# U.S. ARMY FIELD ARTILLERY CENTER AND FORT SILL

# ANNUAL COMMAND HISTORY

**(RCS CHIS-6 [R3])**

**1 JANUARY 1999 THROUGH 31 DECEMBER 1999**

**BY**

**COMMAND HISTORIAN'S OFFICE**

**JUNE 2000**

FORT SILL, OKLAHOMA

## Commander's Introduction

This Annual Command History captures the major events at Fort Sill during 1999. We are confident that our many important initiatives will have an impact on the Field Artillery and Total Army for years.

In 1999 Fort Sill made great progress in doctrine, training, force design, equipment, and leader development. Key efforts included improving the Field Artillery Officer Basic Course and the Captain's Career Course and participating in the Transformation of the Army effort. A few of the key issues that influenced overall installation operations were preparations for the Year 2000, budget reductions, and Fort Sill's continuing commitment to a community of excellence to ensure a high quality of life for the installation's soldiers, Marines, civilians, and family members.

Fort Sill continues to serve as the Center for Fire Support for the United States Army and Marine Corps. The Field Artillery also continues in its proud tradition of excellence in the service to our nation and our allies through leