially alter the nature of ground combat.²⁴

PENTOMIC ARMY (1956)

The "lessons" of the Korean War (1950-1953) redefined the roles assigned to the armed services and influenced the resources available to each. The post Korean-War years 1953-1961 were ones "of isolation and prolonged adversity: of shrinking manpower ceilings, reduced budgets, and widespread doubts about [the Army's] utility in future wars".²⁵ Reduced resources, the global commitment of containment, and a dedication to decreased defense spending and balanced budgets, prompted President Dwight D. Eisenhower's "New Look" policy which relied on massive retaliation for any aggression. Eisenhower emphasized air deliverable nuclear weapons rather than ground combat forces. This redefined the role of each service in line with the requirements of the atomic age.

Eisenhower believed airpower was key to deterrence. In his view, the Army had the mission to maintain order at home after an

²⁴ This entire discussion of post World War II triangular division design is based on Wilson, Divisions and Separate Brigades, Chapter 7.

²⁵ A.J. Bacevich, The Pentomic Era. The U.S. Army Between Korea and Vietnam (Washington: National Defense University Press, 1986), p. 8.

enemy nuclear strike. "[After a nuclear attack we] would have to restore order and who is going to restore it? Do you think the police and fire departments of those cities could restore order? Nuts! That order is going to have to be restored by our military forces and by our Reserve."²⁶ He envisioned no major combat mission along the lines of World War II or Korea. With such a superficial role in the nation's defense, the Army became a prime target for budget-cutters seeking to reduce defense expenditures. From 1953 to 1957 the Army's budget fell from \$15 billion to \$7.5 billion, while manpower decreased from 1.5 million to 998,000 men.²⁷

The Army leadership struggled to adjust to the tactical impact of nuclear weapons on the battlefield. While openly advocating a more flexible national strategy, it moved to develop a concept of warfare that would be practical and at the same time help the Army to lay claim to more budget dollars. The Army leaders had to show that land forces could play an important role in deterring war. To accomplish this, technology was highlighted as the principal determinant shaping future battlefields.

²⁶ Eisenhower quoted in John C. Glennon, ed., Foreign Relations of the United States, 1955-1957. Vol XIX. National Security Policy (Washington, DC: Government Printing Office, 1990), p. 40.

²⁷ Bacevich, pp. 15-19.

Army planners developed a concept of warfare for the nuclear battlefield that called for heretofore unimagined dispersion to protect the force and reduce the likelihood of the enemy using nuclear weapons because the scattered targets would be individually less lucrative. The strategy demanded increased flexibility and mobility to mass quickly and strike a foe, then disperse again. The net effect was the need to expand mechanization, improve communications, develop futuristic weapons appropriate to atomic warfare, and improve strategic mobility through air transportable organizations.²⁸ An organization with these characteristics would justify increased funding.

From the "New Look" debates came the Pentomic division, perhaps the only division design from 1939 to 1989 that did not clearly enhance division capabilities or significantly improve upon the structure it replaced. It did, however, define the Army's role in the next war, "which justified appeals for funds to develop novel sophisticated weapons".²⁹

The Pentomic design did not appear overnight. A series of studies, all pointed toward more conventional design changes, preceded the "Pentana" study of 1955. As early as 1952, the Army Field Forces initiated reorganization studies when it asked the Infantry School to examine proposals for the infantry and

²⁸ Ibid., pp. 50-66.

²⁹ Wilson, Divisions and Separate Brigades, p. 303.

airborne regiments. Then in 1953, the Infantry School examined the organizations of both the infantry and airborne divisions. Foreshadowing the future ROAD reorganization, it recommended that both type units be designed with task force organizations similar to armor divisions, noting that the fixed infantry regiment forced the commander to base his plan on the organization rather than the mission.

In January 1954, acting upon a letter the previous month from Army Chief of Staff General Matthew Ridgeway, the G3, Department of the Army instructed the commander of Army Field Forces to develop an initial tactical and organizational concept of a type field army by 1 June 1954.³⁰

On 19 April 1954, the Office of the Chief of Staff provided further guidance which led to the first extensive divisional field tests since 1939. The Department of the Army wanted unit designs to be more mobile, more flexible, and less vulnerable to atomic attack. At the same time, General Ridgeway directed that the new units needed more favorable combat capability-to-manpower ratios, an optimum balance between combat and supporting units, and the most efficient use of technological advancement. Tactical doctrine evolved concurrently with the design and

³⁰ Letter, ATDCH 320(TS), Chief of Army Field Forces to Chief of Staff, subject: Organization of the Army During the Period FY 1960-1970, 9 June 1954, Record Group 319, National Archives and Records Administration, hereafter cited as NARA.

ultimate reorganization of units was to begin by 1 January 1956.³¹

Army Field Forces submitted two proposals on 9 June 1954. Because time was lacking, it did not coordinate the studies with the Technical and Administrative Services, with the three combat Arms Schools, or with the Command and General Staff College. Nevertheless, on 21 July, General Ridgeway approved the studies for further refinement and as guidance for research and development. He felt, however, that the proposals in the studies failed to retain sufficient conventional weapons, and that they devised an organization designed to fight exclusively under atomic conditions. He requested that any new design have a powerful non-atomic capability, and by the fall of 1954, the Army Field Forces had developed the Atomic Field Army (ATFA-1).³²

Infantry and armored divisions in the Atomic Field Army-1 were similar in their design. The armored division retained its task force organization with three combat commands, three medium and three heavy tank battalions, and three armored infantry

³¹ Directive, Office, Chief of Staff (Deputy Chief of Staff for Plans and Research) to Chief of Army Field Forces, subject: Organization Studies to Improve the Army Combat Potential-to-Manpower Ratio, 19 April 1954, Record Group 337, NARA.

³² Letter, ATDCH 320(TS), Chief of Army Field Forces to Chief of Staff, subject: Organization of the Army During the Period FY 1960-1970, 9 June 1954, Record Group 319, NARA; Information Paper, G3 020 DA TS, subject: Organization of the Army During the Period FY 1960-1970, 21 Oct 1954, Record Group 319, NARA; John Wilson, Divisions and Separate Brigades, pp. 305-306.

battalions. The infantry division (see p. C-5) now also had three combat command headquarters with seven infantry battalions and one armor battalion, thus eliminating the regimental organization. Both divisions had support commands whose commander was charged with providing support to the division as a whole. Instead of each technical staff agency being separately responsible for its area of expertise, the new design organized service support along functional lines by removing the technical staff from division headquarters and creating a functional staff organic to units in the Support Command. The infantry division's strength dropped to around 13,500 men, a reduction of nearly 4,000 personnel. The armor division lost almost 2,700 men, for a strength of around 12,000 personnel.³³

In February 1955, the 3d Infantry Division and the 1st Armored Division tested ATFA-1 organizations in field exercises FOLLOW ME and BLUE BOLT. Later that year, based on those tests, the Army Field Forces revised the ATFA-1 organizations and the same two divisions evaluated the adjustments on Operation SAGE BRUSH during November to December 1955.³⁴

While the ATFA-1 design was being developed and tested, the Army Field Forces was simultaneously working on a new division design. After General Ridgeway approved further work on the

³³ Wilson, Divisions and Separate Brigades, pp. 306-307.

³⁴ Ibid., pp. 307-308.

initial ATFA-1 studies (June 1954), Army Field Forces replied that a new study would be required to develop an organization that could wage either an atomic or a conventional war. In November 1954, Ridgeway tasked Army Field Forces to conduct studies to define an army capable of fighting nuclear or non-nuclear war, and submit its results by 1 October 1955. This second study, running simultaneously to the ATFA-1 study, eventually emerged as PENTANA.³⁵

On 30 June 1955, General Maxwell D. Taylor assumed duties as the Army Chief of Staff. He exerted a profound influence on the new design initiatives. Recognizing that the pressures of the "New Look" would further cut Army manpower, he decided that his primary task as Chief of Staff was to "limit the attrition of the limited war capability." In other words, he was determined to protect army budget levels and would use the new division design to do this.

Taylor drew from his experiences as Eighth Army commander during and after the Korean War to influence directly the type

³⁵ Information paper, G3 020 DA TS, Office of the Assistant Chief of Staff, G3, subject: Organization of the Army During the Period 1960-1970, 21 October 1954; Letter, Office of the Assistant Chief of Staff, G3, Operations, Department of the Army, subject: Organization of the Army During the Period 1960-1970, 17 November 1954; Doctrinal and Organizational Concepts For An Atomic-Nonatomic Army During the Period 1960-1970 (C). Short Title: PENTANA Army (U), Abridged Edition (Fort Monroe, VA: United States Continental Army Command, 10 May 1957), p. 1. (Hereafter referred to as the PENTANA Study). The name PENTANA: PENT (from penta -- for five sided) and A-NA (atomic - nonatomic army).

design that would emerge. Based on lessons he drew from the war, Taylor believed the triangular division was outmoded. During 1954, while rebuilding the South Korean Army, he used a Korean division to study a number of possible division organizations and reached several conclusions "with regard to the principles which should guide the restructuring of the infantry division". It should be adaptable to non-nuclear limited war and to general war involving nuclear weapons; it must be able to disperse into small units capable of independent action; it must be able to concentrate swiftly without danger of attack by nuclear weapons; "the optimum number of subordinate units was about five, a fact which led [him] to consider a pentagonal rather than a triangular structure for [the] new division".³⁶

The Assistant Chief of Staff, G3, Major General James Gavin, had conducted his own exercises in 1954 while commander of the US VII Corps in Germany to test tactics for the atomic battlefield. He concluded that except for the armor divisions, the triangular divisions could not adapt themselves to nuclear tactics. Gavin advocated designing the infantry divisions into autonomous, widely dispersed "battle groups", each one capable of sustaining battle on its own. In February 1955, he published an article explaining why existing battalions and regiments would be replaced with the new divisional organizations. Combat commands would replace regiments, and battle groups would replace

³⁶ Taylor, pp. 152-153.

battalions. Deployment would be cellular rather than linear. Several of Gavin's ideas seemed to mesh with those of General Taylor in the months ahead.³⁷

Three weeks after becoming Chief of Staff, Taylor outlined the principles of organization for the proposed division in a letter to the Continental Army Commander (CONARC had replaced Army Field Forces earlier that year). The only division organic weapons and equipment he wanted were those habitually needed regardless of theater of operation. Furthermore, each headquarters should have the maximum number of subordinate units it could control, "usually...more than the presently customary three". Finally, he directed that equipment should be pooled one or two echelons above the probable level of employment, but items only occasionally required by a division should be pooled at the field army level.³⁸

By December 1955, Continental Army Command completed the "Doctrinal and Organizational Concepts for an Atomic-Nonatomic Army During the Period 1960-1970", short title PENTANA Army, and

³⁷ Robert A. Doughty, The Evolution of US Army Tactical Doctrine, 1946-76, Leavenworth Papers (Fort Leavenworth, Kansas: US Army Command and General Staff College, 1979), p.16.; "New Divisional Organization," Army-Navy-Air Force Register Vol. 76, No. 3923 (Feb. 12, 1955): pp. 1-2.

³⁸ Letter, Chief of Staff to Commanding General, CONARC, no subject, 21 July, 1955, General Maxwell D. Taylor files, MHI.

forwarded it to General Taylor. The ATFA-1 test divisions had yet to complete their field tests.

PENTANA envisaged a universal, completely air transportable division of 8,600 men to replace existing infantry, airborne, and armored divisions. The new division was structured around five fully integrated, self-sufficient combat groups, designed to meet the requirements for dispersion, flexibility, and mobility (see p. C-6).³⁹

Even before the PENTANA Study was completed, General Taylor directed the reorganization of the airborne division along lines that would eventually be reflected in the study's recommendations. In September 1955, he suggested a division of ten to twelve thousand men with five battle groups and nuclear weapons. By mid December CONARC submitted a proposal for an airborne division that incorporated features from both the PENTANA and the ATFA-1 studies. It included five battle groups instead of combat commands and battalions. It also replaced the engineer and reconnaissance units omitted by PENTANA. There were no intervening headquarters between the division and the battle groups.

³⁹ Doctrinal and Organizational Concepts for an Atomic-Nonatomic Army During the Period 1960-1970 (C), Short Title: PENTANA Army, Abridged Copy (Fort Monroe, VA: U.S. Continental Army Command, 10 May 1957), p.4.

Redesign actions moved swiftly from that point. In February 1956, General Taylor approved the hybrid airborne division design. In April he rejected the recommendations of the ATFA-1 studies completed earlier that year. In his opinion, the ATFA-1 units were not sufficiently austere and did not give enough attention to the employment of tactical nuclear weapons. That same month, the 101st Airborne Division moved to Fort Campbell, Kentucky to reorganize and test the hybrid design which eventually came to be called the PENTOMIC division. Taylor approved the PENTANA study, with modifications, on 1 June 1956, as an objective for research and development. He stated that "PENTANA, as modified, should be put on the wall as an objective toward which the Army will progress. The gap will be filled by a series of evolutionary, modified versions". In the meantime, airborne, infantry, and armor divisions would be necessary.⁴⁰

Pressured by the Chief of Staff, the Army reorganized its divisions into the Pentomic design which was not as lean as advocated by PENTANA but incorporated many of the more radical features of that concept. The pentagonal division structure had a nuclear capability and organized itself around five "battle groups" that were smaller than the old regiments but larger than the battalions they replaced. Each battle group had five rifle

⁴⁰ John Wilson, Divisions and Separate Brigades, pp. 310-315; Letter, Chief of Staff to Commanding General, Continental Army Command, subject: Army Organization, 1 June 1956, General Maxwell D. Taylor Files, MHI.

companies and a mortar company. Units were small to enable them to move on short notice, were mostly air transportable, and took advantage of newly developed missiles and rockets that increased unit firepower. In theory the five-unit design allowed the commander greater flexibility and permitted independent tactical action as opposed to mutually supporting tactics characteristic of linear operations. The battle groups combined "the self-sufficiency and firepower of the standard regiment with the size of a reinforced battalion, thus increasing the span of control of the division commander and providing greater flexibility in the conduct of operations on an atomic battlefield" while improving nonatomic war capability.⁴¹

Three different Tables of Organization and Equipment (TOE) emerged: ROTAD, ROCID, ROCAD. The airborne division was organized under the ROTAD (Reorganization of the Airborne Division) TOE (see p. C-7), initially published in August 1956. This provided for a unit strength of 11,486 men, down from 17,085. For the first time, all men and equipment of an airborne division, except for the Honest John unit, could be transported by air.⁴²

⁴¹ Semiannual Report of the Secretary of Defense, January 1 to June 30, 1956 (Washington: GPO, 1957), p. 87, pp. 80-89.

⁴² Semiannual Report of the Secretary of Defense, January 1 to June 30, 1958 (Washington: GPO, 1959), p. 106; John Wilson, Divisions and Separate Brigades, pp. 315-321.

The infantry division was organized under ROCID (Reorganization of the Current Infantry Division) TOE (see p. C-8), first submitted in October 1956. It set unit strength at 13,748 men, as opposed to 17,459 previously. With less and lighter equipment it was to be as air-transportable as possible. The initial test TOE had a single small brigade headquarters whose purpose, according to TOE 7-2t ROCID, dated 20 December 1956, was to provide command and control of attached elements as directed by the division commander, and to act as an alternate division headquarters in the event of an emergency. Nothing indicates that this headquarters was ever seriously utilized in either role, and when TOE 7D replaced 7-2t in February 1960, the single brigade was eliminated.

Only the airborne and infantry divisions were, in fact, reorganized under the true Pentomic design of five battle groups. Reorganization of the armored division under the ROCAD (Reorganization of the Current Armored Division) TOE (see p. C-9), approved in December, 1956, made no significant changes to the existing design except to add nuclear capability with Honest John rockets. Armored divisions retained their combat command structure, and unit strength was reduced by only 66 slots, to an authorization of 14,617 men.⁴³

⁴³ Ibid.

The Army officially implemented the new organization to make the division readily adaptable to the requirements of the atomic battlefield. As General Taylor stated in a speech to Army school commandants, "That requirement was number one - the ready adaptability to these new battlefield requirements." The planners strove to develop a design that would allow the separation of units which could survive independently while not presenting lucrative targets for a nuclear attack. The new design would allow greater mobility, streamline staff procedures, and produce a more flexible organization. Another official reason was to have units capable of adopting new weapons.⁴⁴

The real reason for the design change was to protect the army budget. Logically, the triangular division could have been updated to meet the needs of the nuclear battlefield. Indeed, the armor divisions never altered their basic design. Moreover, only four years later, in 1961, the Army converted all its divisions to the ROAD design which was an updated and improved triangular division.

⁴⁴ Maxwell D. Taylor, Speech Before the Army School Commandants, Room 2E715A, Pentagon, Washington, D.C., 28 February 1957. Copy in the Maxwell D. Taylor papers, Box 1, MHI, Carlisle Barracks, PA.; Interview with General Melvin Zais, USA Retired, by Colonel William L. Golden and Colonel Richard C. Rice, Senior Officer Oral History Program, Project 77-3, Volume II, 1977, MHI collection; John H. Cushman, "Pentomic Infantry Division in Combat," Military Review 37 (January 1958):19-30.

In 1955, however, Army budgets were being starved for appropriations to finance Air Force and Navy modernization. The Army needed to enhance and modernize its image as a contributor to nuclear warfare. General Gavin, while Assistant Chief of Staff, G3, wanted an organizational structure that would justify more money for Army research and development. According to General William Westmoreland, then Secretary of the General Staff, President Eisenhower himself told General Taylor that he needed to "sex up the Army", and give it more public charisma.⁴⁵

The Pentomic design did "sex up the Army" and justified demands for more manpower and resources. The PENTANA Study itself maintained that "changes in tactical and organizational concepts necessitate the development of new weapons systems and equipment".⁴⁶ The Secretary of the Army, in his semi-annual report for 1956 noted that the new division design "will not lessen the overall manpower needs", but would increase them because of the additional "manpower required for supplying and resupplying widely dispersed units".⁴⁷

⁴⁵ Interview with General Zais, p.338; Interview with General William C. Westmoreland, USA retired, by LTC Martin L. Ganderson, Senior Officer Oral History Program, Project 1982-F, vol I, 1982, MHI collection, p.32.

⁴⁶ PENTANA Study, p. 5.

⁴⁷ Semiannual Report of the Secretary of Defense, January 1 to June 30, 1956, p. 85.

Even General Taylor acknowledged that the need to enhance the prestige of Army budgetary requests led him to "conjure up the Madison Avenue adjective" (Pentomic) to describe the new division. In his words, "nuclear weapons were the going thing and, by including some in the division armament, the Army staked out its claim to a share in the nuclear arsenal", and with it, the defense budget.⁴⁸ Westmoreland says General Taylor had to do "something new, to give the Army a modern look". General William E. DePuy supports Westmoreland's view, arguing that the Pentomic Division was Taylor's answer "to the fact that the Army seemed left out, and the Army needed to sound and appear very modern, and Pentomic was thought to be one way to do that."⁴⁹

Given the reasons behind its development, Army planners saw the Pentomic division from its inception as a transitional design. The Army completed the conversion to the Pentomic army by 1960, but even before that time numerous weaknesses made it unsuitable for the modern battlefield. General Hamilton Howze, Commander of the 82d Airborne Division, thought the five-sided organization made no sense in creating either a line or a holding force. At the same time it lacked sufficient support units at division level, forcing Howze to rob line units to strengthen

⁴⁸ Maxwell D. Taylor, Swords and Plowshares, p.171.

⁴⁹ Interview with General William E. Depuy, USA retired, by LTC. Bill Miulle and LTC Les Brownlee, Senior Officers Debriefing Program, 1979, MHI Collection, p. 32; Interview with General Westmoreland, Senior Officers Debriefing Program, p. 32.

support ones. Simply put, the Pentomic division lacked staying power. Battle groups were not large enough to conduct a sustained attack nor an aggressive defense. The elimination of the battalion had actually decreased flexibility. Artillery support was woefully inadequate. Companies were too large to control and tactically deploy with efficiency, and the commander's span of control at all levels was too great given existing communications technology. Staffs were too small to support the combat units properly. Finally, the organization was too oriented to a nuclear battlefield and could not operate effectively in conventional combat.

There were administrative problems as well. Units did not have adequate personnel to perform the numerous peacetime functions around post and still train well. Without a battalion echelon, troop assignments for officers in the grade of major evaporated and there were no command slots between captain and colonel. This was seen as a critical shortcoming to professional development and even to the combat readiness of the officer corps.⁵⁰

⁵⁰ Wilson, p. 324; Interview with General Depuy, Senior Officer Debriefing Program, p.34.; Interview with General Westmoreland, Senior Officer Oral History Program, p.33.; Interview with General Hamilton Howze by LTC Robert Reed, Senior Officers Debriefing Program, MHI collection, 1972, pp. 6-7.; Ney, p. 74.; John C. Binkley, "A History of US Army Force Structuring," Military Review LVII, No.2 (Feb. 1977): 78.

MODERN MOBILE ARMY 1965 (MOMAR I) (1959-1960)

By late 1958, Army force designers recognized that the universal PENTANA division employing sophisticated equipment could not be achieved by 1960-1970. Army planners also recognized the shortcomings of the hybrid Pentomic design. Thus in January 1959, General Bruce C. Clarke, Commanding General, United States Continental Army Command (CONARC), directed the preparation of a study entitled "Modern Mobile Army 1965-70 (U) (Short Title: MOMAR I (U)). Officers completed the first draft by July 1959, then widely coordinated and revised the work before submitting it to a General Officers Board for review. Clarke approved the study and sent it to the Department of the Army in February 1960 for approval as "a single, long-range unifying objective for modernizing the Army in the field" which agencies could use when considering changes beyond 5 to 6 years in the future.⁵¹

General Clarke believed that the Army needed to be capable of fighting nuclear and conventional wars anywhere in the world against a variety of foes. Its units had to be able to fight independently, or semi-independently, and thus the Army had to increase conventional firepower beyond that existing in the Pentomic division. Tactical mobility, maneuverability, use of

⁵¹ Modern Mobile Army, 1965-70 (U) (Short Title: MOMAR I (U)), (Fort Monroe, VA: United States Continental Army Command, 10 February 1960), pp. i - iii. Hereafter cited as MOMAR I.

armor-protected vehicles, and a unit design that could easily incorporate new weapons as they came available were the hallmarks of the new design.⁵²

Clarke's influence was readily apparent in the finished study.⁵³ Mechanization received heavy emphasis. MOMAR I eliminated corps by having the field army directly control its divisions. It required only two type divisions--heavy and medium, roughly corresponding to armor and mechanized infantry--both of which would be completely mounted in organic vehicles (see p. C-10). To provide a rapid strategic intervention capability otherwise unavailable with such heavy forces, the study also envisioned Air Transportable Brigades (to succeed airborne divisions) and Fire Support Brigades.⁵⁴

The divisions had five self-sustained combat commands. These combined arms organizations were a hybrid of the regiments and combat commands of WW II, and retained much of the

⁵² Wilson, Divisions, p. 337.

⁵³ LTC George Dramis, a trusted assistant to General Starry, in a memorandum for Starry wrote, "The entire organization could have been designed by reading the battle of St. Vith. It was uniquely and solely influenced by General Clarke. The use of combat commands, task forces, no DIVARTY, self-contained artillery support, no mess teams and limited support were all characteristic of Gen Clarke's experiences in World War II." Memorandum For: General Starry, ATCG, Headquarters, United States Army Training and Doctrine Command, subject: Historical Background on Three Versus Four Companies, dated 16 May 1979.

⁵⁴ MOMAR I, Chapters 2-4.

flexibility inherent in the latter. The adaptable armor combat commands, so successful in World War II, had survived the Pentomic challenge, and now appeared in MOMAR I, which moreover assumed internal tailoring to meet the needs of the particular mission. Commanders could assign armor, mechanized infantry, and motorized infantry companies to the three task force headquarters of each combat command. MOMAR I was not as flexible as the later ROAD design but it did foreshadow the "building block" idea the Army eventually adopted.⁵⁵

In April 1960, CONARC transferred responsibility for coordinating continued development of the MOMAR concept from the Office of the Deputy Chief of Staff for Combat Developments, USCONARC, to the U.S. Army Command and General Staff College. A study group at CGSC that was filling in and refining the MOMAR I concept before DA approval, emphasized that the Army had to be ready to fight in any environment, ranging from limited war without nuclear weapons to general nuclear war. The standard division organizations of MOMAR I were not flexible enough to respond to "all the widely varying possibilities of operational environment and terrain." With that in mind, the group specifically suggested the creation of divisions that could be custom-made to fit particular operational needs.⁵⁶

⁵⁵ Ibid.; Doughty, "Evolution", p.20.; Wilson, Divisions, p.337.

⁵⁶ MOMAR I, pp. ii-v.; Doughty, "Evolution", p. 20.

MOMAR I reached a dead-end because its heavily mechanized forces were unsuited for use in many potential trouble spots. It was never tested or subsequently developed. General Clyde D. Eddleman, Army Vice Chief of Staff, thought the design lacked the "simplicity, homogeneity, versatility, and flexibility required by the Army for its diverse, worldwide tasks in the coming decade." Accordingly on 16 December 1960, he directed the new Commanding General of CONARC, Gen Herbert B. Powell, to abandon MOMAR and conduct a study to develop Army divisional organization requirements in the 1961-1965 period.⁵⁷

THE ROAD DIVISION (1960-1961)

The quest for increased flexibility again drove the push for a new division design. Although the Pentomic divisions enjoyed a wide span of control, their fixed composition precluded easy, effective task organizing to meet changing situations due to the enemy, mission, terrain, climate, and use or non-use of nuclear weapons. The design bias toward nuclear war caused reduced capabilities in conventional combat, and battle groups were too small to sustain offensive operations, but too large to provide real organizational flexibility. The MOMAR divisions did not provide the needed improvements. In their own way they were as

⁵⁷ Quoted in Doughty, "Evolution", p. 20.; Reorganization Objective Army Divisions 1965 (ROAD 65) (U), (Fort Monroe, VA: United States Continental Army Command, 1 March 1961), p.i. Hereafter cited as the ROAD study.

deficient as the Pentomic divisions in providing options because their extensive mechanization made them too heavy for strategic airlift and limited their usefulness in many possible contingency situations.

The Army also wanted more options in the area of personnel utilization than the Pentomic division provided. Planners believed that "similar assignments in all type of divisions needed to be standardized for efficient training and assignment of personnel", and hopefully a new design could furnish this standardization.⁵⁸

Two major changes in the national strategic outlook occasioned another demand for a new divisional design. First the shift in strategic doctrine from massive retaliation to flexible response placed a premium on ground forces. Second, the new president, John F. Kennedy, believed, as did the Army leadership, that the most likely form of future combat would be a localized, limited war, roughly analogous to the Korean conflict.⁵⁹

⁵⁸ Forrest K. Kleinman and Robert S. Horowitz, The Modern United States Army (Princeton, NJ: D. Van Norstrand Co., 1964), p. 91.; Weigley, pp. 540-542.

⁵⁹ Weigley, p. 542.; Binkley, "A History of US Army Force Structuring", p. 78.

General Eddleman ordered the planners of the new study to consider infantry, armored, and mechanized divisions. While all divisions needed nuclear and conventional weapons, he wanted them tailored to adapt to different environments. They could not exceed 15,000 men and would be as similar as possible. The planners had to balance the retention of battle groups against a return to battalions with an intervening headquarters between the division and battalion. Eddleman's guidance implied his preference for interchangeable battalions. Planners had until 1 March 1961 to submit their design.⁶⁰

As with the PENTANA and MOMAR I studies, an individual's previous experience played a major role in the outcome. Eddleman's guidelines to CONARC represented the fruition of ideas he developed while he was commander of the United States Army, Europe, and Seventh Army where he was involved with the establishment of the Federal Republic of Germany's Army. The Germans adopted a building block approach to organization without infantry and armored divisions per se. Instead, they used infantry and armored brigades to form divisions that were tailored for specific missions. Although the brigades were fixed, they could add battalions to form the type team they

⁶⁰ Wilson, p. 338; United States Army Training and Doctrine Command, ATCG, Memorandum For: General Starry, subject: Historical Background on Three Versus Four Companies, dated 16 May 1979, p.2.

wanted.⁶¹ An improved version of this concept appeared as the ROAD Study.

Eddleman apparently had his own team at CONARC to work on the directed study. Early in 1960, he sent the MOMAR I study to the Army War College for review by three colonels, George Sedbury, John Honea, and Robert Kendrick. In June 1960, these three officers were assigned to CONARC where Sedbury became Chief of Organization Division and the other two worked for him. Sedbury "ghosted" General Eddleman's December letter directing the abandonment of MOMAR and the initiation of a new study. In other words, Eddleman's hand-picked team was quickly able to produce a new force design initiative. By 10 January 1961, CONARC briefed the Vice Chief of Staff on the ROAD 65 concept, complete with type organization.⁶² In a little more than three weeks, most of it during the holiday season with its traditional two-week "half-day-schedule", they had completed detailed conceptual outlines of an extensive division reorganization project. Headquarters CONARC then worked with the Command and General Staff School and the service schools to refine the new organizations and concepts. They presented the final study to the Commanding General USCONARC on 14 February 1961. In March 1961, General Herbert H. Powell, CONARC commander, submitted

⁶¹ Wilson, p. 339.

⁶² United States Army Training and Doctrine Command, ATCG, Memorandum For: General Starry, subject: Historical Background on Three Versus Four Companies, dated 16 May 1979, p.2.

"Reorganization Objective Army Divisions 1965 (ROAD 65) (U)" to General George H. Decker, Army Chief of Staff, for approval.⁶³

The ROAD 65 study focused only on the reorganization of the infantry and armored divisions (airborne was added later) and the creation of a mechanized division. It did not address a general reorganization of the Army as had PENTANA, and MOMAR I.⁶⁴ The study proposed a standardized organization to facilitate training, and tactical and strategic tailoring, yet be flexible enough to integrate new weapons and equipment as they became available. The proposed ROAD divisions were similar to the combat tested and proven triangular division, but still represented a radical, far more flexible departure from the pre-WWII prototype. "The concept of interchanging battalion-sized combat maneuver units within and between divisions [was] the basis for ROAD-65 divisional structure." The primary improvement over the old combat commands was a common division base, and combat maneuver battalions that were nearly the same in organization and were administratively and tactically self sufficient.⁶⁵

⁶³ ROAD Study, p. i.; Wilson, p. 339.

⁶⁴ This, and the following discussion of the ROAD division come from the following sources: ROAD Study, pp. 5-10; Wilson, pp. 339-345; Doughty, "Evolution", pp 21-23; Ney, p.76.

⁶⁵ ROAD study, pp. 5-9.

Fundamental to the entire design concept was a common division base that allowed the commander to assign a varying mixture of combat maneuver battalions. The common base included a division headquarters and headquarters company, a military police company, an aviation battalion, a division artillery, a reconnaissance squadron, an engineer battalion, a signal battalion, a support command, and three brigade headquarters and headquarters companies.

The predominant type of combat maneuver battalions added to the base determined the type of division. Armored divisions, for example, had six tank and five mechanized infantry battalions; infantry divisions had eight infantry and two tank battalions; mechanized divisions had seven mechanized and three tank battalions (see pp. C-11/12/13). Each type division had about 15,000 men. A commander could task organize by using various mixtures of battalions among and within divisions, and create combined arms task forces by cross-attaching tank and infantry companies.

The three brigade headquarters assigned to each division reflected the influence of the old armored division combat commands. The brigade headquarters did not have any assigned units like the old infantry regiment. Planners intended for the brigade to serve as a tactical headquarters capable of controlling the operations of two to five attached maneuver

battalions, but not to enter into administrative channels between division and battalion. Battalions would coordinate directly with the division on administration matters.

Battalions became the lowest level of tactical and administrative self-sufficiency -- "the smallest unit capable of self-sustaining combat operation[s]".⁶⁶ Each battalion was to be one combat arm, but all maneuver battalions were as similar as possible. Each would have three line companies, and a similar headquarters, headquarters service company (with a mortar platoon, reconnaissance platoon, and support capability). This uniformity of design permitted units to interchange or exchange companies and platoons with minimum turmoil.

Two other significant changes accompanied the ROAD design. First, it established a division support command where all the technical and supply elements were organized into one unit to operate functionally, instead of by their separate branches. For the first time, the division had a senior commander in direct charge of all logistics. Second, there was the significant increase in aviation assets. The new division had twice as many aircraft as its Pentomic predecessor.

Whereas the Pentomic division was implemented more in response to outside pressures than for tactical reasons (the Army

⁶⁶ ROAD study, p. C-5.

was unable to balance external demands with the needs of tacticians), the ROAD division reorganization put the Army firmly back on the track of making cumulative improvements on previous combat-tested designs. The Pentomic design lacked flexibility and mobility due to span of control problems, lack of organic personnel carriers, and an inability to adequately fight a conventional war. ROAD provided divisions that emphasized the conventional battlefield, were fully mobile, and "provided a homogeneous structure that [was] versatile, flexible, and simple".⁶⁷ The new design also reflected the increased national emphasis on flexible response and a conventional military build-up that could defend Western Europe without resort to nuclear weapons. ROAD allowed even greater dispersion of its units than did the Pentomic division but with less threat of loss if a battalion suffered a nuclear attack.⁶⁸ Finally, the return of the battalion solved the agonizing problem created by the Pentomic division of what to do about the professional development in troop assignments and command positions for the Army's majors and lieutenant colonels.

The ROAD Division was not without its critics. Lieutenant General Garrison Davidson, as First Army Commanding General in 1964, asserted that the ROAD division had been implemented

⁶⁷ ROAD Study, p. 9.

⁶⁸ The ROAD study noted that the loss of a battle group represented 20% of the division's strength, whereas the loss of one battalion was only 11% of the division strength (p. A-3).

without adequate study. The division had "more flexibility than will ever be used", and it was purchased at the cost of unit heritage and tradition. According to General Davidson, "The ROAD concept reduces once proud organizations, steeped in tradition, to meaningless entities." He expressed concerns that this would ultimately affect coordination and teamwork within combat units, and a more thorough analysis of the design before implementation could at least have alleviated concerns. General Davidson's criticism was censored by the Army on policy grounds, and the Pentagon even vetoed publication in Military Review of an article by him on the subject.⁶⁹

AIR ASSAULT DIVISION (1962 - 1965)

The first divisions to organize under ROAD in February 1962 were the newly activated 1st Armored Division and the 5th Mechanized Division. The last division to switch to the new design did so in 1964. Before the first units had converted, however, a move was underway to establish a special variation to the ROAD division.

During late 1961 and early 1962, Secretary of Defense Robert S. McNamara and his staff thoroughly reviewed the Army's aviation requirements. Believing that efforts in the field were limited

⁶⁹ "Army Censors General's ROAD Criticism," Army Navy Air Force Journal and Register 101 (16 May 1964): 1, 7, 10, 38.

and overly conservative, the Secretary instructed Army leaders to examine their aviation requirements with a more audacious look at land warfare mobility and to ensure that the study was "divorced from traditional viewpoints and past policies, and free from veto or dilution by conservative staff review".⁷⁰ Less than a week after McNamara's April memorandum, CONARC appointed General Howze as president of the ad hoc U.S. Army Tactical Mobility Requirements Board, generally known as the Howze Board.

The Howze Board submitted its final report to the Secretary of Defense on 20 August 1962. Its major recommendation was a call to form an air assault division. This division would have 459 aircraft (both fixed and rotary wing, compared to about 100 in other ROAD divisions), allowing it to airlift one third of its assault element simultaneously. The division sliced its wheeled and tracked vehicles from over 3,400 to 1,100. Artillery support consisted of only 105-mm howitzers and Little John rockets, but was augmented by twenty-four armed Mohawk aircraft and 36 Huey helicopters armed with 2.75-inch rockets. The air assault organization followed the ROAD division model with three brigade headquarters to which maneuver battalions and support elements were assigned depending on mission and terrain.

⁷⁰ John J. Tolson, Airmobility 1961-1971 (Washington: GPO, 1973), pp. 17-18.

The Board also recommended the organization of air cavalry combat brigades (ACCB) for screening missions, reconnoitering, and fighting delaying actions. These brigades would have 316 aircraft (144 attack helicopters) but no organic infantry units for ground combat.⁷¹

Tests of the Howze Board recommendations began at Fort Benning, Georgia, with the activation of the 11th Air Assault Division (Test) in February 1963. The full scale tests concluded in October and November 1964 when the test director recommended that air assault divisions be added to the Army's permanent force structure. Secretary of Defense McNamara approved the recommendation, overriding the strenuous objections of the Air Force Chief of Staff who thought the concept infringed on the Air Force mission.

The Army Staff selected the 1st Cavalry Division to form the first airmobile division (see p. C-14). On 1 July 1965, the 1st Cavalry Division, less personnel and equipment, moved to Fort Benning, where it absorbed the personnel and equipment of the 2d Infantry Division and the 11th Air Assault Division. The 2d Infantry Division flag moved to Korea to replace the old 1st Cavalry. The next month the 1st Cavalry Division (Airmobile),

⁷¹ Ibid., pp. 22-24.

the Army's first airmobile division, deployed to Vietnam and the test of combat.⁷²

Battlefield mobility was the reason behind the call for this new division design. One man made it happen: Robert McNamara. Without the direct intervention and support of the Secretary of Defense, Army aviation disciples could not have overcome opposition of opponents within the Army and Air Force. McNamara's concern for increased mobility was clear in 1962, when he wrote: "I shall be disappointed if the Army's reexamination merely produces logistically oriented recommendations to procure more of the same, rather than a plan for employment of fresh and perhaps unorthodox concepts which will give us a significant increase in mobility."⁷³ This desire to overcome the limitations imposed by ground movement and to exploit the mobility potential of emerging aeronautical technology, perhaps with an eye to its application on Southeast Asia battlegrounds, were the determining factors in the decision to design an airmobile division.

TRICAP (1971-1974)

Beginning in 1972 the Army tested another variation of the ROAD division. On 5 May 1971, it reorganized the 1st Cavalry

⁷² Ibid., pp. 61-62.; Wilson, pp.360-363.

⁷³ Quoted in Tolson, p. 19.

Division at Fort Hood, Texas as the 1st Cavalry Division (TRICAP). This experimental organization (see p. C-15), consisting of an armored brigade, an airmobile brigade, an air cavalry combat brigade and a division base, was "expected to adapt the highly successful airmobility experience gained in Vietnam to more traditional battlefield environments".⁷⁴ The Modern Army Selected Systems Test, Evaluation, and Review (MASSTER) facility evaluated both the division and the Air Cavalry Combat Brigade (ACCB) organization.

The 1st Cavalry Division (TRICAP) was activated at Fort Hood, Texas, on 5 May 1971, and the TRICAP (triple capability)/ACCB tests began in February 1972. The tests ended in FY 1974. After a Combat Developments Command evaluation, the 1st Cavalry Division was reorganized with two armor brigades and one air cavalry combat brigade. In March 1974, however, the Army decided to organize the 1st Cavalry as a standard armor division, and make the air cavalry combat brigade a separate formation.⁷⁵

This short-lived design initiative resulted from the increased focus on the Soviet threat in Europe following the Vietnam War. TRICAP attempted to adapt the newest combat capabilities (attack helicopters and airmobile elements) to the

⁷⁴ Department of the Army Historical Summary, Fiscal Year 1973 (Washington: GPO, 1977), p. 49.

⁷⁵ Ibid.; Wilson, pp. 415-417.

mid-intensity level of war. These new weapons were effective in Vietnam, but their effective employment in a more lethal European environment remained questionable. The Army concurrently was "looking for ...a revolutionary increase in combat power through a new combination of air cavalry, tanks, attack helicopters, mechanized forces and airmobile infantry and artillery."⁷⁶

Another imperative of the renewed focus on Europe was the desire to refine doctrine to meet the tremendous technological changes that had occurred since the early 1960's when ROAD was first introduced. This led to "a clear need for improvement in tactical doctrine"-- doctrine that had its origins in World War II, with only slight modifications during the following two decades. This earlier doctrine did not adequately address the changes mandated by improved air defense weapons, more accurate and lethal antitank weapons, longer range artillery, and a myriad of improvements in communication, navigation, mobility, and intelligence gathering ability. The TRICAP test was one step in the growing effort to bring the Army's doctrine into line with a technological revolution in military equipment.⁷⁷

DIVISION RESTRUCTURING STUDY (1975-1979)

⁷⁶ John L. Norton, "TRICAP," Army 21 (June 1971), 14-15; Department of the Army Historical Summary, Fiscal Year 1972 (Washington: GPO, 1974), p. 56.

⁷⁷ Doughty, "Evolution", pp. 42-43.

The Vietnam War cost the Army a generation of weapons modernization. By the mid-1970's, however, the Army had accelerated its procurement programs to draw abreast of the Soviet Union in new weapons development as the strategic focus shifted to Europe and the Warsaw Pact threat.

In mid-1975, TRADOC began an analysis of the suitability of current Army divisions to meet the Warsaw Pact challenge. It soon realized that more was needed than adjustments and adaptations to a basic design. In October 1975, General William E. DePuy, the TRADOC Commander, wrote to General Frederick C. Weyand, the Army Chief of Staff, suggesting that unit organizations be based on weapon systems and tactics. In March 1976, the Department of the Army directed TRADOC to undertake a formal restructuring effort and, on 4 May 1976, General DePuy formed a special Division Restructuring Study (DRS) Group under his direct control.

The Division Restructuring Study recognized that the ROAD organization made inefficient use of the weaponry of the 1970's, and voiced concern that the structure could not handle the new weapons programmed for the 1980's. Also, the ROAD design could not keep pace with tactical changes emerging from weapons advances like the anti-tank missile. The unprecedented lethality of the 1973 Arab-Israeli War accelerated weapons modernization programs and led to profound changes in Army doctrine and

training. The logical next step was to adjust tactical organizations to the new weapons potential and doctrinal demands.⁷⁸

The DRS Group was supposed to determine the optimum size, mixture and organization of U.S. Army armored and mechanized infantry divisions for 1980-85 (see p. C-16). Weapons systems and the best mode of employment determined force design. DRS would integrate the new weapons to ensure their optimum use when and where most needed on the battlefield. Trends in firepower and personnel employment over the last hundred years were key to any design. The 1983 Mechanized Division would have six times the combat power of its World War II predecessor. Simultaneously, indirect fire techniques and air delivered munitions greatly increased the demands on the battlefield commander as he attempted to integrate all elements of the combined arms battle. Greater dispersion required greater mobility to mass defenders quickly at a threatened breakthrough point, and the increasing complexity of war demanded more combat service and combat service support to supply and maintain the new weaponry. This development continued a trend of reducing the number of fighters relative to combat supporters.⁷⁹

⁷⁸ John L. Romjue, A History of Army 86. Volume I. Division 86: The Development of the Heavy Division (Ft. Monroe, VA: United States Army Training and Doctrine Command, June 1982), pp. 2-4.

⁷⁹ Division Restructuring Study. Phase I Report, Vol I, Executive Summary (Ft Monroe, VA: U.S. Army Training and Doctrine Command, 1 March 1977), pp. V and 2-6.

Planners identified a number of institutional problems facing current TOE divisions. Already overburdened company commanders had to integrate fires of the combined arms team on the battlefield, despite their inexperience. Artillery was outnumbered by Soviet guns and insufficient for a modern battle. The mission of the engineers was too diversified and not focused on mobility and counter-mobility missions. Weapons were added to existing organizations to "tag along" even if this meant inefficient employment of men and material. The Army had to switch from its traditional organizational orientation that integrated new systems into existing units to a system that oriented combat and support organizations toward particular weapons systems.⁸⁰

On 16 July 1976, TRADOC briefed General Weyand on the pilot study concept for a proposed heavy division. Weyand endorsed the concept for further discussion, evaluation, and testing. Many of the ideas were innovative, some controversial, and a number of the recommendations would eventually be adopted by the Division 86 study. Major features included:⁸¹

** Divisions would continue to have three brigades but each brigade would be substantially larger, having three tank and two

⁸⁰ Ibid.

⁸¹ Ibid., pp. 11-16.; Romjue, pp. 6-7.

mechanized infantry organic battalions. The same artillery unit would habitually support the same brigade and combat service support would be organized and habitually attached to support specific battalions.

** A Deputy for Personnel and Logistics and a Deputy for Operations and Intelligence appeared on TOE's for brigade and battalion level to provide more control and supervision.

** Weapons were grouped as company organizations, i.e., a tank company, TOW company, mechanized infantry company, etc. Each armor battalion and mechanized infantry battalion had a separate long range anti-tank guided missile company.

** Tank platoons were reduced to three tanks. Infantry squads dropped to 9 men from 11.

** Because he had more experience, the battalion commander would integrate and coordinate fires rather than the company commander. As a rule, the battalion would be the lowest level of cross attachment. The new division consolidated its mess and administration at battalion level and by freeing the company commander from those responsibilities allowed him to devote full attention to fighting the battle.

** Each brigade had one direct support artillery battalion with four firing batteries of eight guns each. Each artillery battalion increased from three batteries to four and each battery from six tubes to eight for an overall increase of 14 guns.

** The Division Air Defense Artillery (DIVADA) received all air defense assets.

** The newly established Combat Aviation Battalion consolidated the reconnaissance squadron's aviation troop, the division command and control aircraft, and an attack helicopter company.

A DA staff critique of the DRS proposal was mixed although all offices favored testing. The reviewers had strong reservations about General Weyand's proposal for only a one year test during 1977-78. They favored a longer four-year study, and a slower restructuring pace to allow the integration of new weapons into the redesigned division as they became operational. On 24 January 1977, General Bernard W. Rogers, the new Chief of Staff, approved the original testing concept with the 1st Cavalry Division as the primary test unit.

After the tests (known as the Division Restructuring Evaluation) began, strong support emerged for the brigade-organic battalions, integration of combined arms at battalion, and

smaller, single-purpose maneuver units. Yet serious doubts remained that the three-tank platoon was too small; that the division depended too much on external CSS; that it lacked scouts in its maneuver battalions; and that the brigade's span of control was too large. On 1 July 1977, General Donn Starry succeeded General DePuy as TRADOC commander. Starry supported the need to reorganize the Army's heavy divisions, but shared strong misgivings about the effectiveness of a three-tank platoon and the notion that the restructuring was predicated on new weapons not yet in the Army's inventory. How could tests be conducted before these weapons were delivered? He was also worried about inadequate testing of the concept because not only was wargaming insufficient, but logistics and close air support had been neglected.⁸²

The Chief of Staff approved a new testing schedule in September 1977, with a final review set for October 1979. By the end of 1977, General Starry's misgivings had expanded into a general critique of DRS and its rationale. He believed that the study was done too quickly using too few people and with too little critical analysis. For instance, the tests which supported the three-tank platoon were flawed. Units improperly trained in the new three-tank tactics exercised against opposing forces who were poorly trained in obsolete Soviet tactics under poor control and improper conditions to assure the validity of

⁸² Romjue, pp. 7-11.

test data. Furthermore, the DRS group at TRADOC had not adequately involved center and school commanders.⁸³

Starry's influence and his ideas revised the Division Restructuring Study. Test plans were reduced through 1977 and 1978 as he forced a more deliberate approach to the division design problems. He injected "major analytical-planning dimensions" on the testing organization "that were focused on [his] view or theory of the battlefield as formulated in a 'Battlefield Development Plan'". DePuy and the DRS planners had emphasized the tactical level in their restructuring concept. Starry went beyond tactics in his concern about the operational level above division. The division design, he believed, could not be separated from the "broader and deeper operational problems". The Battlefield Development Plan centered developers' work in assessing the division's weaknesses for each battlefield task and in conducting methodical and detailed analysis of weapons programs supporting each task.⁸⁴

As tests proceeded on DRS, the TRADOC staff developed a more systematic approach to outline a strategy for the allocation of scarce resources. This process eventually led to the formalization of the Air-Land Battle doctrine and directly

⁸³ Ibid.

⁸⁴ Ibid. pp. 11-16.

influenced future force design efforts. In the short term it was the death knell for the Division Restructuring Study.

The Division Restructuring Evaluation (DRE) ended in October 1978. Among its conclusions were that integrating combined arms at battalion level was effective, but cross attachment at company level was an option worth retaining; that a four-tank platoon was superior to either the five- or three-tank variety; that scouts were necessary at both battalion and brigade; and that four firing batteries of eight howitzers each were superior to the "three by six" structure. Finally, the C-series TOE (the old H-series (ROAD) TOE updated with weapons available in 1986) was better and more cost effective for the offensive, but the new T-series (DRS) TOE was better and more cost effective on the defensive. In short features of both the current and the restructured division warranted inclusion in any new design for a heavy division.

Even while the DRS Brigade level tests were being conducted, in August 1978 General Starry launched Division 86 to build on the DRS and its tests. In July 1979 the Department of the Army followed TRADOC's lead and formally absorbed the Division Restructuring Study into Division 86.⁸⁵

⁸⁵ Ibid., pp. 17, 42-48, and 101.

The motivation behind DRS was to organize divisions in line with new, more effective weapons systems and the emerging tactical doctrine. General DePuy and the DRS planners' overriding concern was about the increased battlefield lethality demonstrated by the Yom Kippur War in 1973. This led them to emphasize the tactical level. Before they could implement their ideas, however, a new TRADOC commander with a different focus overtook their study with a more detailed, organized, and broader-based approach to the problems of force design for the modern battlefield.

DIVISION 86 (1978 - 1980)

Division 86 was probably the most well orchestrated and thorough division design effort ever conducted. When General Starry announced the new design initiative at the TRADOC Commanders' Conference, 31 August-1 September 1978, he described it as building on the Division Restructuring Study, and as something which allowed everything --doctrine, organization, training, and training literature -- to focus on new weapons and equipment. He tasked the Combined Arms Center at Fort Leavenworth to coordinate service school efforts in preparing the Division 86 materiel systems and tables of organization and equipment. Different school centers became proponent agencies to

conceptualize various functions and tasks within the design.⁸⁶ For instance, the Infantry and Armor Centers were responsible for the "target servicing" function for Infantry, Tank, and Aviation battalions and the Cavalry squadron; the Intelligence Center had responsibility for "surveillance/fusion" functions of the CEWI battalion; the Engineer Center and Logistics Center shared responsibility for "force mobility" input. The deadline for their submissions was October 1979.

The fundamental approach began by defining the division's specific tasks and subfunctions, designing organizations to meet those demands, and then combining the disparate units into a coherent, improved division whole. School center task forces fleshed out potential unit organizations which the Combined Arms Center (CAC) at Fort Leavenworth analyzed in varying division combinations. Periodic general officer meetings provided input, guidance, recommendations, and approval to the actions by task forces and CAC, while sorting out unresolved conflicts among the designers.

In October 1979, TRADOC proposed an Objective Heavy Division that General Edward C. Meyer, Army Chief of Staff, approved in principle. His final decision depended upon the outcome of

⁸⁶ Ibid., pp. 17-18. This volume provides a detailed study of the organizations, meetings, findings, suggestions, decisions, and processes involved with the Division 86 study.

studies on the light division, corps, and echelons above corps.⁸⁷ This cleared the path to further testing and wargaming for a final Division 86 design.

The heavy division was specifically designed to have flexibility plus mobility and the strength and resilience to withstand and defeat the echeloned attack of the Warsaw Pact armies.⁸⁸ Superficially the division departed little from the ROAD organization. It had a strength of 19,855 men (armor configuration), with a division headquarters and headquarters company (HHC), three brigade headquarters, combat maneuver elements, a division support command, a reconnaissance squadron, division artillery, and various other support and combat service support companies and battalions. A closer examination, however, revealed a number of significant differences from ROAD.

A fourth brigade sized maneuver headquarters, the air cavalry attack brigade (ACAB), united all divisional aviation. Tank and mechanized battalions had a common base and new organization. Tank battalions were organized with an HHC and four line companies of three platoons of four tanks each. Mechanized battalions had an HHC, a TOW anti-tank company, and four line companies of three platoons of three squads each. The improved division artillery had increased firepower and range

⁸⁷ Ibid., p. 128.

⁸⁸ Ibid., pp. 27, 111.

with three 155 mm. battalions of three batteries of eight guns each, and one battalion of 16 eight-inch howitzers and nine general support rocket system launchers (MLRS). It also enjoyed better survivability, command and control, and counter-battery capability than the ROAD predecessor. The reconnaissance squadron was smaller with a more limited mission, the engineer battalion more mobile with consolidated armored vehicle launched bridges (AVLB's), the air defense battalion consolidated all Stinger anti-aircraft missiles, and the DISCOM (Division Support Command) retained its conventional base but placed critical battlefield support functions into three battalions to provide direct support to maneuver brigades.⁸⁹

In the following months planners made a number of changes to the Objective Division. The chief among them occurred in the Air Cavalry Attack Brigade where two attack helicopter battalions with three attack helicopter companies replaced the two attack squadrons of four air cavalry attack troops. The brigade also gained a cavalry squadron of two aerial and two ground troops--the ground troops came from the division reconnaissance squadron which was eliminated. The command aviation company in the combat support aviation battalion (CSAB) of the brigade was split into a combat support aviation company (troop and supply movement) and a general support aviation company. Other adjustments to the Objective Division involved transferring the finance company to

⁸⁹ Ibid., pp. 111-122.

corps and the nuclear-biological-chemical company from the Division Support Command (DISCOM) to divisional troops. Minor adjustments to sizes and locations within organizations also occurred.

The division relied on the corps for much of its support. A corps field artillery brigade reinforced and supplemented division artillery. Corps engineers provided direct combat support and bridging as well as limited general support for airfields and supply routes. Corps support to the DISCOM depended on the mission and situation, but included evacuation for equipment and casualties, backup DS maintenance, postal support, and almost complete finance support.

On 1 August 1980, General Meyer approved implementation of the newly designed heavy division (see p. C-17). The armor division of six armor battalions and four mechanized battalions would be 19,966 men strong, the mechanized division of five armor and five mechanized battalions would be 20,250 men strong.⁹⁰

The completed design was, according to one authority, "larger than the ROAD-based divisions of the late 1970's, (but) it promised a significantly stronger fighting force, equipped

⁹⁰ John L. Romjue, A History of Army 86. Vol II. The Development of the Light Division, the Corps, and Echelons Above Corps. November 1979 - December 1980 (Fort Monroe, VA.: United States Army Training and Doctrine Command, June 1982), pp. 1 - 17.

with the new generation of military technology that it had been conceived to harness. There were distinct reforms in its leading ideas of maximum firepower forward; forward arming, fueling, and maintenance; composite brigade support battalions; increased leader-to-led ratios; and an improved combining of the arms. It harnessed effectively the combat potential of the powerful 1980's weapons."⁹¹

Several reasons were behind the decision to develop the Division 86 heavy design. Foremost was the need to provide units which would "support the introduction of new equipment", and increase the leader-to-led ratio in order to "adapt the force to the anticipated rapid pace of future combat".⁹² The probable area of conflict also shaped Division 86. The Army moved away from its traditional generic flexible division design to a design to meet a specific foe (Warsaw Pact armies) in a specific area (central Europe). Doctrine was a fourth consideration. This was probably the first time in force design that an emerging doctrine played a major role in a design effort. AirLand Battle doctrine was not officially endorsed until after the approval of Division 86, but General Starry developed the division to match his vision of doctrine. The seeds of the new doctrine developed

⁹¹ Ibid., p. 23.

⁹² Report of the Secretary of Defense Casper W. Weinberger to the Congress on the FY 1984 Budget, FY 1985 Authorization Request and FY 1984-88 Defense Programs (Washington: GPO, February 1, 1983), p. 116.

concurrently with the design effort and each nurtured the other. Starry's vision of future Army doctrine drove the new heavy division design. The doctrinal **concept** in Starry's mind shaped the early Division 86 efforts. Thus, doctrine joined modernization demands, leader-to-led ratios, and the expected theater of battle as a factor that prompted a new heavy division.

FIXED BRIGADE (1978 - 1979)

Concurrently with the design of the Division 86 organization, planners at the Armor School worked on a concept for an independent or semi-independent brigade.⁹³ In December 1978, they disseminated basic concepts to the Division 86 task forces for what came to be known as the Fixed Brigade (see p. C-18). Combined arms battalions made up of organic infantry and armor companies (as opposed to conventional single combat arms battalions that are later task organized) were a fundamental element of the new idea.

Task forces began informal studies with the support of LTG Roy Thurman, the TRADOC Deputy Commander. General Starry eventually assigned the Fixed Brigade as a full-time sub-task of the Division 86 target servicing task force at Fort Leavenworth. The Combined Arms Center studied four division structures where

⁹³ Information for this entire discussion of the Fixed Brigade Study comes from Romjue, Vol I, pp. 65-69, 90-93, and 128.

the division base organizations and functions were transferred to brigade; 1) total decentralization (self-sufficient brigade) 2) decentralization of combat support 3) decentralization of direct support 4) and decentralization of combat service support. CAC issued its initial study plan on 28 March 1979, and published the Fixed Brigade Study three and one-half months later.

The proposed brigade with its requisite division base had two unique features. First, it was composed of combined arms battalions. Second, its direct support elements were organic to the brigade as were the maneuver elements. With the support battalion as well as MP, artillery, NBC, engineer, air defense, signal, plus military intelligence units assigned to the brigade, there was an habitual association of combat and support units. The brigade was the building block of combat power. The habitual associations gave the design the advantage of "train as you will fight; fight as you have trained." The brigade also managed its own resources as had the regiments of the pre-ROAD era. Yet it was plagued by disadvantages, mainly the brigade commander's span of control problems. Training management problems increased, which contributed to the severe disruption it caused to the Army Reserve Components under the Total Army concept. The brigade, with its combined arms battalions and organic support arrangement, would limit the division's tactical flexibility and ability to influence support. Finally, it would be very expensive, requiring an increase in Army strength by the

equivalent of as much as a full division because of the decentralization of otherwise pooled resources.

On 18 October 1979, at the same time he was approving the Objective Heavy Division, General Meyer formally ended the Fixed Brigade Study. Both he and General Starry agreed that the Army was not yet ready for such a concept.

INFANTRY DIVISION 86 (1979 - 1981)

Division 86 was the first of four major organizational studies by TRADOC to design and develop an objective Army force for implementation by 1986. Besides Division 86, the studies -- cumulatively referred to as the Army 86 Studies -- included Infantry Division 86, Corps 86, and Echelons Above Corps 86.

Infantry Division 86 attempted to redesign the light infantry division. As late as 1979, the Department of Defense intended to mechanize existing light infantry divisions. General Meyer argued against such a move, saying that rather than "heavy-up" light divisions through mechanization, the Army could increase their effectiveness and retain strategic mobility through technology. World events strengthened his case when the Iranian hostage crisis and the Soviet invasion of Afghanistan highlighted to policy makers the need for flexible, rapidly

deployable infantry units suitable for contingency situations.⁹⁴

General Starry announced the light division study during the August 1979, Division 86 workshop. He noted that the 9th Infantry Division might serve as the organizational model. In a 28 September meeting, he and General Meyer developed a dual mission for the light divisions. These divisions had to be able to conduct worldwide contingency operations to destroy enemy forces and control land areas as well as deploy rapidly to reinforce forward NATO forces. The Army relied heavily on advanced technology to enable these smaller divisions to accomplish their diverse and demanding missions. In October Meyer approved the project whose purpose was "to round out the Army capabilities for 1986, by reorganizing and upgrading the infantry division to capitalize on innovative operational concepts and new technology, in order to meet the demands upon the Army to respond to contingencies in any part of the world." Design goals aimed to incorporate new systems, increase strategic deployability, increase tactical mobility, increase anti-armor capability, but decrease manpower.⁹⁵

⁹⁴ Ibid., p. 25.

⁹⁵ Romjue, Vol. II, pp. 25-27; US Combined Arms Combat Development Activity, Infantry Division 86 Feeder Report, (ACN 52955) (Fort Leavenworth, KS: USCACDA, April 1982), pp. 1-1/4/5. These two sources provide the most detailed description available of ID 86 actions through 1980.

Driven by a 14,000 man strength ceiling and with equipment limited to items that would fit into a C-141 aircraft, planners presented General Starry an initial version of the light division in January 1980. He rejected the design. It was not capable of rapid deployment, seizure of a lodgement and operations in a 150 mile radius while awaiting the arrival of heavier forces. Furthermore it exceeded the 14,000 man ceiling by 4,000 personnel.

In April General Meyer rejected a subsequent design because its force was too big yet lacked the combat power to be effective in central Europe. In brief, the design division could not delay heavy forces in open terrain. On 1 August General Meyer rejected a third attempt for a myriad of reasons. Ten days later he visited TRADOC headquarters and suggested that the light infantry division design have nine or ten battalions, two of which would be equipped with a protected anti-armor-assault system capable of defeating the T-72 tank and the remainder be mobile infantry. Infantry foxhole strength should be at least 2,200 men with three rifle companies per battalion.

A fourth version finally gained the Army Chief of Staff's approval. In September 1980, TRADOC recommended a 17,773-man structure with eight motorized infantry battalions and two mobile protected gun battalions as the objective Infantry Division 86 design (see pp. C-19/20). Meyer approved the recommendation for

planning and testing, but did not authorize programming. Over the next two years planners made minor adjustments in unit strength authorizations, but did nothing more with the design. General Meyer's interest in improving combat power through technology fixed attention on light infantry efforts in the 9th Infantry Division at Ft. Lewis, Washington. Infantry Division 86 lay dormant until the Army of Excellence initiative finally laid it to rest in 1983.⁹⁶

Infantry Division 86 was a product of changing Army intentions and circumstances and consequently became a transitional effort between the old ROAD infantry division and the future Army Of Excellence (AOE) light division. National policy was shifting its emphasis, tilting to the doctrinal implications of combat in the non-NATO world. Meyer noted that "the most demanding challenge confronting the U.S. military in the decade of the 80's is to develop and demonstrate the capability to successfully meet threats to vital U.S. interests outside of Europe, without compromising the decisive theater in Central Europe."⁹⁷ Infantry Division 86 planners attempted to meet the needs of rapid worldwide deployment to contingency operations and retain the capability to reinforce forward

⁹⁶ Romjue, Vol II, pp. 25-55; Wilson, Divisions and Separate Brigades, p. 444; Infantry Division 86 Feeder Report, p. 14.

⁹⁷ John L. Romjue, From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982 (Fort Monroe, Va: United States Army Training and Doctrine Command, June 1984), p. 39.

deployed forces in NATO. The design effort failed because the Army could not decide which was more important -- worldwide deployment or the ability to fight the Warsaw Pact -- and it was unable to produce a unit that could adequately do both.

HIGH TECHNOLOGY LIGHT DIVISION (HTLD) (1980-1984)

The High Technology Light Division emerged as an off-shoot of the Infantry Division 86 study primarily through General Meyer's efforts. While stationed in Europe during the mid-1970's, he became convinced that light infantry was essential for combat in the forested and urban areas there. He also believed that the American public would probably not support an extended, all-out war beyond the boundaries of central Europe. Therefore the Army needed powerful, highly mobile units that could rapidly deploy to areas in the rest of the world, quickly gain a victory and then re-deploy to the United States. Heavy forces might not be able to reach the region of conflict in time to be decisive. In his view, the Army needed a more conventional light infantry to balance its force structure.

Shortly after becoming Chief of Staff, General Meyer met with the Secretary of Defense, Dr. Harold Brown, and his staff to defend the 1980 Army Program and to convince them not to mechanize the 9th Infantry Division. Sensing they rejected his arguments, Meyer proposed that he could give the 9th ID many of

the characteristics of a heavy division through the innovative development and use of modern technology yet still retain its strategic deployability. The Secretary agreed to this proposal. The Iranian revolution and hostage crisis in November 1979 as well as the Soviet invasion of Afghanistan reinforced General Meyer's concerns by highlighting the potential need for quick reaction forces to meet a mid-intensity threat -- a capability the U.S. lacked in 1979.⁹⁸

On 15 May 1980, while the Infantry Division 86 planners worked on their third revised design of a light infantry division, the Army announced that the Army Science Board would study the high technology division. The Board's charter was to "determine if the effectiveness of the 9ID can be increased over the next three year period."⁹⁹ Its study was intended to find ways to increase the killing power, enhance electronics, increase survivability, and improve strategic and tactical mobility in the 9th Infantry Division. This summer long study promoted the idea of the 9th Infantry Division "high technology test bed" -- initially a means for the Army to test operational and organizational concepts of Infantry Division 86, but eventually

⁹⁸ Joseph Huddleston, Volume I. The High Technology Test Bed and the High Technology Light Division. Inception Through 30 September 1983. Draft manuscript (Fort Lewis Washington, 1984), prologue. This information came from an interview of General Meyer by Mr. Huddleston on 13 May 1984. Copy will be filed with CMH.

⁹⁹ Quoted in Ibid.

becoming a separate project developing the first motorized infantry division since World War II.¹⁰⁰

The Department of the Army established the High Technology Test Bed (HTTB) in June 1980. As late as July 1981, TRADOC and CAC viewed the 9th Infantry Division as a test of Infantry Division 86, but already the Army Chief of Staff and the DA staff were designing what they hoped would be an improved light division with a radically new configuration. In March 1981, the Army Chief of Staff made clear that the Test Director, General Howard S. Stone, had no obligation to test any part of Infantry Division 86 that did not make sense, and agreed that Stone was incrementally converting the 9th Infantry Division into a new force. Meyer also instructed the HTTB to examine new designs and concepts, not just test equipment. He wanted the organization to break from the traditional method of developing a specific item of equipment and testing it in a very structured method which, he felt, resulted in technology driving employment concepts. Instead, he wanted them to develop the High Technology Light Division (HTLD) by developing operational and organizational concepts, then validating them by using equipment already in the Army system or by following an abbreviated development cycle, taking advantage of available technology.¹⁰¹

¹⁰⁰ Ibid.; Romjue, Vol II, p. 41.

¹⁰¹ Huddleston, Volume I. The High Technology Test Bed, pp. 6, 19, 20-25, Chapter 13.

The influence of General Myer, a single strong personality, on developing the High Technology Light Division study had similarities to the creation of the Pentomic Army and MOMAR I. Yet the High Technology Light Division became unique among all previous army design efforts. For the first time the division controlled the study and the responsibility for designing and testing equipment as well as developing operational and organizational ideas. The study was probably the closest that the Army has come to basing a design on the tactical and operational doctrine the unit would use in battle.

The effort concentrated on designing a division to fight primarily in the Middle East and secondarily as part of NATO. On 30 July 1981, General Meyer determined that Infantry Division 86 could not accomplish his goals for the HTLD and accordingly set Fiscal Year 85 as a deadline for the 9th Infantry Division efforts to field the new division. He later changed this target date to Fiscal Year 86, to field an HTLD of 16,000 soldiers transportable in 1250 sorties, reduced to 1,000 sorties by 1990.

Numerous difficulties arose, especially in funding for equipment, but by May 1983, the basic division design neared completion and was ready for evaluation and fielding. Personalities, however, entered the equation and changed the thrust of the test. The High Technology Light Division had been the pet project of General Meyer, but the new Army Chief of

Staff, General John A Wickham Jr., had his own agenda. That same year, 1983, General Wickham initiated the Army of Excellence (AOE) study (which will be discussed below) -- an effort to produce another type of light division -- which changed the course of the High Technology Light Division. The 9th Infantry Division now concentrated on developing a motorized division of about 13,000 men. The High Technology Light Division lost its high priority and resources, but planners adjusted to the environment and in December 1984 General Wickham approved a 9th Infantry Division (Motorized) Objective Division design (see p. C-21).

During the next 4 years the 9th Infantry Division continued to adjust and test the motorized concept. By 1988, with minor adjustments, this had evolved into a unit designed to fill the gap between the AOE heavy and light divisions. It was "fully capable of being airlifted anywhere in the world" and ready "to fight enemy armored forces upon arrival with great mobility and agility" (see pp. C-22/23).¹⁰² The motorized division had three ground maneuver brigades, cumulatively comprising nine maneuver battalions: five combined arms battalions (heavy) [CAB(H)], two combined arms battalions (light) [CAB(L)], and two light attack battalions [LAB]. The cavalry brigade (air attack) [CB(AA)] was designed and employed as a fourth maneuver brigade with one

¹⁰² Lt. Col. Stephen L. Bowman, "The 'Old Reliables'. One of a Kind," Army Vol 38, No. 2 (Feb. 1988): 28.

attack helicopter battalion, an air cavalry squadron and a combat support aviation battalion. Division artillery consisted of three direct support battalions of 155-mm howitzers and a general support battalion of MLRS and 105-mm howitzers.¹⁰³

The combined arms battalion (heavy) had two antiarmor companies and one motorized infantry company. The CAB (light) had the inverse ratio of the CAB(H). Both had common HHC's and combat support companies. The light attack battalion had similar HHC and CSC structures as the CAB's, but instead of antiarmor companies, it had three companies armed with HMMWV Wheeled vehicles carrying the TOW II or the Mark 19 40-mm grenade machinegun.¹⁰⁴

The motorized division concept was also in trouble by 1988. Defense budget reductions forced the inactivation of the 2nd Brigade which was replaced by a heavy (two tank battalion/two mechanized infantry battalion) National Guard Round-out unit. An armored battalion was transferred to the division from I Corps, and during that same year the Army stopped development for an armored gun system. By December 1988, the Department of the Army decided that the 9th ID would consist of one active heavy

¹⁰³ FM 101-10-1/1. Staff Officers' Field Manual. Organizational, Technical, and Logistical Data. (Vol 1) (Washington, DC: Department of the Army, 7 October 1987), Chapter 6.

¹⁰⁴ Ibid.

brigade, one active motorized brigade, and one reserve component heavy brigade.

ARMY OF EXCELLENCE (AOE) (1983 - 1984)

Since World War II the Army has made its divisions bigger, heavier, and more mechanized. In 1950 the ratio of light divisions (infantry, airborne or air assault) to heavy divisions (armor or mechanized infantry) was 9 to 1. By 1983 the ratio stood at 1 to 1.5. Resources decreased while America's global responsibilities and the potential threat increased. Throughout the 1970's, Army leaders tried to increase combat power without a requisite increase in manpower and costs. They converted headquarters and support spaces to combat spaces, shifted support structure slots from the active force to the reserve force, and used round-out units (National Guard brigades affiliated for training and mobilization with reduced strength active duty divisions). Finally, they capped end strength -- recognizing that the size of the Army would not increase -- and turned to new technology for the most efficient, least manpower intensive equipment.¹⁰⁵

¹⁰⁵ MG Wilson A. Shoffner, ADCSOP (Force Development), statement before the Subcommittee on Defense of the Senate Appropriations Committee, Second Session, 100th Congress, 29 March 1988.

Division 86 units continued the "heavying up" trend of the previous 30 years. So much so, in fact, that in February 1982, the Department of the Army directed a review of the design. A Ft. Leavenworth task force (Task Force 86) recommended a 9-battalion structure for the heavy division, which the Army Chief of Staff approved on 25 March 1982. A quick look at the advantages and disadvantages of this decision demonstrates that by 1982 active duty end strength was an overwhelming consideration in force design decisions. The task force (and the Chief of Staff) decided that the disadvantages of reducing the division commander's firepower by 10% -- eliminating part of his ability to attack deep, maintain a reserve and to fight the rear battle -- and of reducing his flexibility to task organize, were positively outweighed by the advantage of reducing Army end strength.

By the summer of 1983, several problems caused the Army to be concerned about its force structure. Global commitments meant the possibility of a mid- to high-intensity threat from the Soviet Union as well as the increasing probability that contingency operations would involve low intensity conflict or terrorism. Yet the ability to project military power was simultaneously limited by scarce strategic air and sea lift resources and by unit Tables of Organization and Equipment that had high deployment profiles, meaning they needed many air and sea sorties to completely deploy all soldiers and equipment.

Even the 82nd Airborne Division required more than 1,000 C-141 missions to deploy.¹⁰⁶ It simply took too long to get the available forces to the battlefield.

Of greater concern in 1983 was the inability to man the force. The Army was "hollow". One indication was the number of units with multiple missions. Conceivably, many of the multiple missions could occur simultaneously in different theaters so forces might lack the units necessary to carry out their assignment. Another indicator of hollowness was the number of units in the force manned at a reduced Authorized Level of Organization (ALO), and the number of units that only existed on paper with no manning authorized. Available resources could not meet the personnel and equipment requirements established by the force design.

The Division 86 design was unwieldy on the battlefield as well as unaffordable. The Army's leadership perceived the structure as too large and cumbersome to act as the primary maneuver element in the corps. The force design also had doctrinal problems. AirLand Battle required the corps commander to orchestrate the operational level of the battle and influence the outcome with his resources. Yet without sufficient combat and combat support elements he was unable to do this. The

¹⁰⁶ Trip Report by Major Wintrich, AFOP-FM, HQ USACAC, Fort Leavenworth, KS, 12 Sep 83, sub: 10K Light Division/Decrements to Heavy Division 86. Copy in author's possession. Will be filed with CMH.

Division 86 design had combat support assets at division level in excess of those at corps.¹⁰⁷

After the Commanders' Conference in August 1983, General John A Wickham, Jr., the new Army Chief of Staff, directed the TRADOC Commander to conduct a feasibility study for restructuring the Army. This was the official beginning of the Army of Excellence study, but work had actually begun in earnest the previous month. On 15 July 1983, MG Morelli, Deputy Chief of Staff for Doctrine, TRADOC, sent a message to the Combined Arms Center Commander (Ft. Leavenworth), LTG Carl A. Vuono, giving him a "heads up on the development of the new (Light) infantry division concept and force design directed by the CSA".¹⁰⁸

General Wickham's enthusiasm for light forces and his perception that the Army needed lighter infantry divisions in its current structure led to a rushed light division design effort. Contrary to the methodology of the Concept Based Requirements System, the hurried endeavor developed the operational concept simultaneous with the force design. Instead of designing a unit to meet an identified need, the Army developed the need concurrent with the design. Planners were meticulous, however, in ensuring that

¹⁰⁷ FC 100-1, p. 1-3.; The Army of Excellence Final Report. Volume III. The Heavy Division (Fort Leavenworth, KS: USACACDA 1 October 1984), p. 1-1. Hereafter referred to as AOE Vol III.

¹⁰⁸ Msg, MG Morelli, DCSDOC, HQ TRADOC to LTG Vuono, Cdr, USACAC, 151540Z Jul 83, sub: New Light Infantry Division.

operational concepts preceded the force design, even if only by a matter of days.¹⁰⁹

General Wickham directed TRADOC to look at ways to reduce the "hollowness" of the Army, and to provide recommendations to him by October 1983. The resulting study focused on designing a light division, reducing the end strength of the heavy divisions, and redesigning the corps and echelons above corps (EAC) structures. The first step was to design the Light Infantry Division (LID), which the planners constructed as an entirely new unit rather than refining earlier design efforts (see p. C-24). Next they reduced the heavy force designs by cutting personnel more than fifteen percent along with significant amounts of materiel (see pp. C-26/27). Finally, they developed the AOE corps and EAC designs for each theater.¹¹⁰

General Wickham directed that the LID's 10,000 soldiers be organized into nine maneuver battalions, be deployable in 400-500 aircraft sorties, have half the division as infantrymen, and be affordable within mandated resource restraints. The Combined

¹⁰⁹ Msg, Gen Richardson, Cdr, TRADOC to LTG Vuono, Cdr, USACAC, 181135Z Aug 83, sub: Light Infantry Division; FC 100-1, The Army of Excellence (Fort Leavenworth, KS: USACACDA, 1 September 1984), pp. 1-4. Hereafter referred to as FC 100-1; The Army of Excellence Final Report. Vol. II. The Light Infantry Division (Fort Leavenworth, KS: USACACDA, 1 October 1984), pp. 1-3. Hereafter referred to as AOE Vol II. Phone interview with Mr. John Romjue, TRADOC historian, 16 May 1991.

¹¹⁰ FC 100-1., pp. 1-3 to 1-5.

Arms Combat Developments Activity sponsored a series of workshops over the next seven weeks where representatives from TRADOC schools and centers, FORSCOM, and other major commands participated in the design process. General Wickham approved an initial LID design on 20 October 1983, and a revised design on 10 November.¹¹¹

The 10,220 man division approved in November was a sparse, foot-mobile organization designed from the ground up to meet the requirements of the low intensity battlefield. It required augmentation by the corps to operate in any greater threat environment. It had three brigade headquarters, nine infantry battalions, division artillery with three battalions of 105 mm. towed howitzers, a combat aviation brigade with a reconnaissance squadron, attack helicopter battalion, and two combat aviation companies, a division support command, an MP company, an engineer battalion, an air defense battalion, a signal battalion, and a band.

To make it a spartan structure, TRADOC eliminated the AG company, consolidated mess and maintenance operations at brigade level, and eliminated all organic vehicles in the line companies. Also reduced were the military police and engineer missions in order to decrease the size and vehicle densities in those units. Lessened indirect fire support requirements at division and

¹¹¹ AOE Vol. III., pp. 1 and 1-1.

company level allowed elimination of GS artillery, reverting to 105mm howitzers, and dropping the company mortars. Whenever possible, designers replaced TOE organic capability, like the chemical company, with "plugs" of a few trained cadre to accept future corps augmentation as necessary.¹¹²

The TRADOC designers focused on three considerations to develop the division. First, they designed it specifically for low-intensity combat with a combat service support system "to permit the division to operate in a low intensity setting for 48 hours without external support". As structured, the light infantry battalion could defeat "light enemy forces in a low intensity setting". The elimination of general support artillery, the lack of anti-armor capability, the lack of an NBC company at division, and the air defense arrangements all hinged on use in a low-intensity arena.¹¹³ In other words, they designed the light division for a specific, limited role.

The ability to deploy was another consideration in the final product. "The decision to use 105mm instead of 155mm howitzers for the DS battalions was made primarily because of the large deployability penalty of the 155mm."¹¹⁴ Likewise, the determination to use HMMWV 5/4 ton trucks instead of 5-ton trucks

¹¹² AOE Vol II, p. 1-5.

¹¹³ Ibid., pp. 3-5, 5-7, 6-4, 6-5, and 8-1.

¹¹⁴ Ibid., p. 5-4.

in the support platoon, to remove the mortars from company level, and to omit general support artillery, was done to improve the unit's ability to deploy rapidly. Even the battalion "was designed to have the smallest possible deployability profile".¹¹⁵

The overriding design intent was to reduce manpower requirements. The active component end strength was set at about 780,000 men, and would not rise. Any force design changes had to occur within that constraint on personnel. Reducing the infantry squad to 9 men and the artillery gun section to 7 men, and dual-hatting positions to provide semi-trained "revenge" (only fire when attacked) air defense missile operators, were the most visible manifestations of the efforts to trim men from the division. The design objectives from CACDA inordinately pointed in that direction. Of the fourteen objectives, eight were directly related to cutting strength. The most euphemistic of these was the requirement to "increase the leader to led ratio"--which was always accomplished by reducing the number of led, never by increasing the number of leaders.

The unspoken variable behind the manpower issue was the Army budget shortfalls, which played an extremely important role in the entire light infantry division process. The Navy and the Air Force placed great demands on the Department of Defense budget

¹¹⁵ Ibid., p.3-3.

with their sophisticated and expensive hardware, leaving the Army a relatively small portion of the budget pie. The Army was a very labor intensive service that used much of its resources just to pay its personnel. The light division would immediately broaden the Army's mission capability and allow it to argue for contingency operations funding that otherwise might go to the Marine Corps by default.¹¹⁶

In a September 1983 message, LTG Vuono noted that General Wickham had "emphasized that the most important fact of this whole restructuring effort is to make sure that we have a concept that will capture support and resources from OSD".¹¹⁷ Secretary of the Army, John O. Marsh Jr., believed that the Army's inability to deploy rapidly hurt the Army's appeals for force structure and modernization funds. As he put it, "Why modernize if you can't move it?" In 1983 the Army's deployment requirements demanded a greater share of budgetary resources, and this increased its competition with the Navy and Air Force. Mr Marsh wrote, "I have come to the view that realistic near-term deployment requirements are destined to be bow waved into a long-term pot at the end of the rainbow." He agreed with General

¹¹⁶ Memorandum from Secretary of the Army John O. Marsh, Jr. to Army Chief of Staff General John A. Wickham, Jr., no subject, dated 8 September 1983. Copy at the US Army Combined Arms Center force structure office; Sam Damon and Ben Krisler, "'Army of Excellence' A Time to Take Stock," Armed Forces Journal International Vol. 22, No. 10 (May 1985): 86-94.

¹¹⁷ Msg, LTG Vuono to General Richardson, 141600Z Sep 83, sub: CSA Visit to CAC.

Wickham that the light division could serve as a vehicle to gain more resources. "In short, I agree with you. Let's put together a division that can get there. It can be a stepping stone to achieving what we ultimately need."¹¹⁸

The two other elements of the Army of Excellence study were overshadowed by the publicity surrounding the light division. The AOE review of Division 86 left the heavy division designs intact, but removed from it some of the functions and the built-in redundancy and planned resilience. The modifications moved unique systems such as the Chaparral air defense missile and the 8-inch howitzer to corps and reduced heavy division strength by over 3,000 slots. At the same time, it returned the 10th battalion that Task Force 86 had removed the previous year. The Corps/EAC effort modified the corps' troop units to improve the combat potential of the corps. It furthermore improved the corps commander's air defense organization, added to his engineer strength, increased his chemical structure, expanded his artillery firepower, strengthened his aviation brigades, added a rear area combat operations brigade and long range surveillance company, and generally increased his combat capability to execute the Corps Campaign Plan.¹¹⁹

¹¹⁸ Memorandum from Secretary of the Army John O. Marsh, Jr. to Army Chief of Staff General John A. Wickham, Jr., no subject, dated 8 September 1983.

¹¹⁹ FC 100-1, pp. 3-1 to 4-5.

Army of Excellence proponents claim that AOE provides divisions that focus on combat capability and furnishes streamlined light forces that demonstrate flexibility with their ability to rapidly deploy anywhere in the world. But the restructuring effort has its critics. Writing under pseudonyms in the May 1985 Armed Forces Journal International, two disgruntled officers launched a scathing attack of the entire Army of Excellence study. Accusing Army leaders of developing the light divisions for combat in the politics of inter-service rivalry, the authors denounced the the designers for circumventing the Concept Based Requirements System, for not field testing the design, and for fielding the light division when the Army already had special operations forces to execute the same mission. The critics were especially brutal in attacking the manpower cuts and the negative impact of AOE on weapons development. They viewed AOE as an irrational step that diminished the combat capability of the Army. In their view it was "a search for operational justification for a political solution."¹²⁰

Two points are clear. First, resource constraints, both fiscal and personnel, drove the Army of Excellence study. Although planners earnestly felt the requirement existed for lighter, deployable forces to meet the new strategic situation

¹²⁰ Sam Damon and Ben Krisler, "'Army of Excellence'. A Time to Take Stock," Armed Forces Journal International Vol 22, No. 10 (May 1985): 86-94.

presented by the Reagan administration, limited resources overwhelmingly influenced the actions taken. Second, as with so many previous studies, the ideas, experiences, beliefs, and vision of one man were critical. In this case, General Wickham was the personality that de-emphasized the High Technology Light Division, initiated a major force design study within a month of assuming his duties, had the approved design in 4 months, and activated his first unit under the design a year later.

CONCLUSIONS

Since 1939 the Army has come become increasingly sophisticated in its approach to force structure and force design. The process is more organized, detailed, and refined than before, but experience still offers useful lessons and illuminates trends that will be as applicable tomorrow as yesterday.

Assuring mobility and flexibility have been the dominant objectives of division force design planners, followed closely by pursuit of an organization to incorporate new weapons, and improve the effective use of combat power. Certain features seem central to the ultimate design that is approved and implemented. The most important variables upon which planners base their designs are the available mobility, communications capabilities, and firepower. Or so they say -- and there is some truth to

their claim. The switch to the triangular division was possible because increased motorization, reasonably reliable radios, and increased firepower through technology (M1 Garand rifle, aircraft, tanks, better artillery) compensated for the loss of mass. Greatly improved communications facilitated the ROAD design. Division 86 designed organizations to maximize the use of new equipment coming on line, primarily for mobility and firepower.

In reality, the pre-eminent influences on division design and force structure are manpower and money. General McNair made adjustments during World War II because of a small manpower pool as well as his doctrinal convictions. Between World War II and the Korean War, reduced budgets and limited personnel mandated the army's size and organization. Both the Pentomic design and the Army of Excellence were efforts to maximize the utility of a limited end-strength and secure a larger slice of the DOD budget.

Success of the design effort depends upon involving agencies Army-wide in a well coordinated, widely staffed effort. Without that coordination, early attempts to implement the triangular division went nowhere. The Army Field Forces studies which preceeded the PENTANA study were not staffed with the administrative and technical services nor with the service schools. PENTANA inherited this inadequate preparation and consequently never amounted to more than a "transitional" design

that was never implemented. The Division Restructuring Study was narrowly based, tightly controlled by General DePuy, and never implemented. Army 86 and the Army of Excellence studies, on the other hand, involved many agencies from both TRADOC and FORSCOM, and the results of both were much more positive.

The Army has successfully used divisional design models to justify funding requests for research, development, and production of new weapons and equipment. The PENTOMIC division permitted demands for more manpower to help support and supply the widely dispersed units. It justified R&D dollars for improved weapons, vehicles and communications to support the tactical concepts required by the new division. Likewise, ROAD and Division 86 provided the rationale for more defense dollars, while the Army of Excellence helped the Army make an argument to keep its share of the budget.

Throughout the period, certain dilemmas have consistently confronted planners. Placement of new weapons has been an habitual problem. Which echelon is best for air defense and anti-tank systems? How should we assign aircraft? Aviation was initially assigned to subordinate elements like field artillery and signal units. Later it was consolidated at division level. Where should we place nuclear weapons? At one time the Army had nuclear capability at all echelons, battalions being equipped with the Davy Crockett. Some new systems over the years have

gone from centralized control to decentralized employment, like the machinegun, but recent trends point to centralization of weapons. The TOW missile was formed into TOW missile companies, the Redeye anti-aircraft missiles were moved from battalions to an ADA organization, the mortars were removed from the mechanized infantry line companies, and the armored vehicle launched bridges (AVLB's) were moved from line battalions to engineer units. Sometimes the move was to provide better control or training. Sometimes it was to better utilize resources.

The philosophical debate over placement of resources in general has been a similar dilemma. Is it better to centralize at the corps level and pool assets, or to provide for an habitual relationship at the "user level" except for the most infrequently used or critical of resources? During World War II, General Lesley McNair was determined in his efforts to pool as many resources as possible at the corps level to keep the divisions lean, agile, and offensively minded. Nonetheless, by the end of the war many of the "pooled" weapons and other resources were attached to the divisional units. After the war the Army undid McNairs work and strengthened the divisions again with various attachments. With the Pentomic division the Army again tried to clean out the divisions and pool resources. Division 86 undid that effort while AOE again pooled resources. Pooling did not work very well because it was not managed efficiently. In other words, there has been an historic inability to shift the pooled

resources in a timely manner to where they are most needed. The economy of scales envisioned by planners generally do not show up in execution. Even so, when resources are limited as in 1942, 1957, and 1984, the army reverts to pooling as an economy measure.

Another planners' quandary is strategic mobility. In the last 35 years designers have been unable to resolve the dilemma of combat capability versus transportability. In fact, General McNair struggled to find acceptable trade-offs as he reduced divisions to fit more of them into the limited ship transport during World War II. The High Technology Light Division was an unsuccessful effort to find a technological solution to the alternative of either divisions that are too heavy (as Division 86) or divisions that lack staying power (as the PENTOMIC divisions). The light infantry division was another effort to solve the problem, but still did not provide a quickly deployable division that can survive in a mid- to high-intensity environment. Resolution of this question is directly related to the resource problem discussed earlier. Without more money and more research, force designers must make prudent judgement about which is more critical: heavy or deployable.

Reducing the Army's logistics tail has been a thread of continuity in design efforts. Planners continually tried to increase combat power while reducing the support tail. The

PENTANA study and the Division 86 study attempted this, although their focus was otherwise completely different. So too did the Army of Excellence by adding the concept of keeping manpower needs steady.

A noticeable pattern over the last 50 years has been shift of the echelon where one finds tactical and administrative integration. It has steadily moved to lower levels, driven by the necessity to enhance self-sufficiency due to the dispersion of units on the modern battlefield and supported by advances in transportation and improvements in communications. During World War II, the regimental combat teams were the level of tactical and administrative self sufficiency. Battalions in armor divisions were self contained, but were a small part of the total force and did not represent the primary force design doctrine. In the PENTOMIC divisions the level was lowered to the battle group, and with ROAD, the self-contained unit level became the battalion, where it has remained for over 30 years. Given the state of technology, and the economies of scale involved, this is likely to be the case into the foreseeable future.

Fifty years of experience have provided some clear lessons. Specialized divisions (like mountain, jungle, or motorized divisions) and universal divisions (like the PENTANA division which was meant to ultimately fill all Army needs with a single type organization) do not work. The Army formed and trained

special divisions during World War II. Without exception, the units were not worth the time, effort, manpower, and resources involved. The Army ultimately rejected light, mountain, motorized, and jungle units because it was more cost effective to use standard infantry units. More recently, the High Technology Light Division failed as a specialty unit for the same reason. At the other end of the spectrum, the PENTANA study, and MOMAR I, both intended to design units to meet virtually all the army's needs with one package, were never implemented. Historically, the Army has needed a mixture of standard units, designed for flexible, but general use, such as armored, mechanized, infantry, airborne, and air assault.

Divisions designed while depending on "to be developed" weapons and technology do not fare well. Units designed to take advantage of technology which is coming on line, like the ROAD study, or Division 86 -- where the weapons were designed, developed, and scheduled for fielding when the study went into effect -- fare better. Units designed to capitalize on anticipated future technology such as the PENTANA study and PENTOMIC divisions, are almost assured failure. The HTLD experience indicates that developing the technology to fit the design is also unsuccessful.

A corollary is that attempts to solve all organizational structure and design problems in one study fail because the subject is too broad. This contributed to the failure of both

the PENTANA study and MOMAR I which were overly ambitious in scope. Conversely, ROAD succeeded by focusing specifically on the division. Army 86 succeeded with four separate studies, two centered on the division alone, although the light part -- the Infantry Division 86 study -- never was successfully completed.

One final thought emerges from examining 50 years of force structure and force design initiatives of the United States Army. Strong personalities have played unexpectedly pivotal roles in the entire process. As large as the effort has become, and with the tremendous number of staff agencies and individuals involved, one might expect the force design process to proceed on its own bureaucratic inertia. Instead, one individual in a powerful position, with strong ideas, has left his indelible mark time after time. General Taylor made the PENTOMIC divisions. General Clarke's personality and experiences permeated the MOMAR I study. General Eddleman, based on his previous experiences with the West German army, gave us the ROAD division. General Starry was the dynamic force who not only directed the Army 86 studies in the direction he wanted, but gave the Army a new doctrine at the same time. The HTLD was General Meyer's, just as the AOE that supplanted it when Meyer left as Chief of Staff was the product of General Wickham who replaced him. It is not surprising that the support of someone in a powerful position is necessary to get a study going, for the Army bureaucracy is too large and diffused to accomplish such a task on its own. It is surprising, however,

that in so many cases the imprint of the single personality is so readily present. Perhaps the message here is that visionary, determined leadership is more important to a successful force design project than an exceptional bureaucracy.

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LTG George I Forsythe

LTG James M. Gavin

General Barksdale Hamlett

General Hamilton Howze

General Maxwell D. Taylor

General William C. Westmoreland

General Melvin Zais

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U.S. ARMY FORCE STRUCTURE
1939 - 1989

<u>YEAR</u>	<u>TOTAL DIVISIONS</u>	<u>INF</u>	<u>ARMOR</u>	<u>TYPE ABN</u>	<u>DIVISIONS AIR ASLT</u>	<u>MECH</u>	<u>OTHER</u>
1939	7	6	0	0	0	0	1 - CAV
1940	13	10	2	0	0	0	1 - CAV
41	36	29	5	0	0	0	2 - CAV
42	73	56	14	2	0	0	1 - CAV
43	90	68	16	5	0	0	1 - CAV
44	89	68	16	5	0	0	0
45	88	67	16	5	0	0	0
46	16	12	2	2	0	0	0
47	10	7	1	2	0	0	0
48	10	7	1	2	0	0	0
49	10	7	1	2	0	0	0
1950	10	7	1	2	0	0	0
51	18	14	2	2	0	0	0
52	20	16	2	2	0	0	0
53	20	16	2	2	0	0	0
54	19	14	3	2	0	0	0
55	20	14	4	2	0	0	0
56	19	12	4	3	0	0	0
57	18/15	11/9	4/3	3	0	0	0
58	15	9	3	3	0	0	0
59	15	10	3	2	0	0	0
1960	14	9	3	2	0	0	0
61	14	9	3	2	0	0	0
62	18	7	5	2	0	4	0
63	16	6	4	2	0	4	0
64	16	6	4	2	0	4	0
65	16	5	4	2	1	4	0
66	17	6	4	2	1	4	0
67	17	6	4	2	1	4	0
68	19	8	4	2	1	4	0
69	18	7	4	1	2	4	0
1970	16	5	4	1	2	4	0
71	13	3	3	1	2	4	0
72	13	3	3	1	1	4	1 - TRICAP
73	13	3	3	1	1	4	1 - TRICAP
74	13	3	4	1	1	4	0
75	14	4	4	1	1	4	0
76	16	5	4	1	1	5	0
77	16	5	4	1	1	5	0
78	16	5	4	1	1	5	0
79	16	4	4	1	1	6	0

U.S. ARMY FORCE STRUCTURE 1939 - 1989 (continued)

<u>YEAR</u>	<u>TOTAL DIVISIONS</u>	<u>INF</u>	<u>ARMOR</u>	<u>TYPE ABN</u>	<u>DIVISIONS AIR ASLT</u>	<u>MECH</u>	<u>OTHER</u>
1980	16	4	4	1	1	6	0
81	16	4	4	1	1	6	0
82	16	4	4	1	1	6	0
83	16	4	4	1	1	6	0
84	16	4	4	1	1	6	0
85	17	4	4	1	1	6	1 - 9IDMTZ
86	18	5	4	1	1	6	1 - MTZ
87	18	5	4	1	1	6	1 - MTZ
88	18	5	4	1	1	6	1 - MTZ
89	18	5	4	1	1	6	1 - MTZ

NOTES:

1939: 6 infantry divisions active, 3 only partially organized; 1st cavalry division active, 2nd cavalry partially organized but not activated.

1942: 2nd Cavalry Division inactivated.

1943: 2nd Cavalry Division activated. 1st Cavalry Division switched to infantry TO&E.

1944: 2nd Cavalry Division inactivated.

1969: 101st Airborne Division switched to airmobile (air assault) TO&E in late 1968.

1971: 4th Armored Division inactivated.

1972-73: 1st Cavalry Division organized to test TRICAP concept. Switched from air assault TO&E.

1974: 1st Cavalry Division switched to armor TO&E.

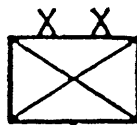
1985-86: Light Infantry Divisions (LID) organized. 7th ID converted in FY 1985; 10th LID activated in February 1985; 25th ID converted in FY 1986; 6th LID activated in March 1986.

APPENDIX B
FORCE DESIGN INITIATIVES 1939-1989

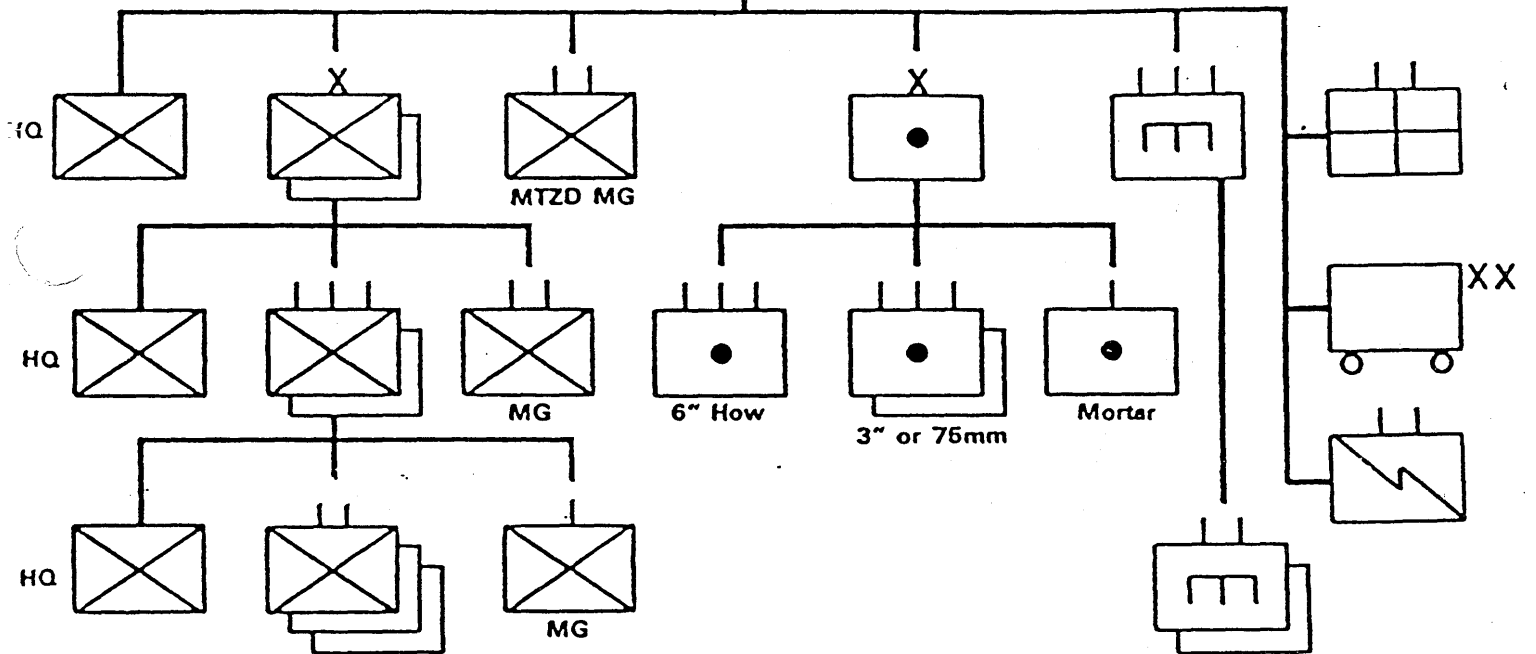
- A. TRIANGULAR DIVISION (1919-1939)
- B. PENTOMIC ARMY (1956)
 - * ATOMIC FIELD ARMIES (ATFA) (1954-1955)
 - * PENTANA STUDY (1955)
 - * PENTOMIC DIVISIONS
 - ROTAD (Reorganization of the Airborne Division)
 - ROCID (Reorganization of the Current Inf. Div.)
 - ROCAD (Reorganization of the Current Armored Div.)
- C. MODERN MOBILE ARMY 1965 (MOMAR I) (1959-1960)
- D. REORGANIZATION OBJECTIVE ARMY DIVISIONS (1961-1965) (ROAD-65) (1960-1961)
 - * AIR ASSAULT DIVISION (1962-1965)
 - * TRICAP (1971-1974)
- E. DIVISION RESTRUCTURING STUDY (1975-1979)
- F. ARMY 86 (1978-1983)
 - * DIVISION 86 (1978-1980)
 - * FIXED BRIGADE (1978-1979)
 - * INFANTRY DIVISION 86 (1979-1981)
 - * CORPS 86 (1979-1983)
 - * ECHELONS ABOVE CORPS (1979-1983)
- G. HIGH TECHNOLOGY LIGHT DIVISION (HTLD) (1980-1984)
- H. ARMY OF EXCELLENCE (1983-1984)

SQUARE DIVISION

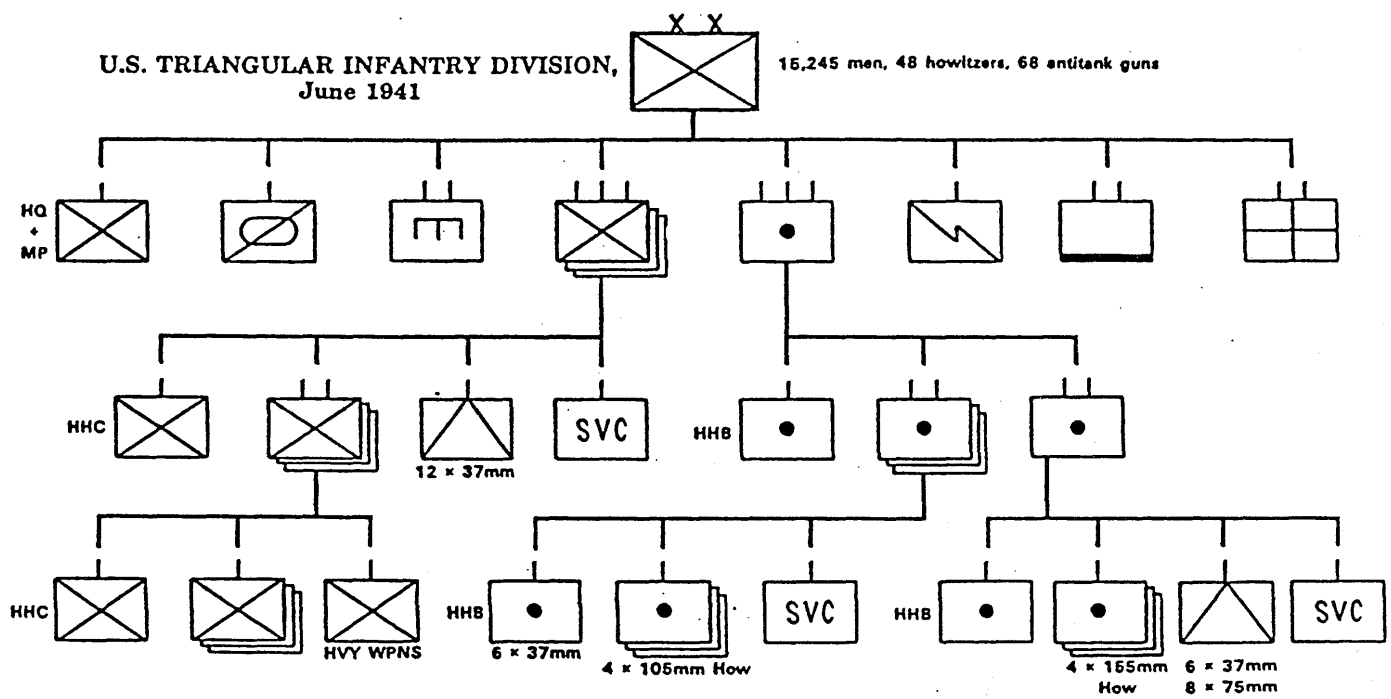
TYPE U.S. DIVISION, 1918



28,105 men, 77 guns,
260 machine guns

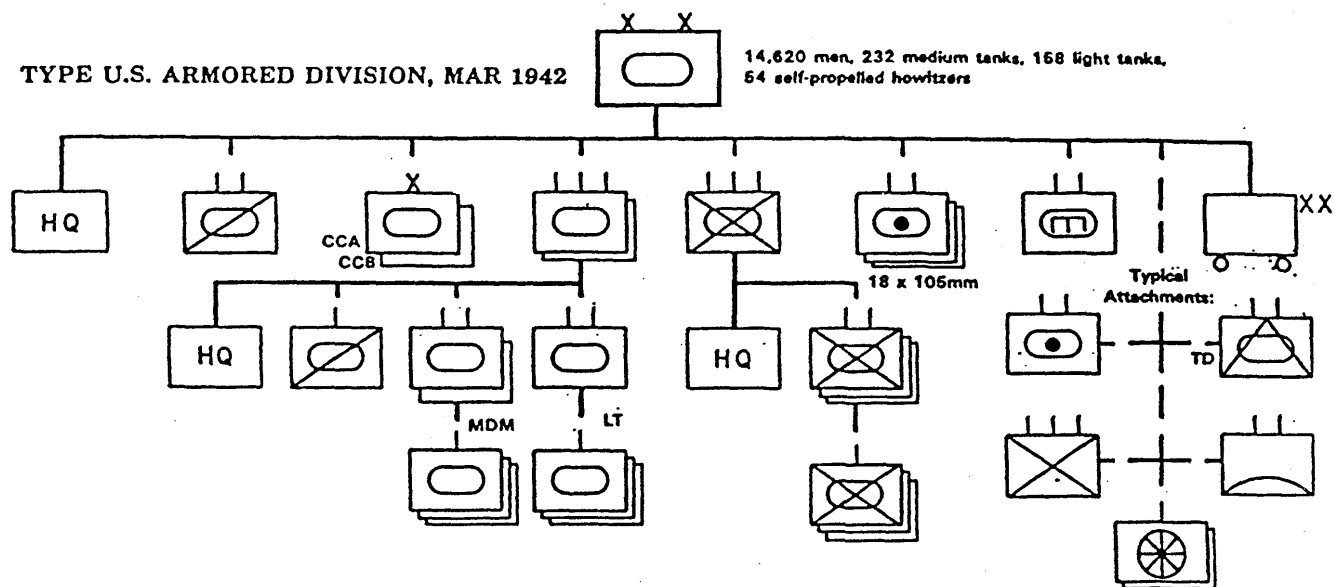


TRIANGULAR INFANTRY DIVISION

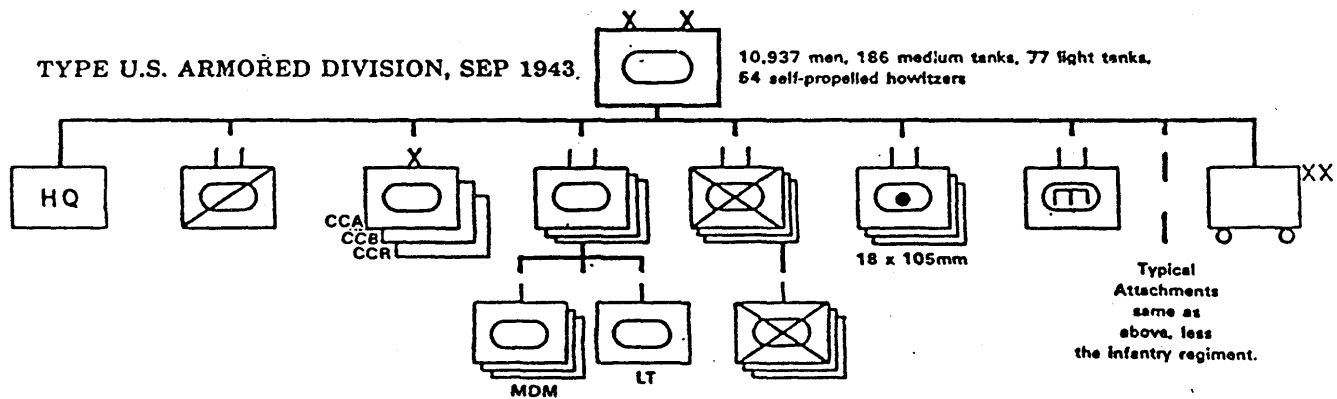


ARMORED DIVISION

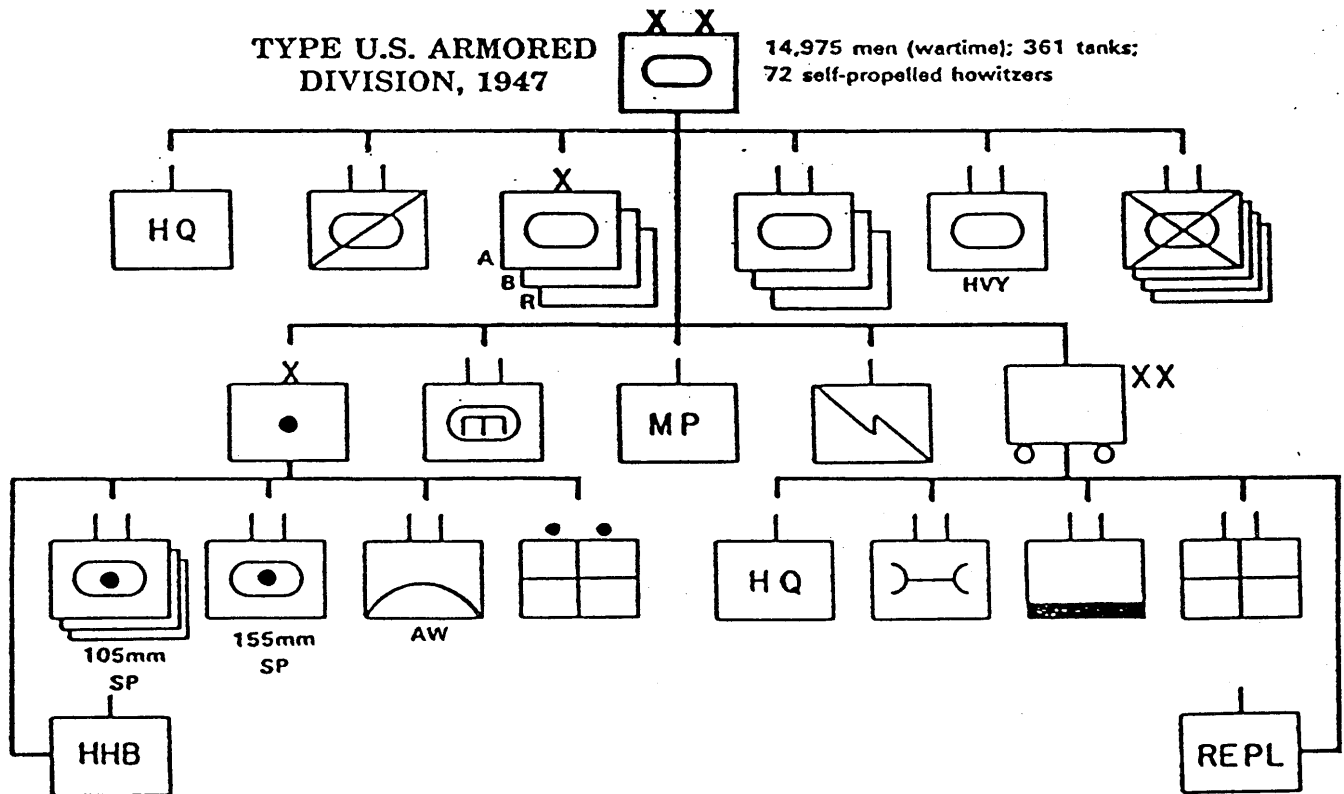
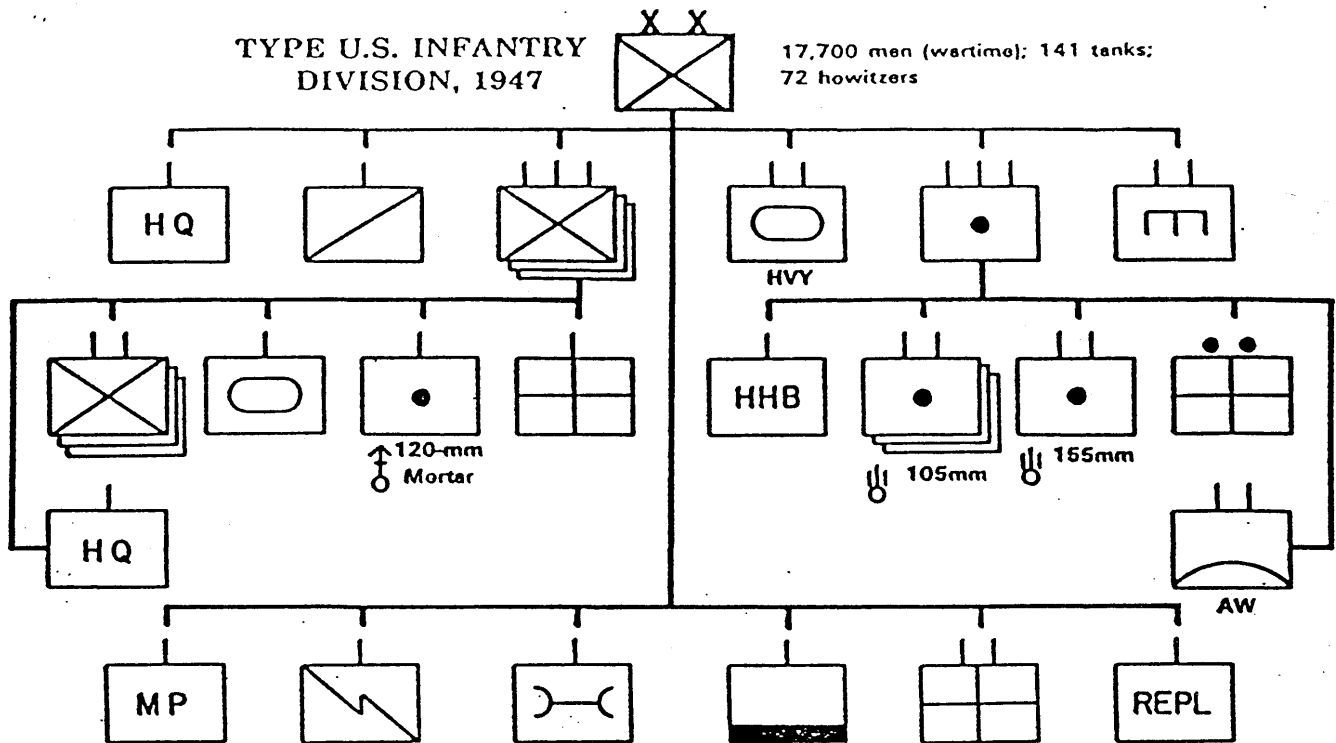
TYPE U.S. ARMORED DIVISION, MAR 1942



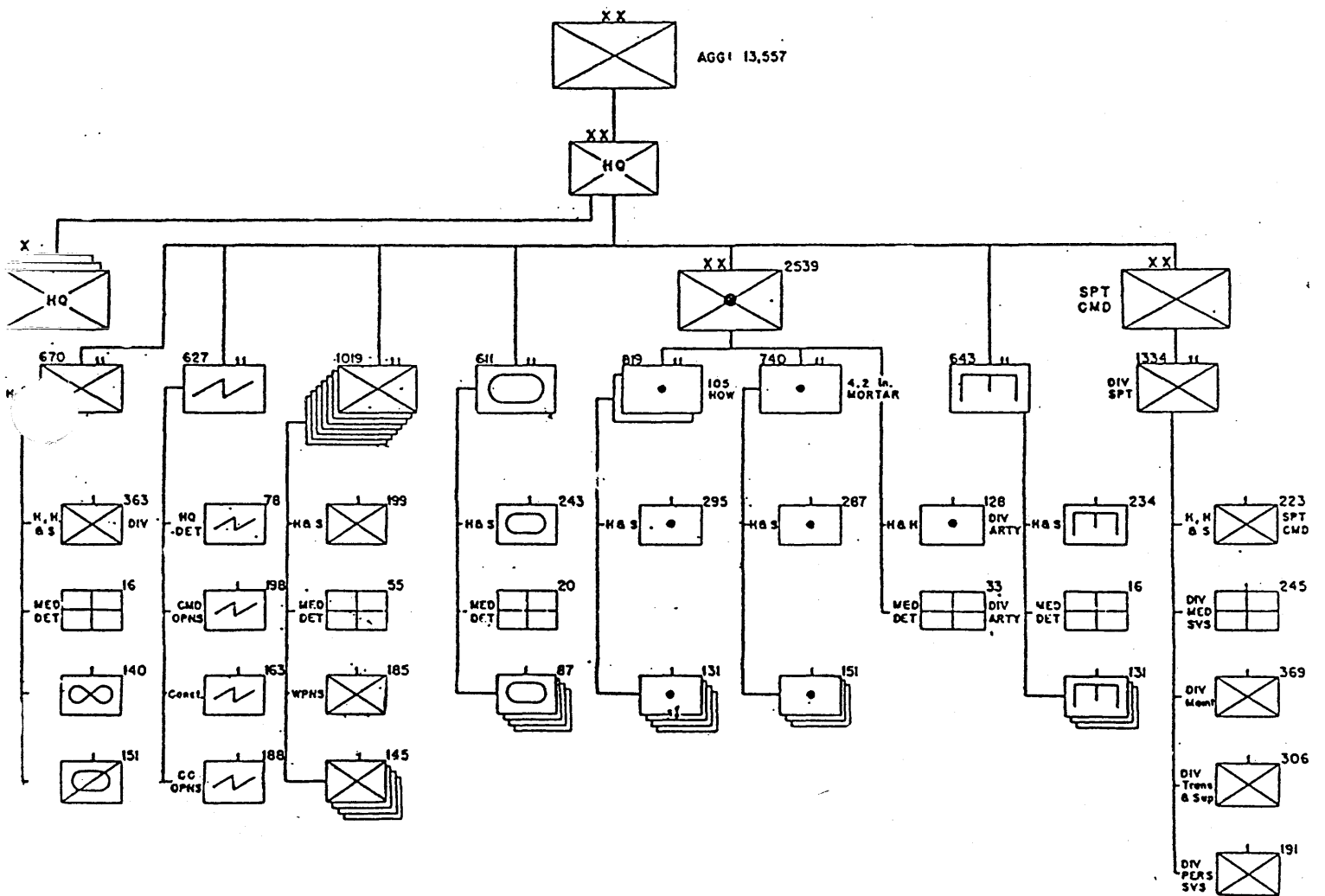
TYPE U.S. ARMORED DIVISION, SEP 1943



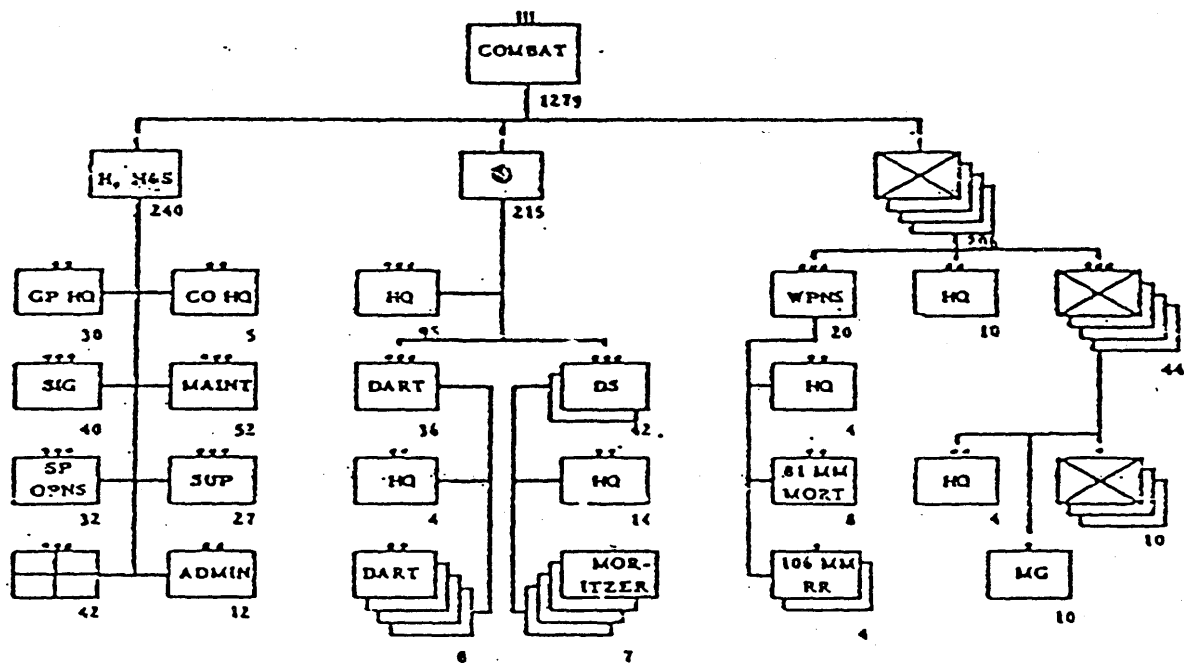
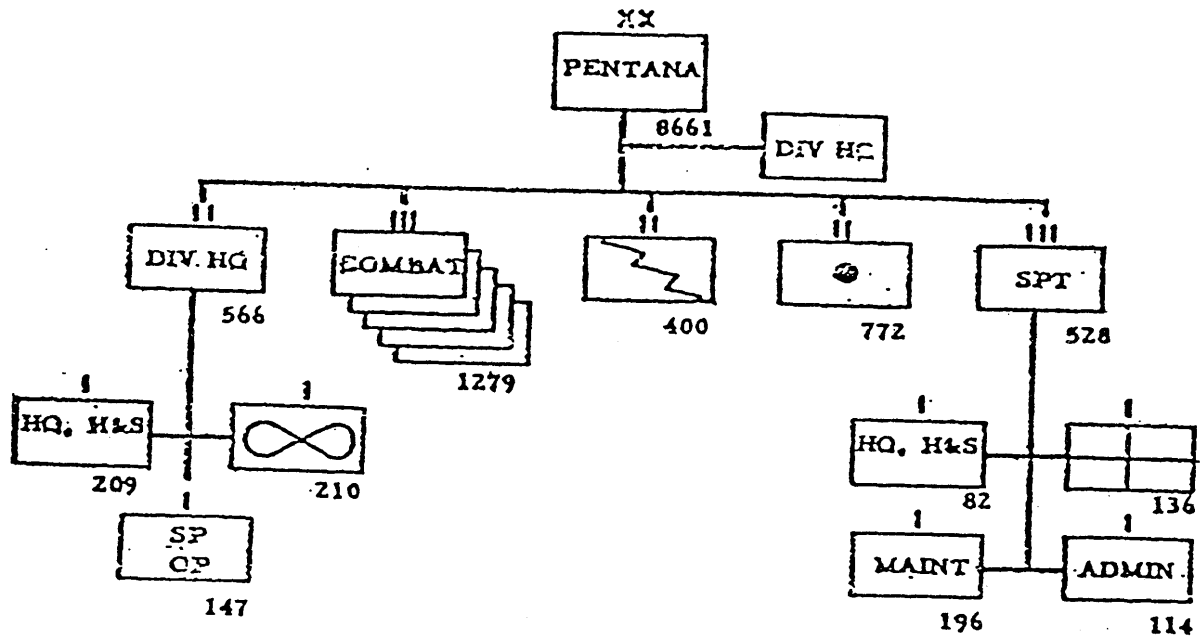
POST WW II TRIANGULAR DIVISION



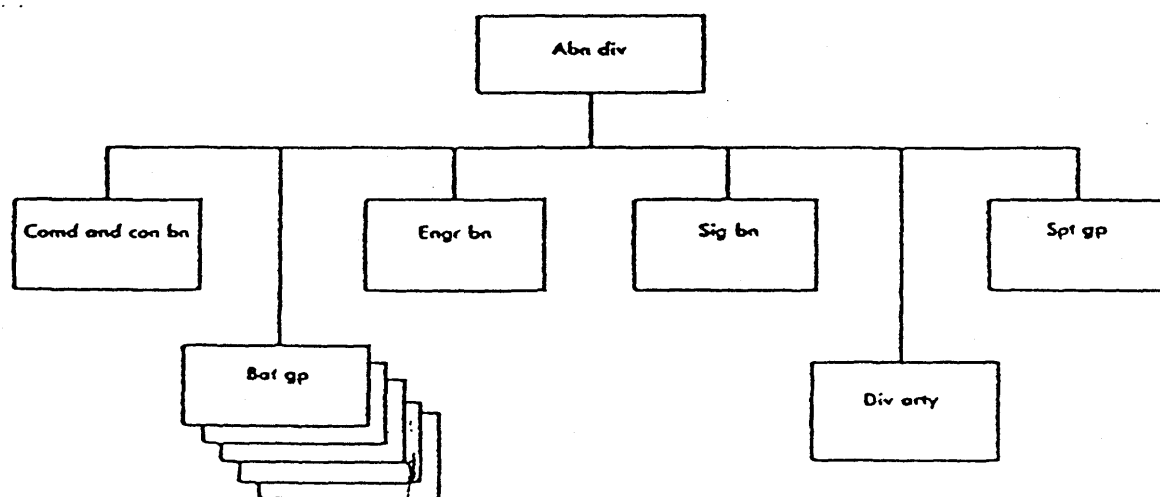
ATFA-1 INFANTRY DIVISION



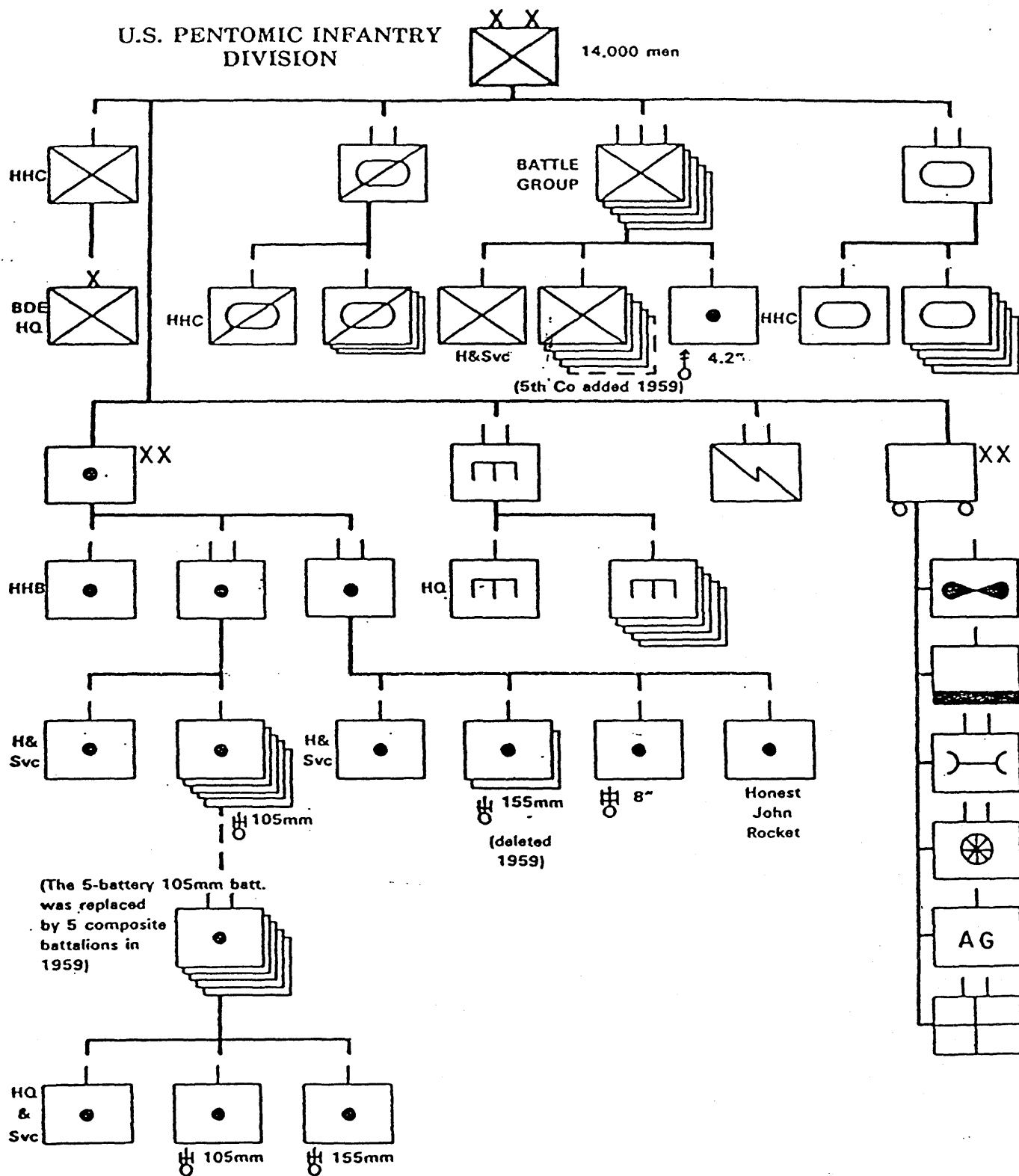
PENTANA DIVISION



REORGANIZATION OF THE AIRBORNE DIVISION (ROTAD)
PENTOMIC ARMY

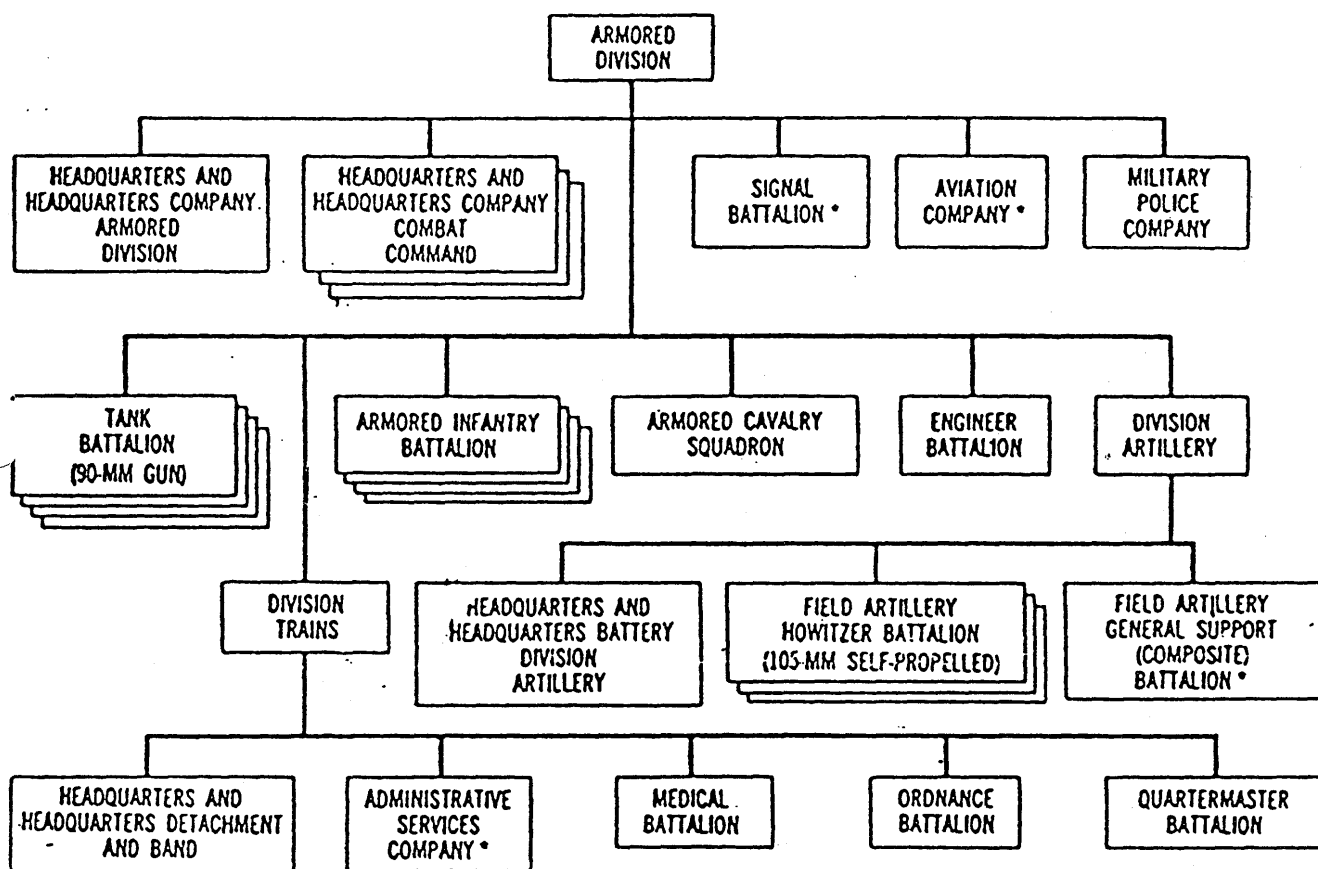


REORGANIZATION OF THE CURRENT INFANTRY DIVISION (ROCID)
PENTOMIC ARMY



REORGANIZATION OF THE CURRENT ARMORED DIVISION (ROCAD)
PENTOMIC ARMY

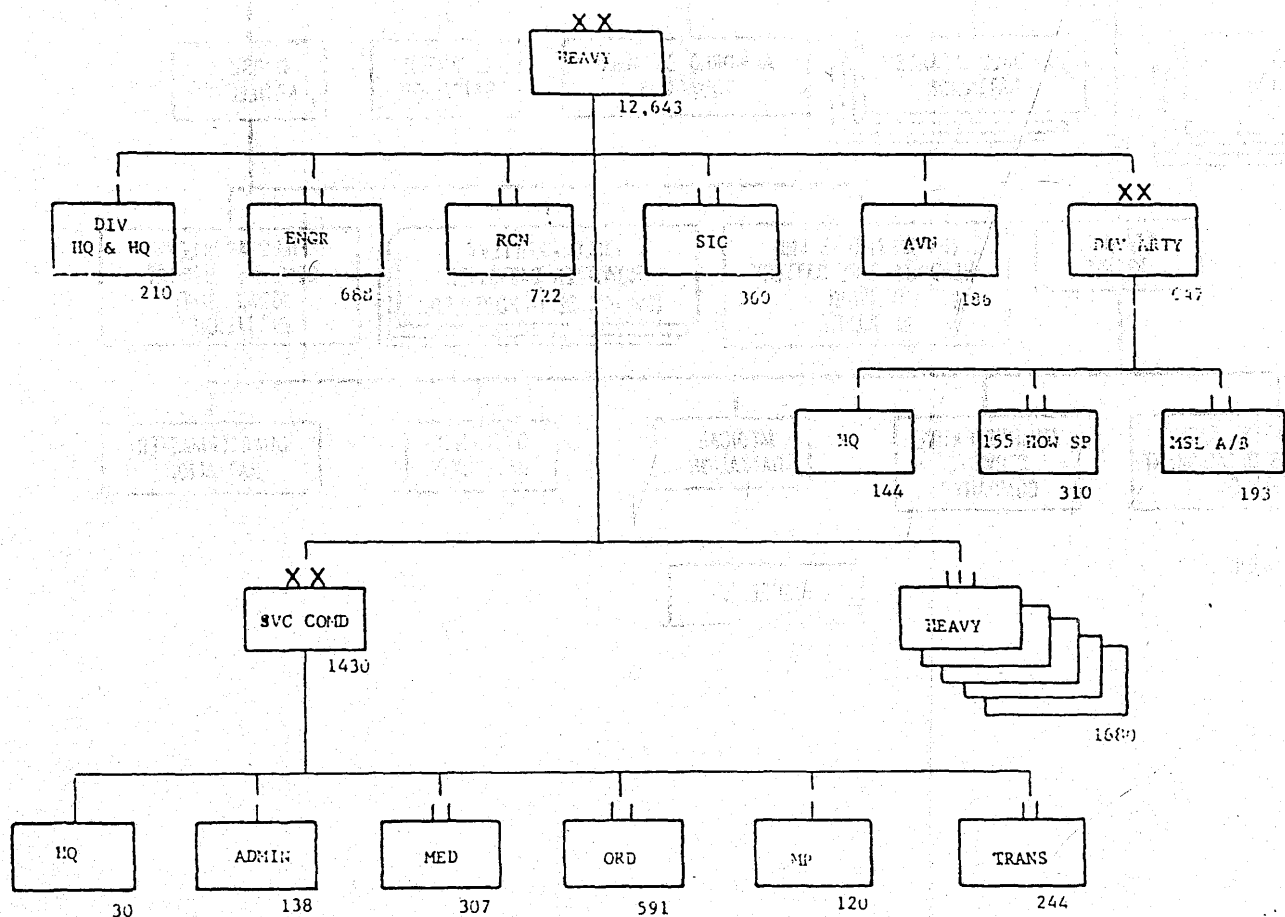
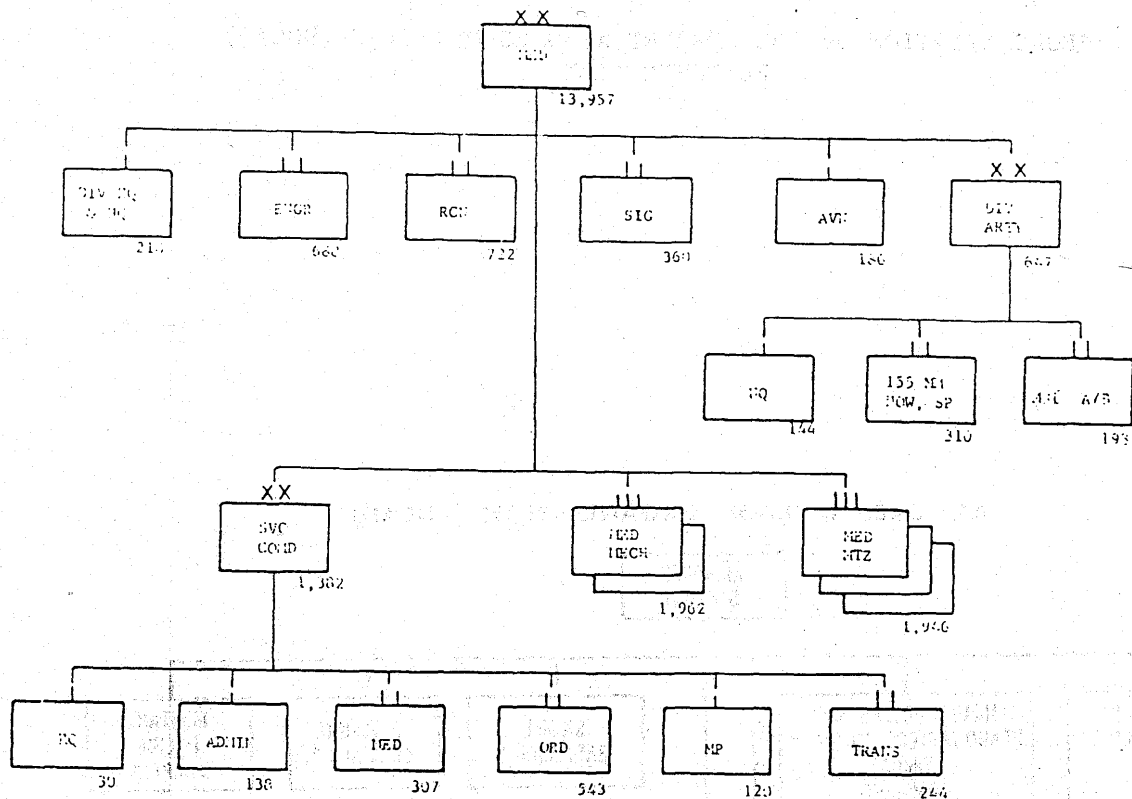
ARMORED DIVISION ORGANIZATION (ROCAD)



* NEW UNIT

FIGURE 1.

MOMAR I



ROAD DIVISION

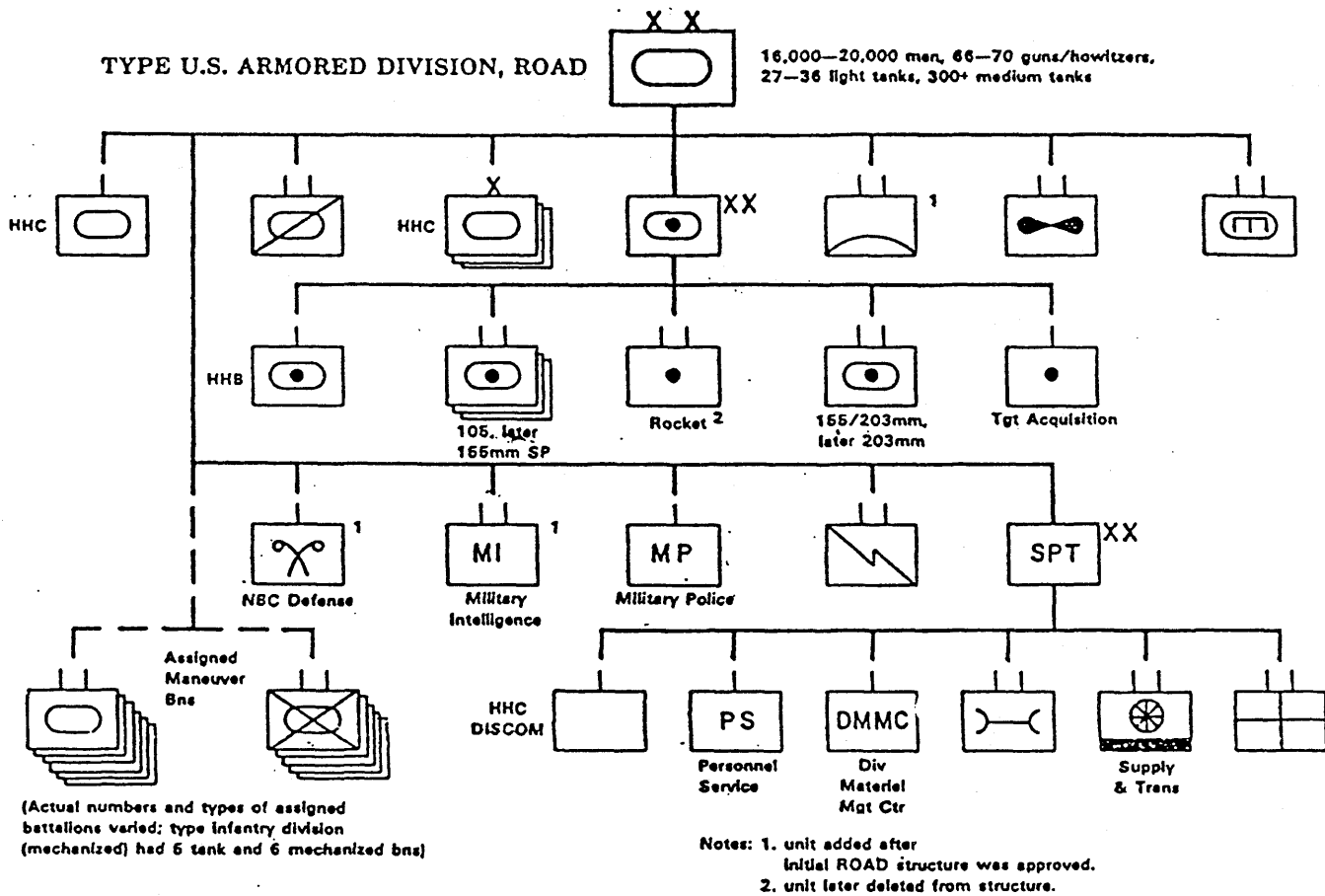
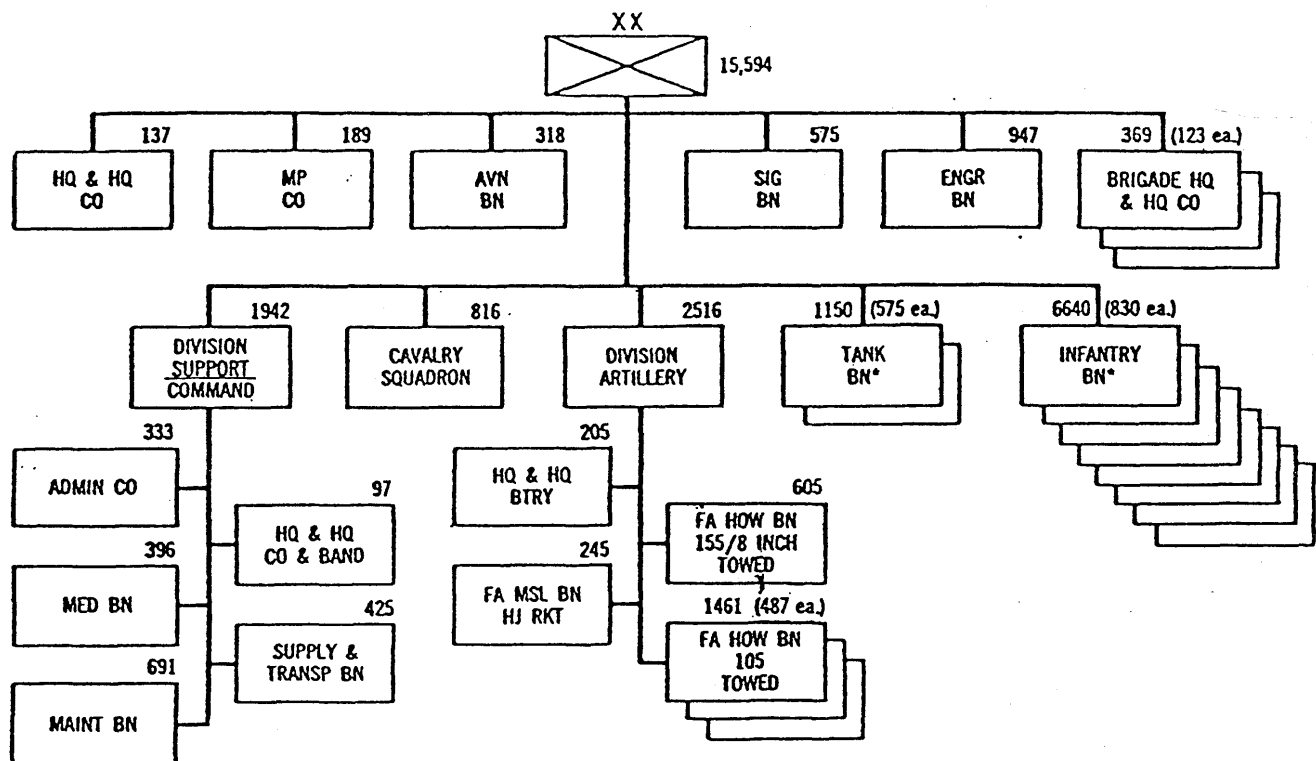


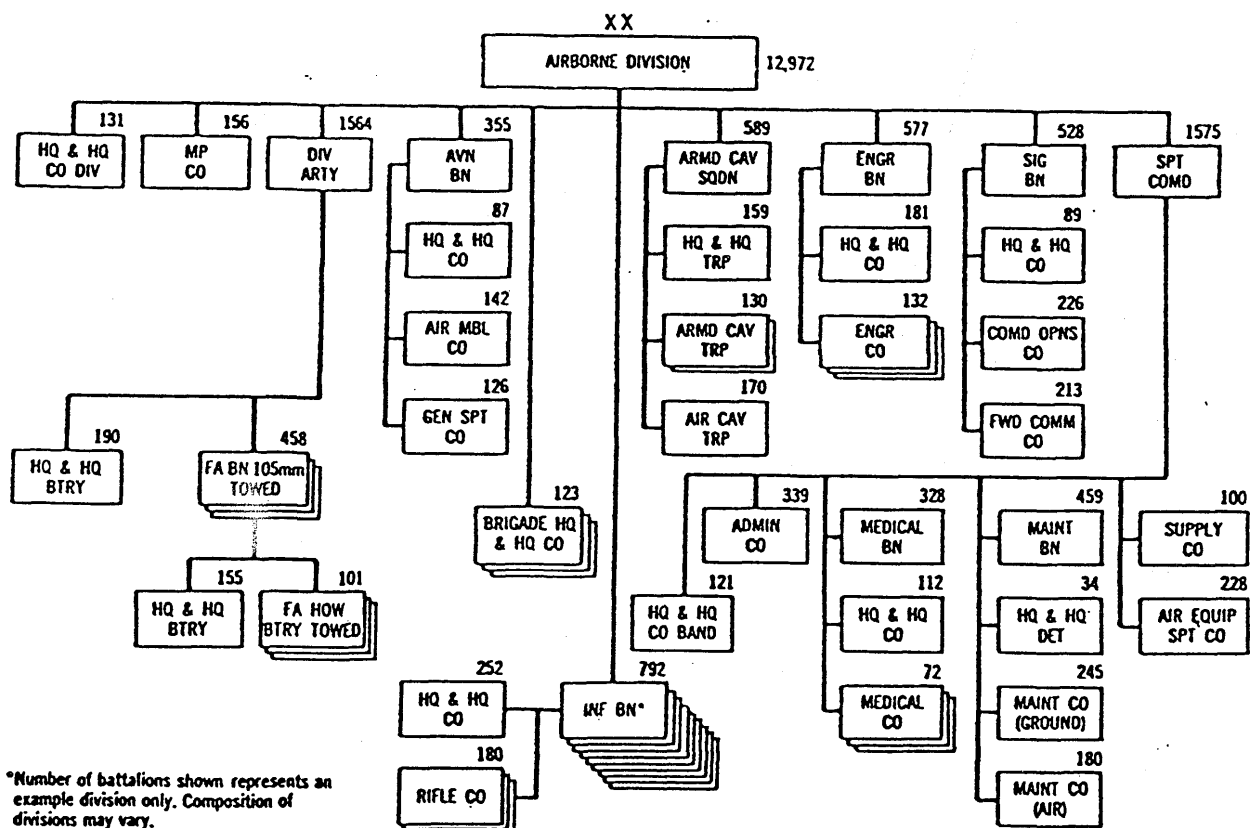
Figure 17. Type U.S. Armored Division, ROAD, 1965–1983.

Chart 1
INFANTRY DIVISION (ROAD)



*Number of battalions shown represents an example division only.
Composition of divisions may vary.

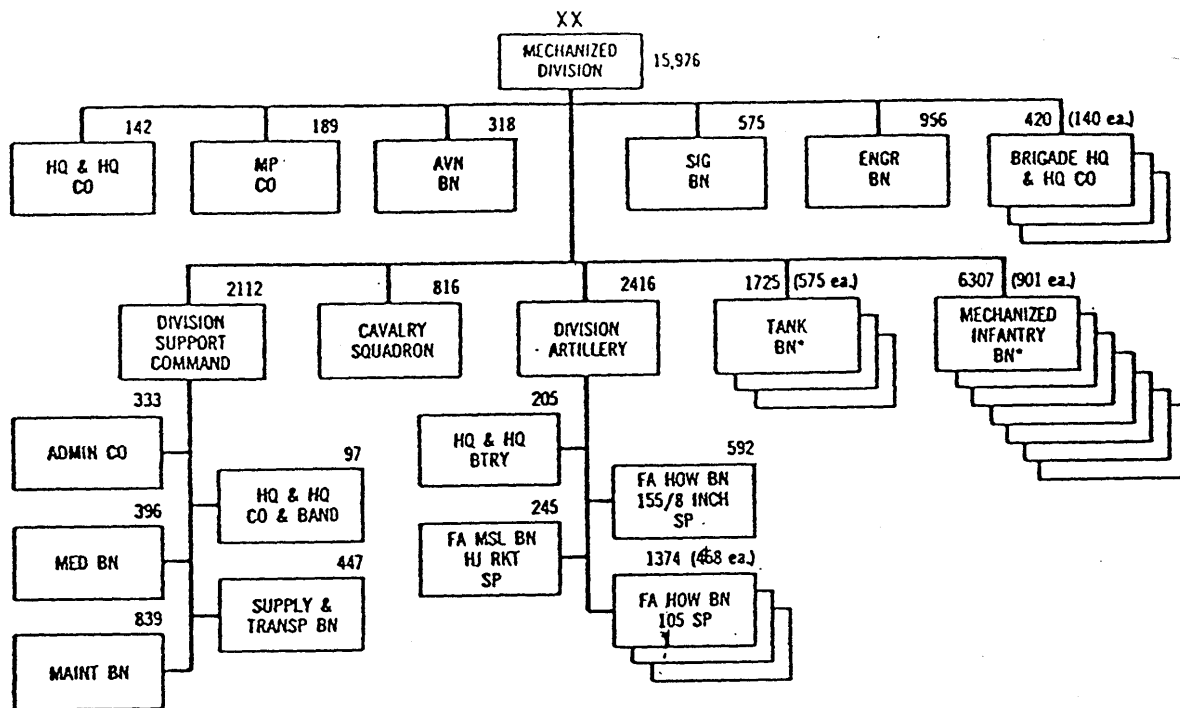
Chart 2
AIRBORNE DIVISION (ROAD)



*Number of battalions shown represents an example division only. Composition of divisions may vary.

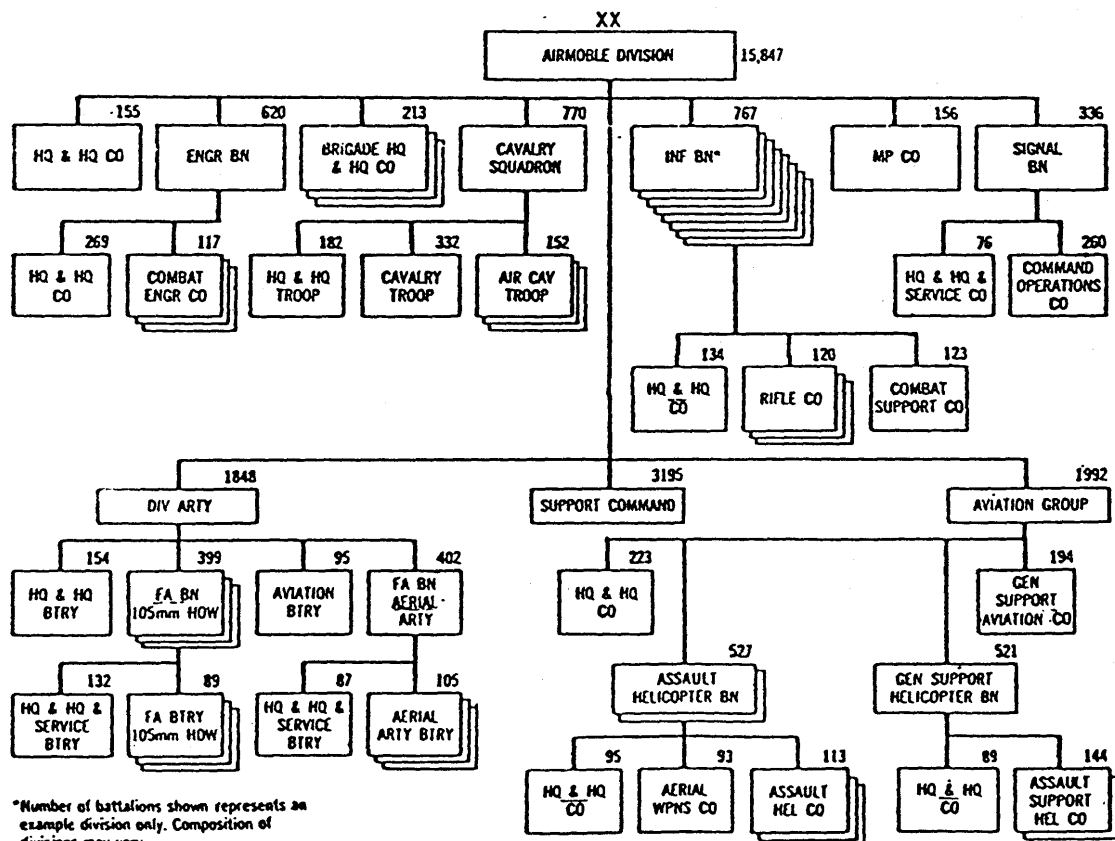
ROAD DIVISION

Chart 4
MECHANIZED DIVISION (ROAD)



*Number of battalions shown represents an example division only.
Composition of divisions may vary.

Chart 5
AIRMOBILE DIVISION (ROAD)



*Number of battalions shown represents an example division only. Composition of divisions may vary.

AIRMOBILE DIVISION

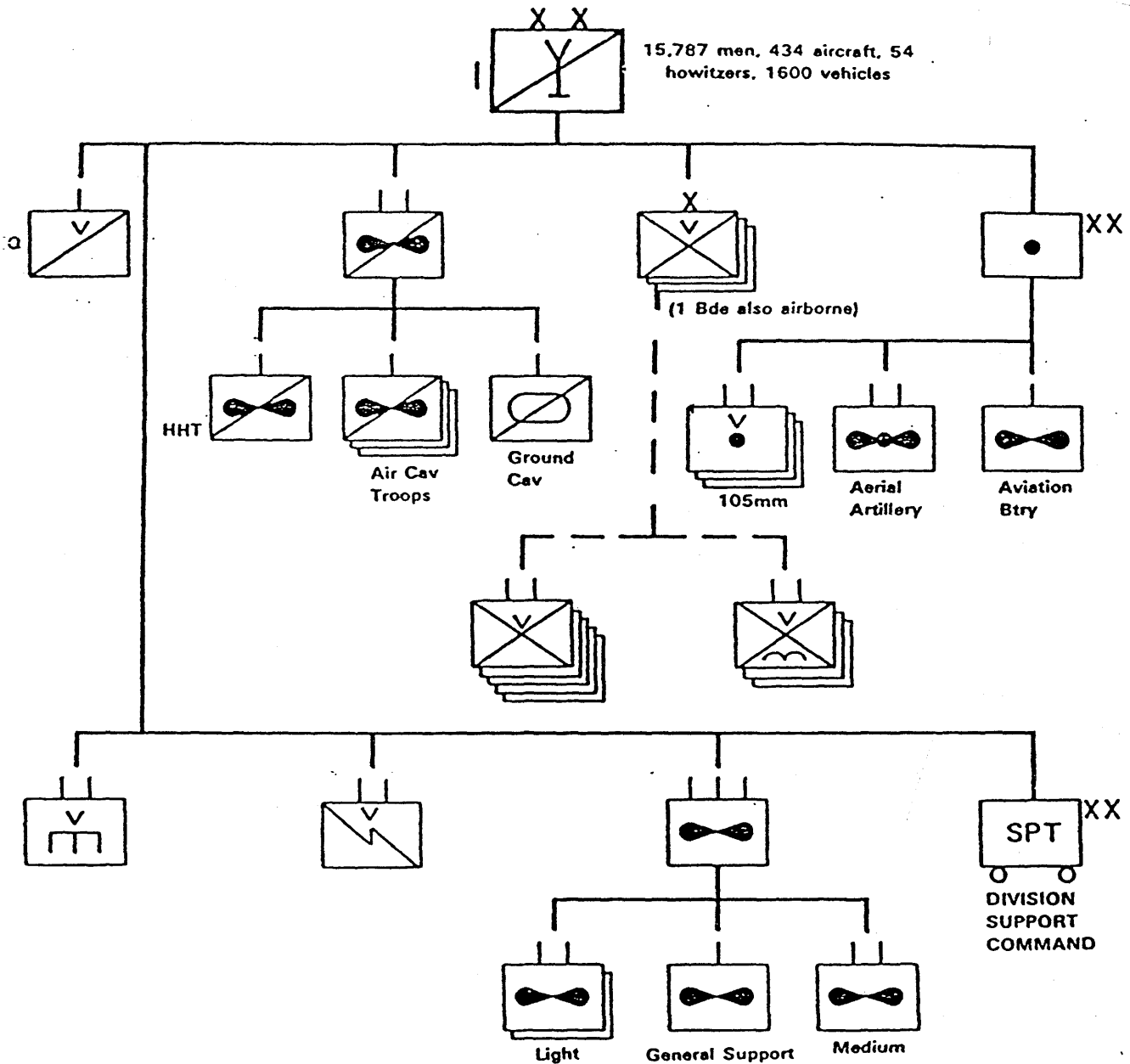
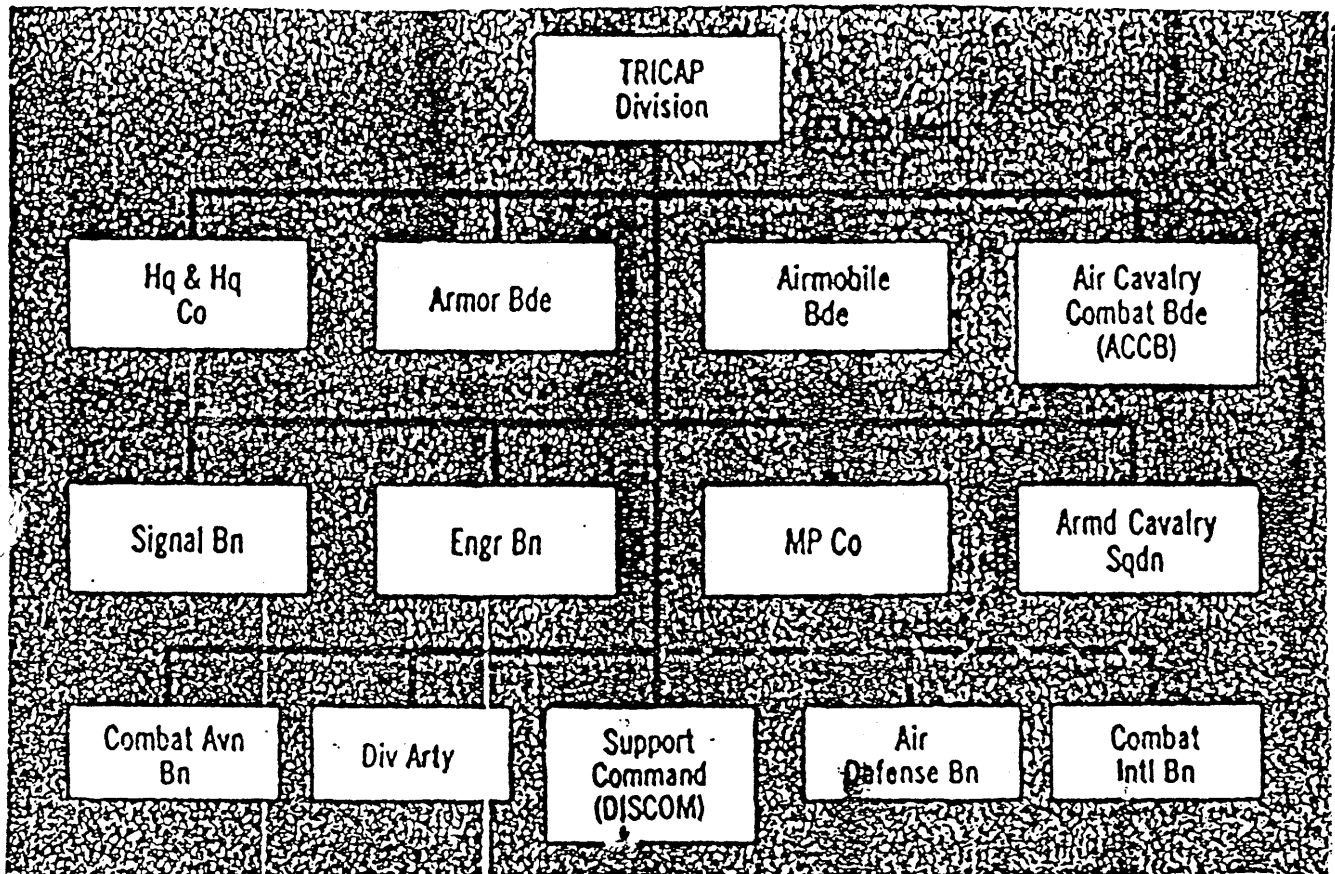


Figure 18. 1st Cavalry Division (Airmobile), 1965.

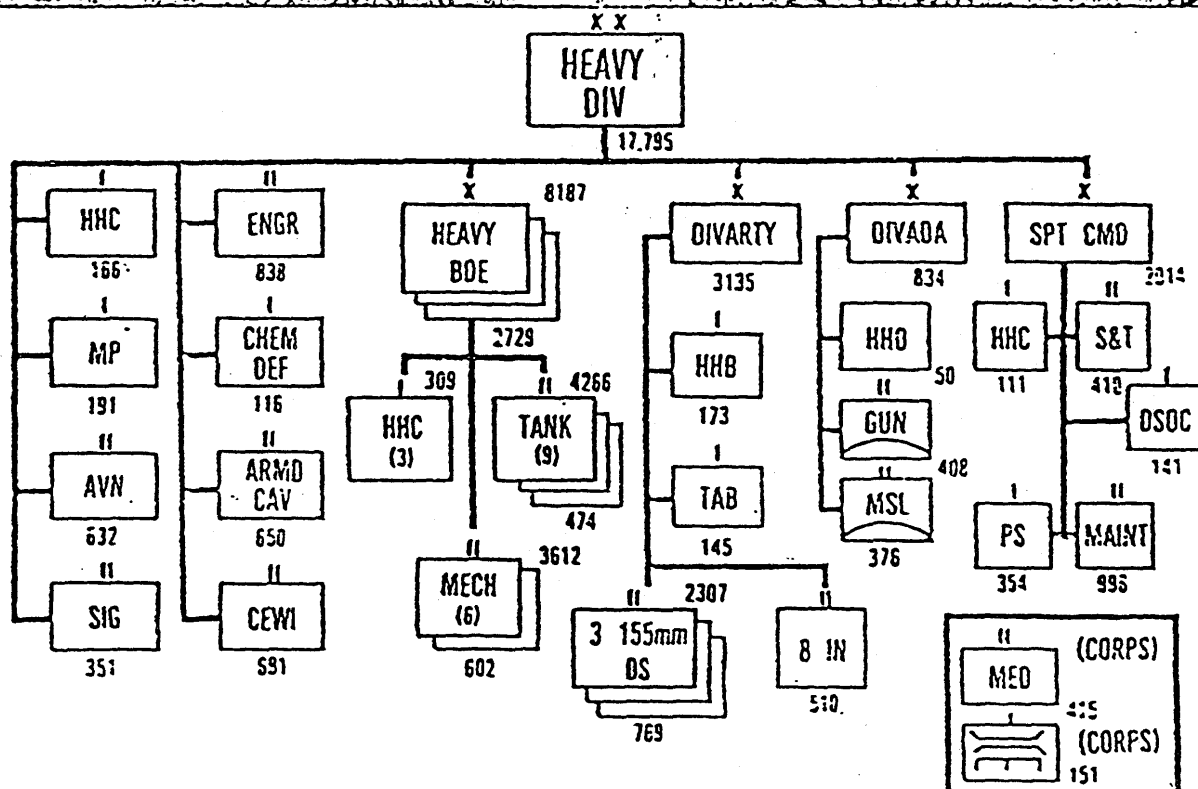
TRICAP DIVISION



DIVISION RESTRUCTURING STUDY (DRS) DIVISION

HEAVY DIVISION

(CONCEPTUAL)



DIVISION 86
ARMY 86 STUDY

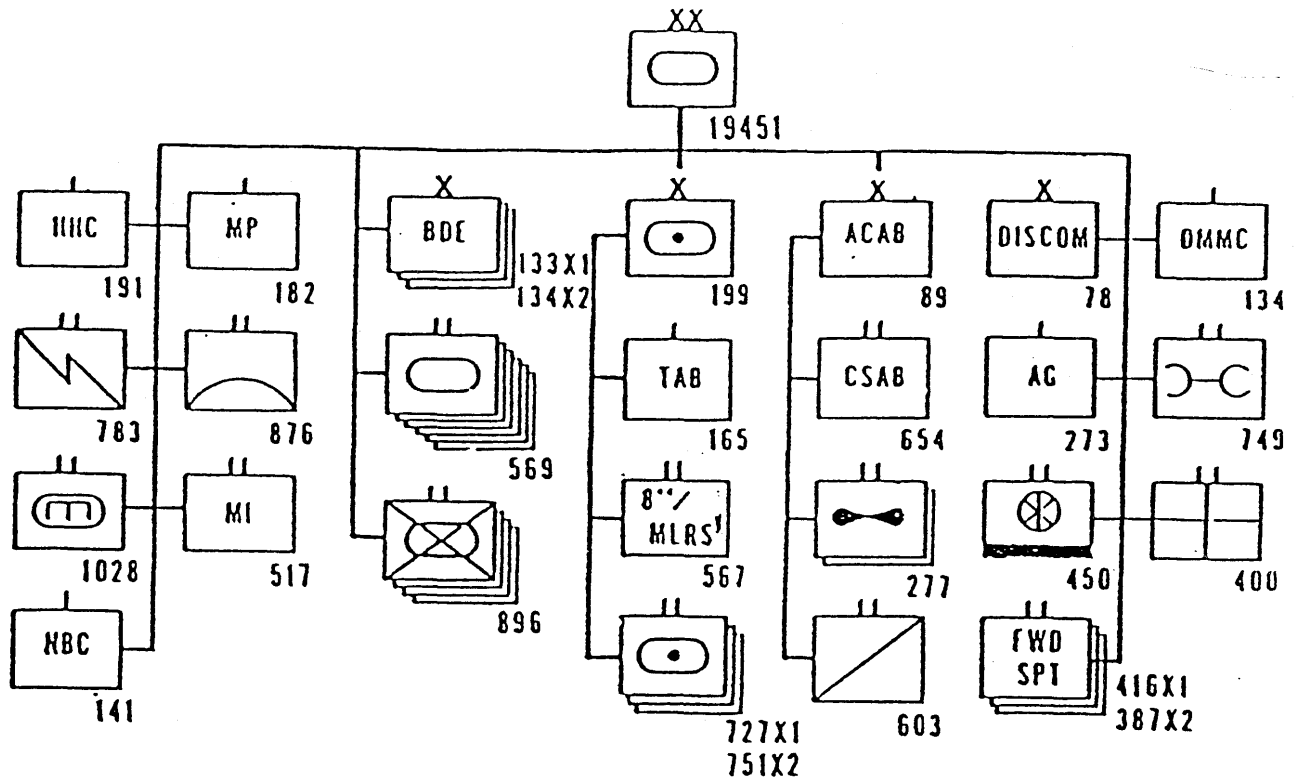


Figure 5. Division 86 Armored Division

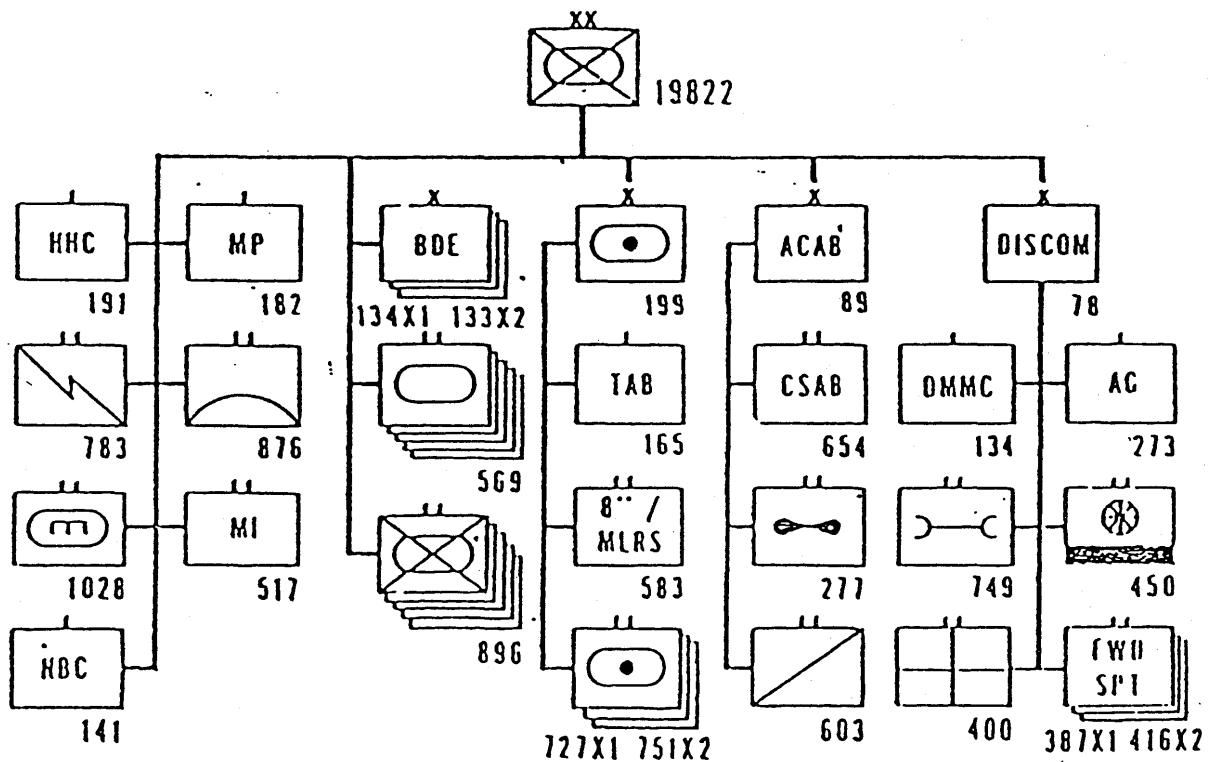


Figure 6. Division 86 Mechanized Division

CHART 11 - FIXED BRIGADE

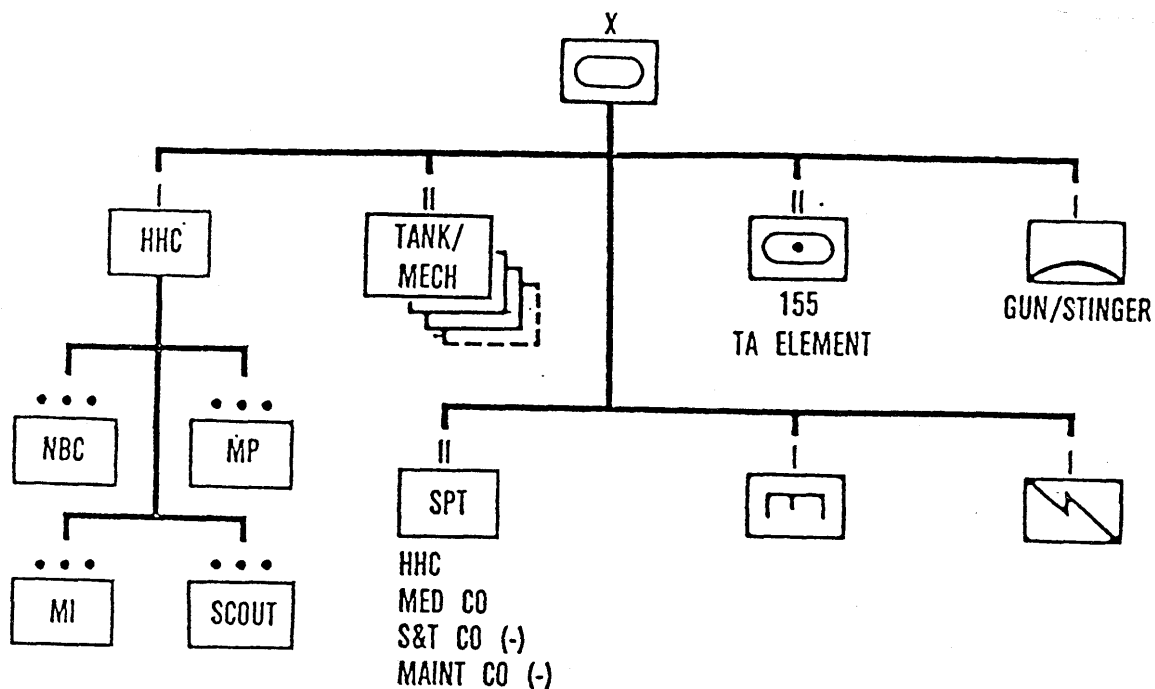
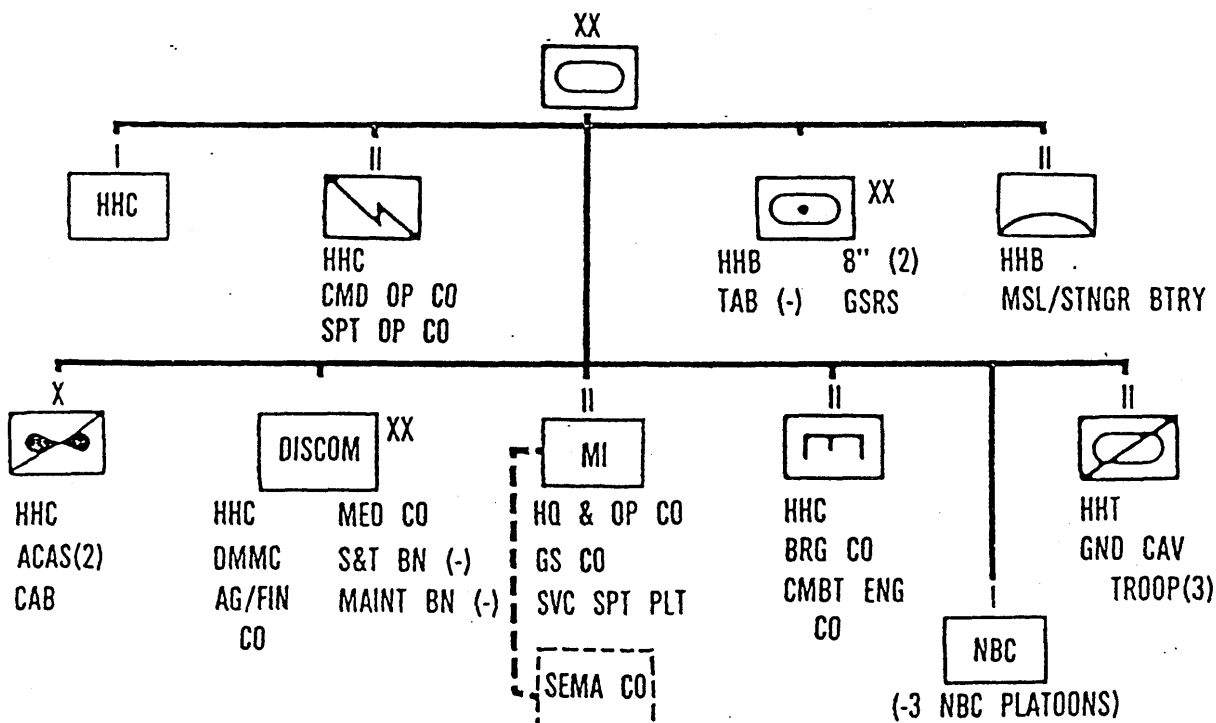
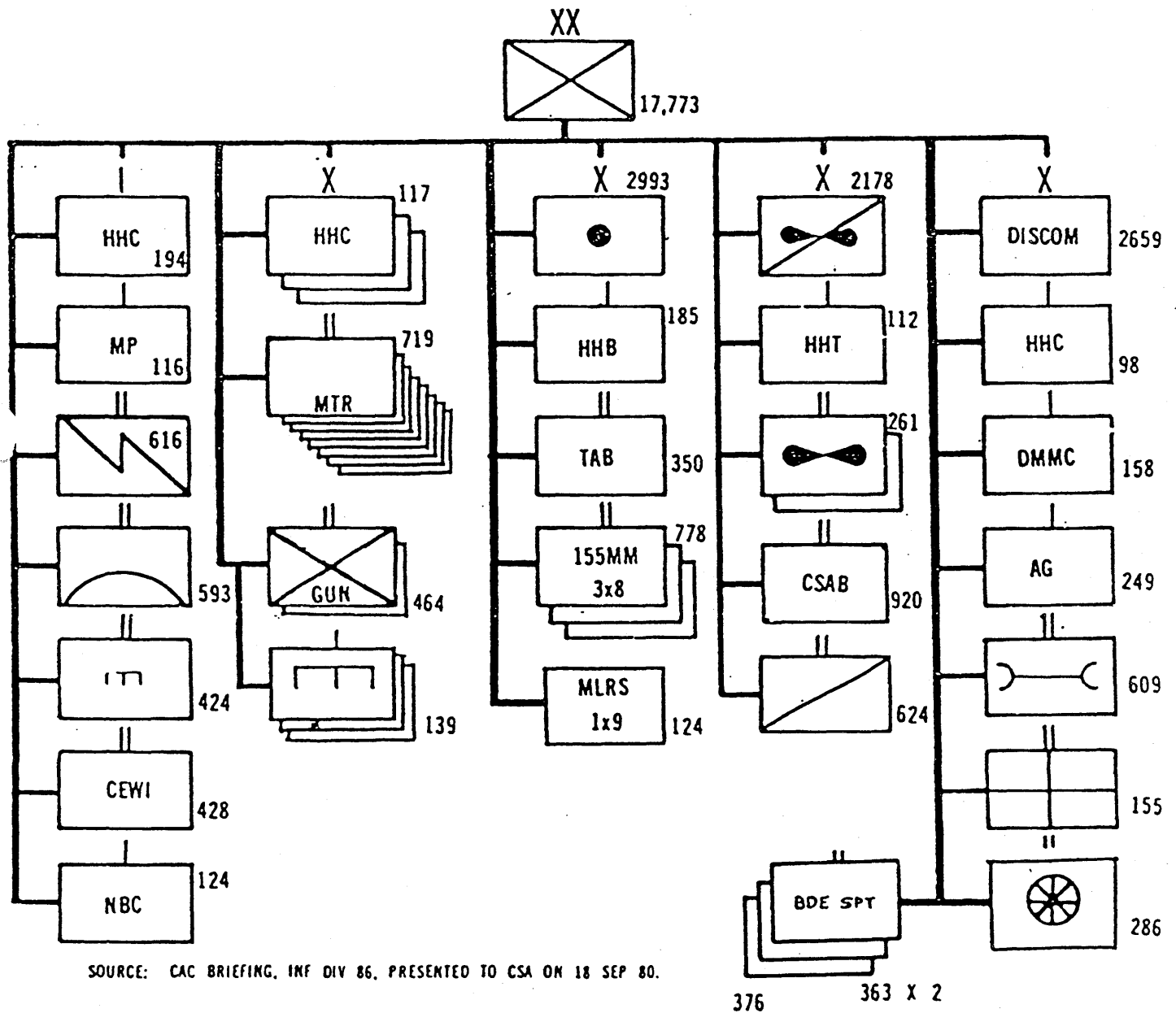


CHART 12 - FIXED BRIGADE - DIVISION BASE



INFANTRY DIVISION 86
ARMY 86 STUDY

HART 7 - INFANTRY DIVISION 86 THE LIGHT DIVISION (18 SEPTEMBER 1980)



INFANTRY DIVISION 86
ARMY 86 STUDY

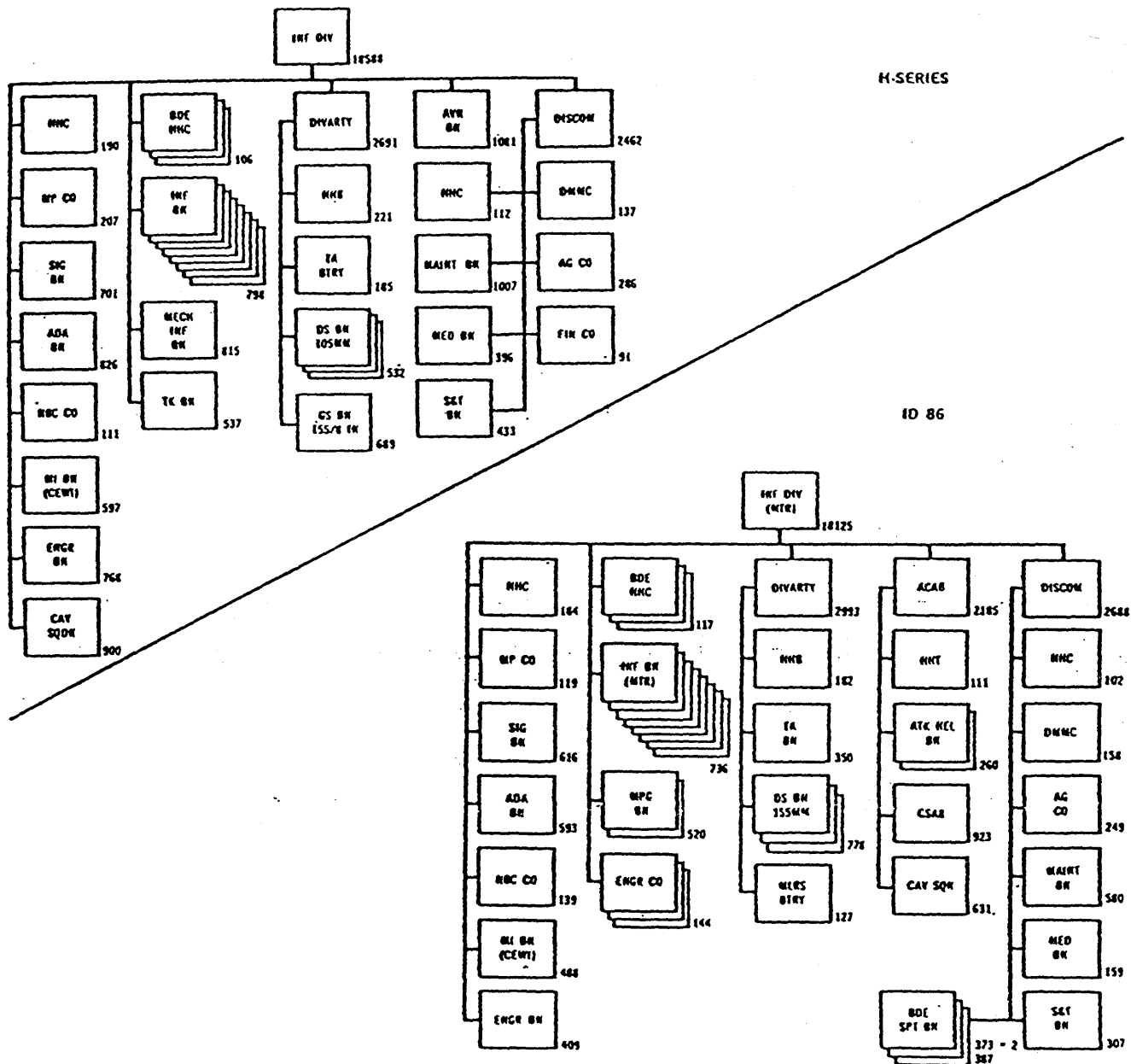
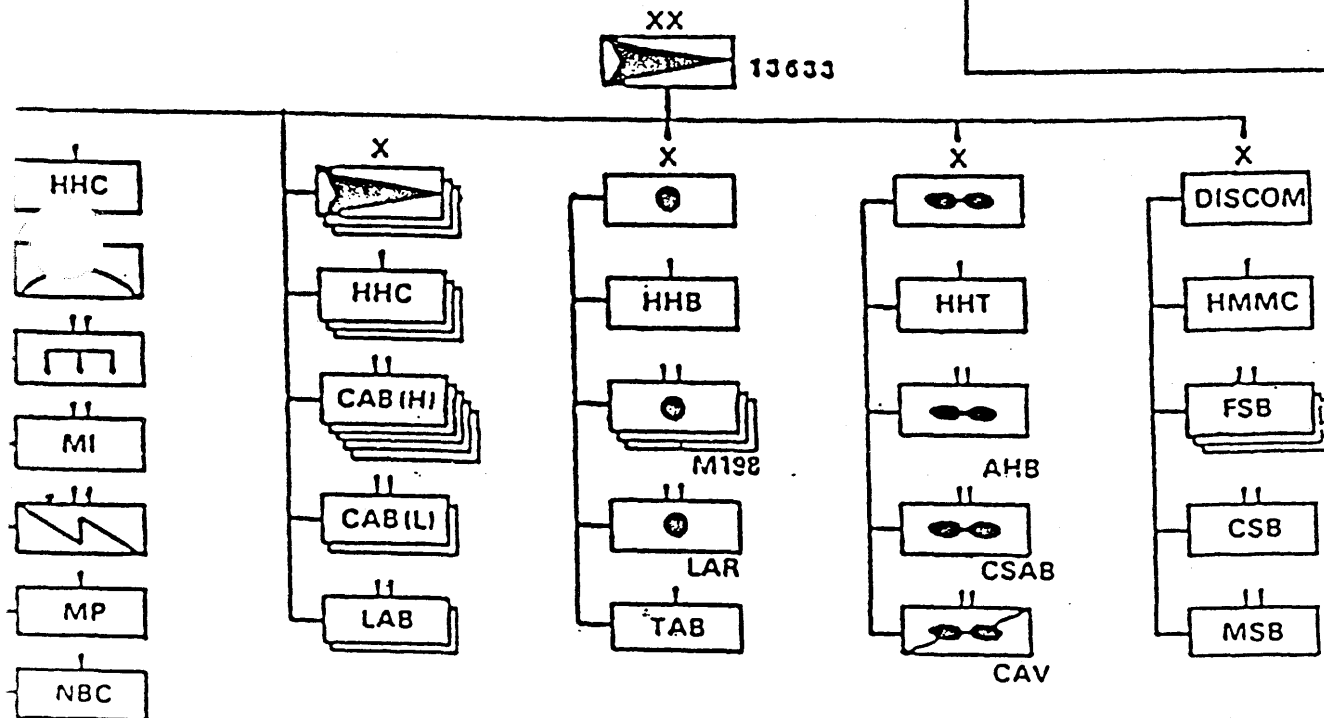


Figure 13. Comparison of H-series and ID86 division

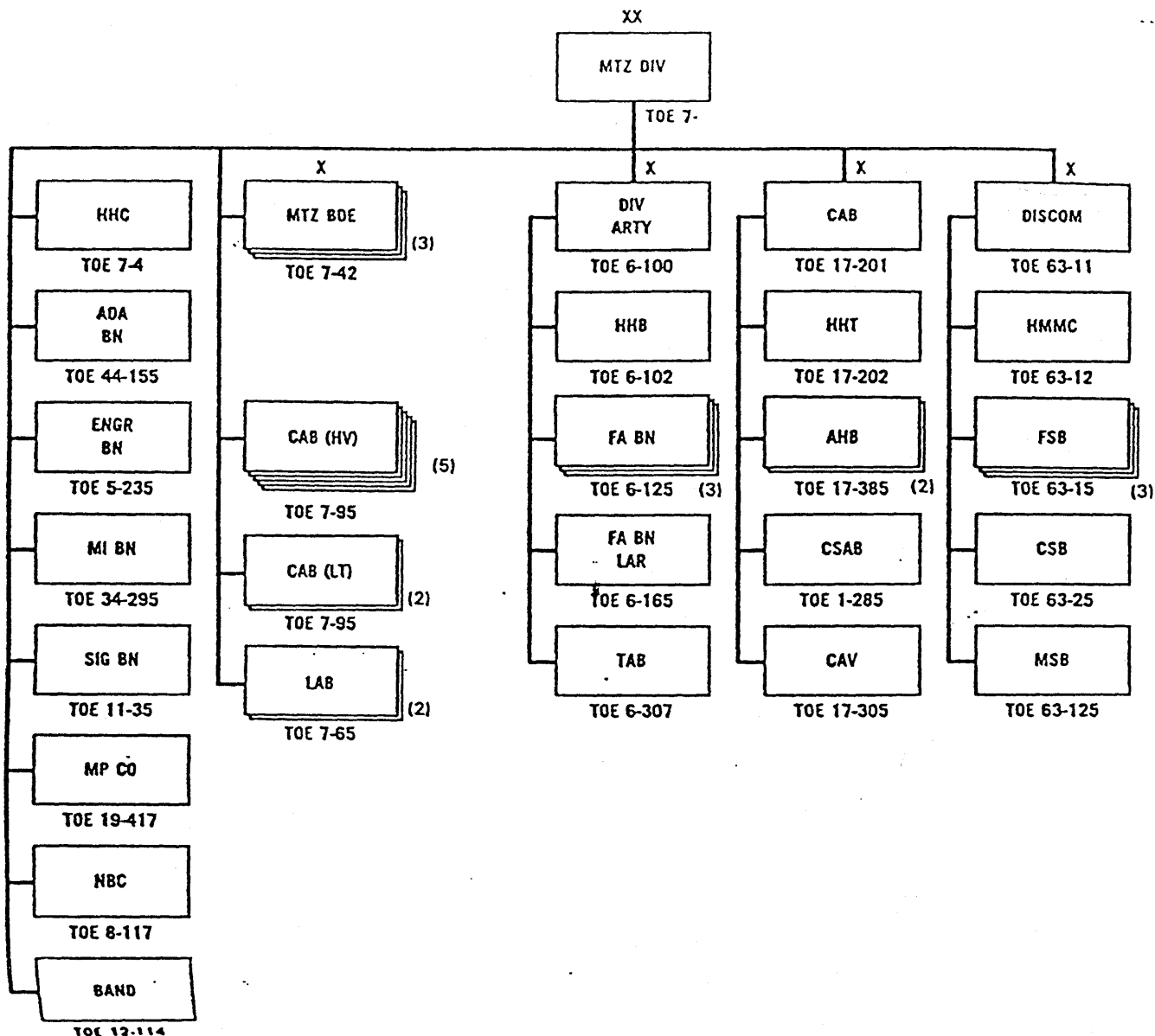
9ID(MTZ) OBJECTIVE DESIGN

SYSTEM	QUANTITY
AGS	166
GLH	36
AT VEH	66
MLRS	9
155MM	54
105MM	12

KE + MSL = TOTAL AT SYSTEMS
166 + 102 = 268



INFANTRY DIVISION (MOTORIZED)



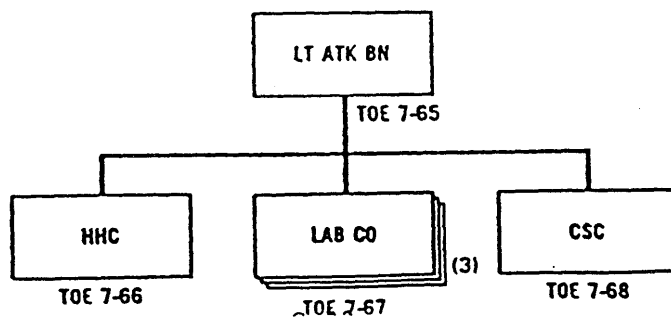
INFANTRY BATTALION, LIGHT ATTACK
INFANTRY DIVISION (MOTORIZED)

VEHICLES

104 HHMWV
46 FAV
18 5-TON
8 MOTORCYCLES

WEAPONS

75 MK-19 GMG.
27 TOW
6 MORTAR



MOTORIZED DIVISION (HTLD) 1987

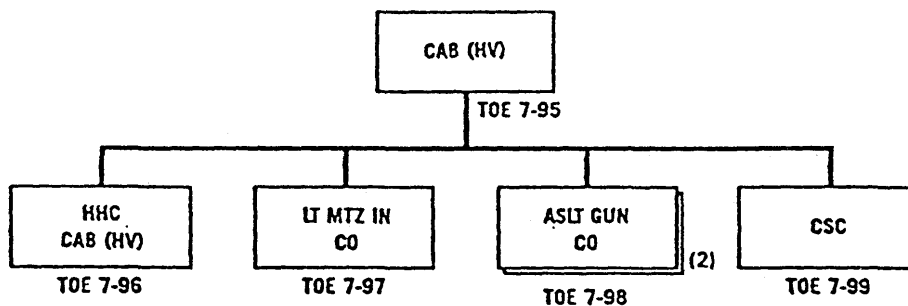
COMBINED ARMS BATTALION (HEAVY)

EQUIPMENT

79 HMMWV
40 HMMWV TOW
10 FAV
21 5-TON
8 MOTORCYCLES

WEAPONS

56 MK-19 GMG
40 TOW WPNS
15 DRAGON/AAWS
6 MORTAR



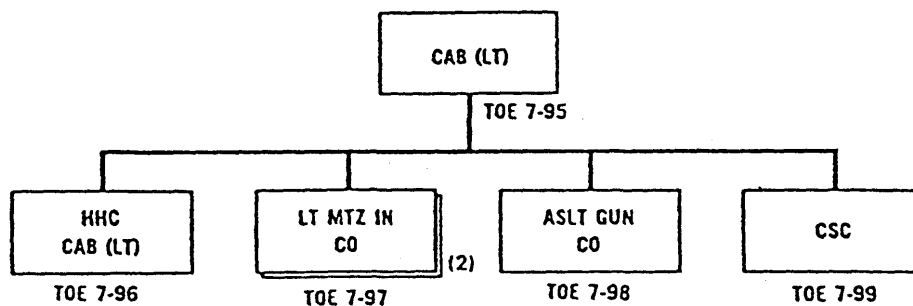
COMBINED ARMS BATTALION (LIGHT)

VEHICLES

100 HMMWV
20 HMMWV TOW
21 5-TON
8 MOTORCYCLES

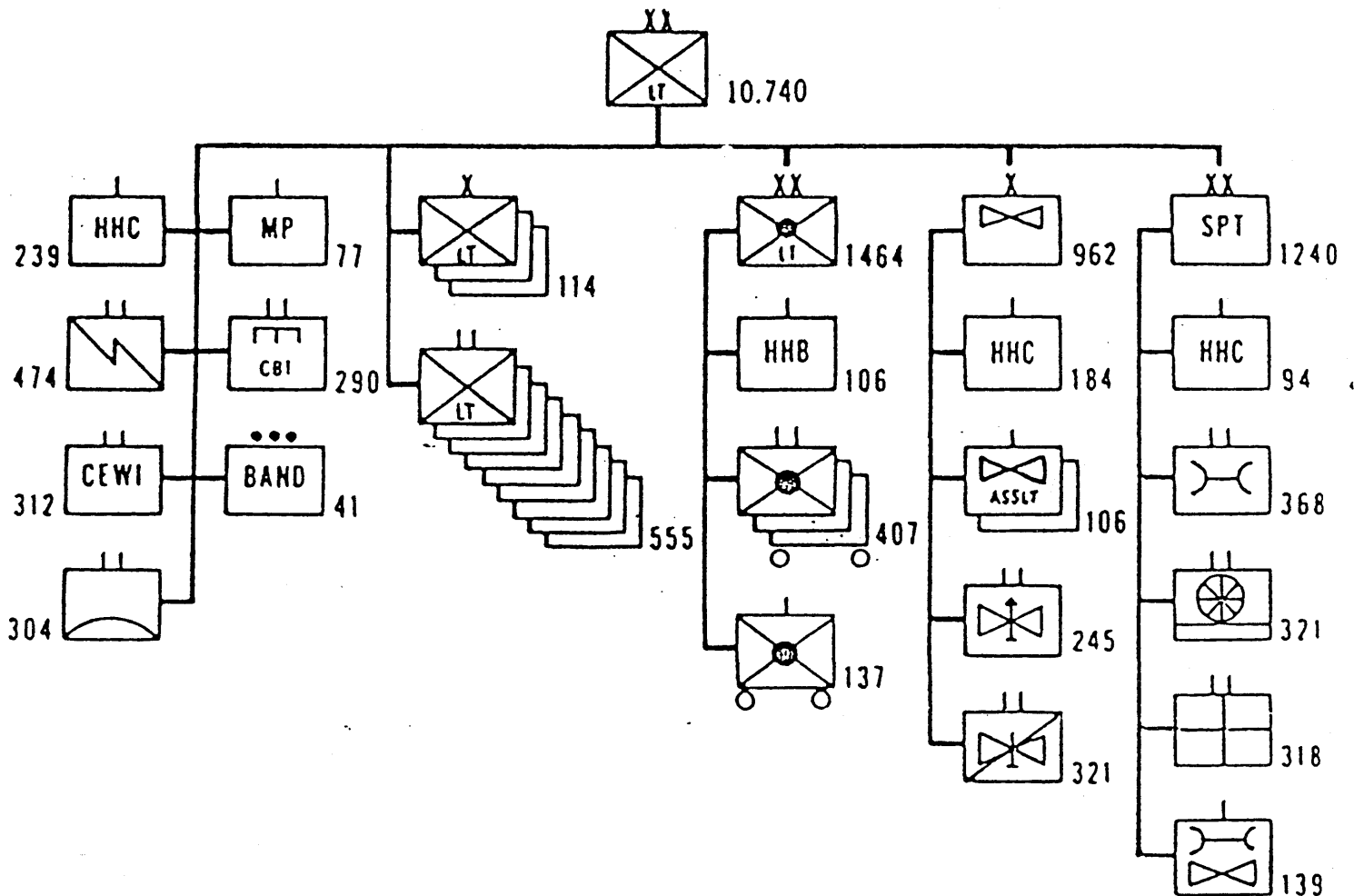
WEAPONS

60 MK-19 GMG
20 TOW WPNS
30 DRAGON/AAWS
6 MORTAR



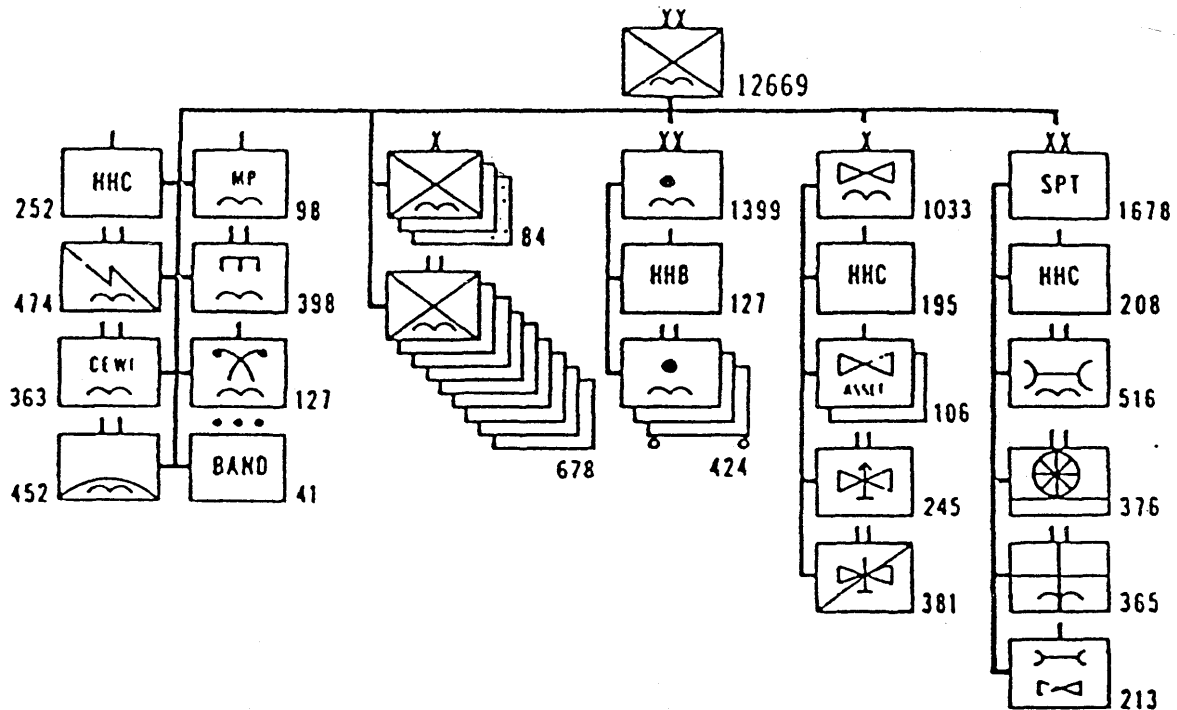
LIGHT INFANTRY DIVISION
ARMY OF EXCELLENCE (AOE)

INFANTRY DIVISION (LIGHT)

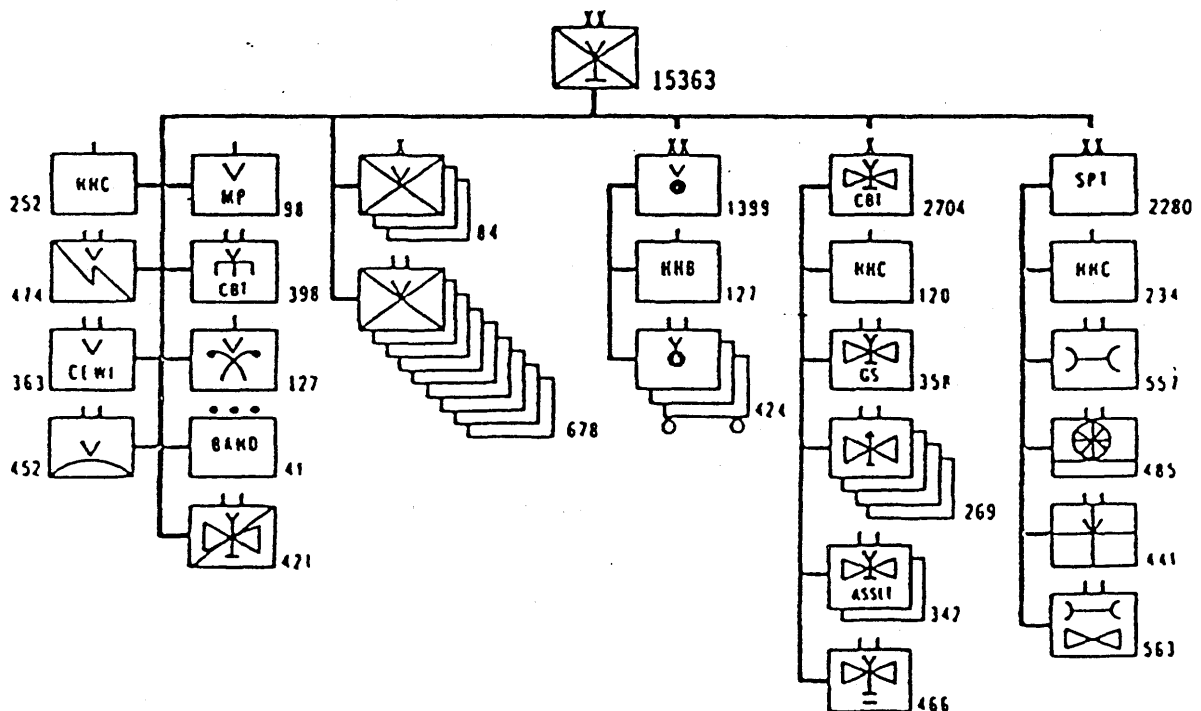


AIRBORNE/AIRMOBILE DIVISIONS
ARMY OF EXCELLENCE (AOE)

INFANTRY DIVISION (AIRBORNE)



INFANTRY DIVISION (AIR ASSAULT)



ARMOR DIVISION
ARMY OF EXCELLENCE (AOE)

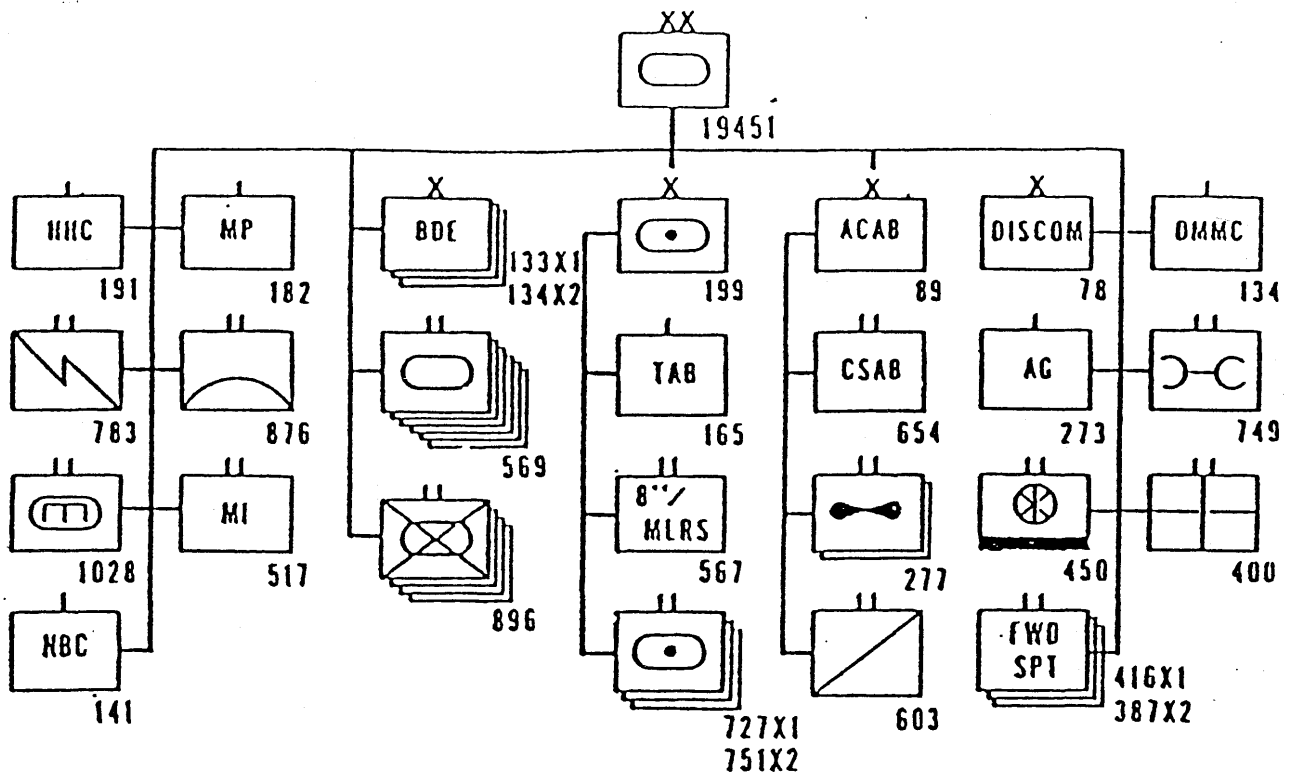


Figure 5. Division 86 Armored Division

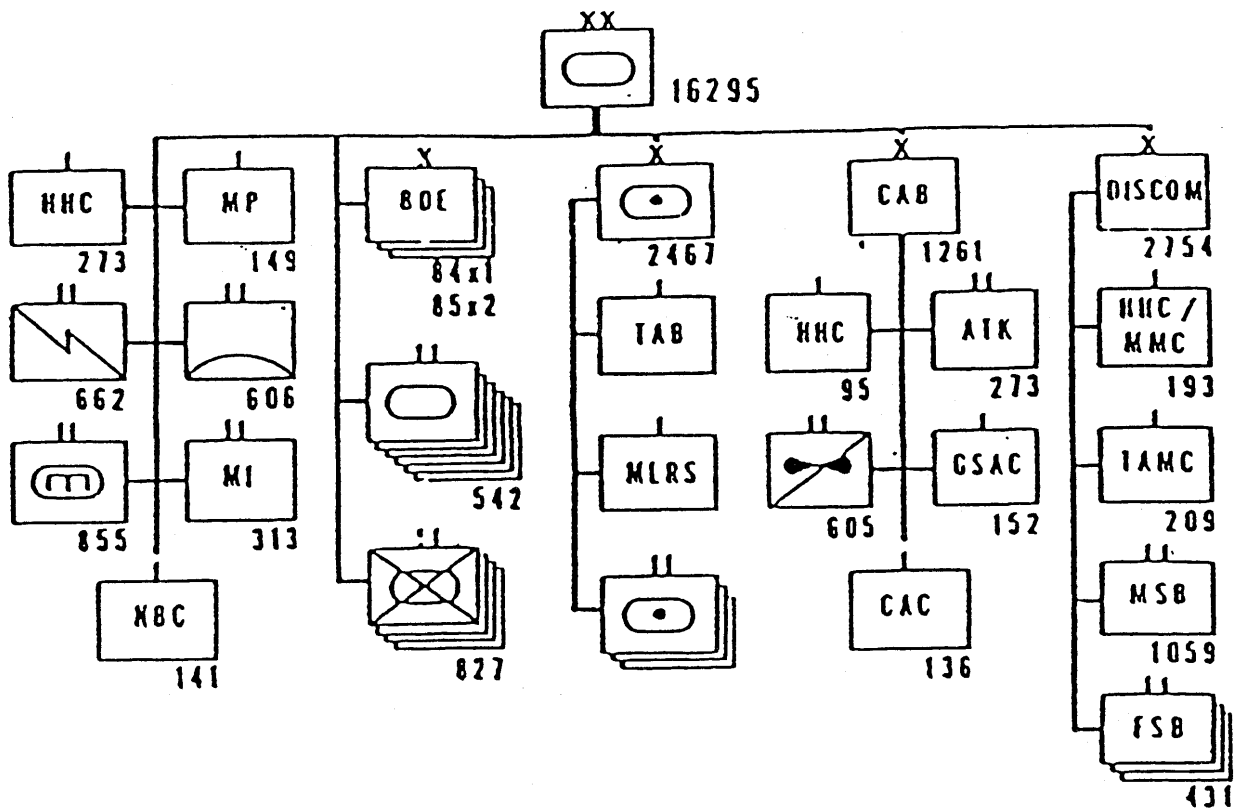


Figure 7. Revised Armored Division

MECHANIZED INFANTRY DIVISION
ARMY OF EXCELLENCE (AOE)

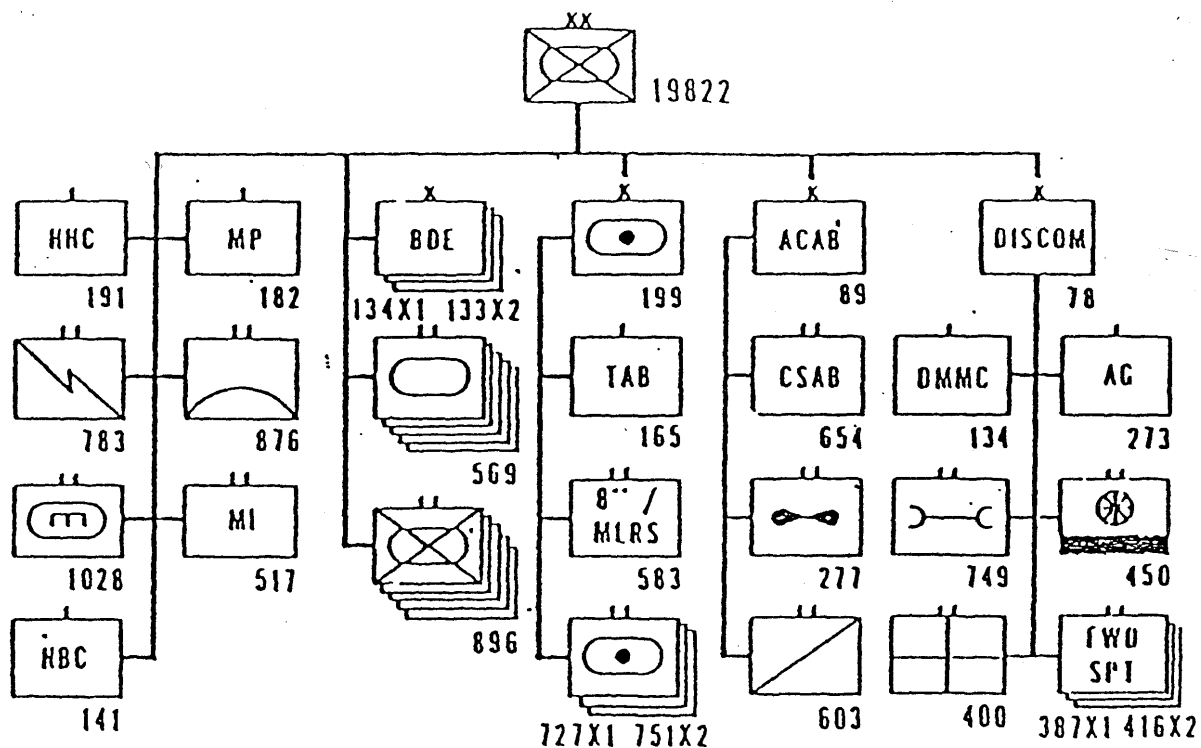


Figure 6. Division 86 Mechanized Division

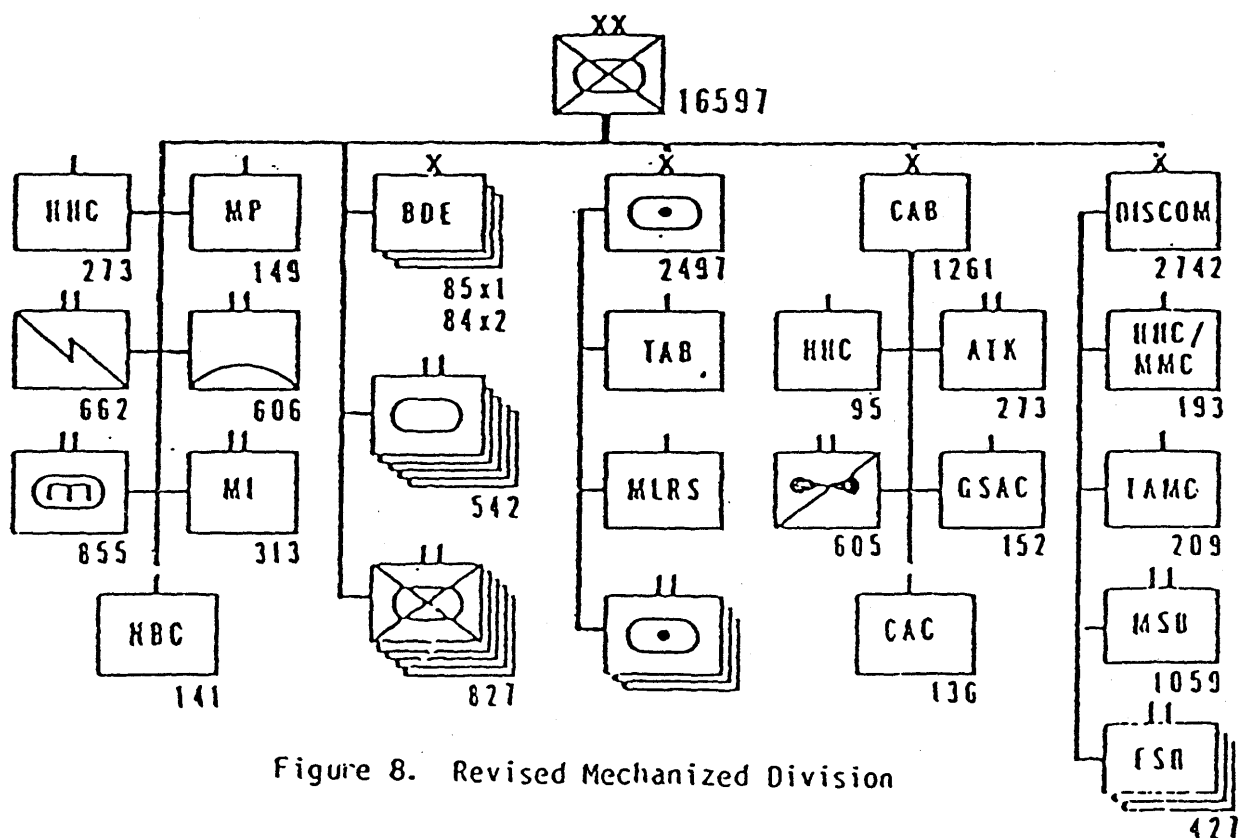


Figure 8. Revised Mechanized Division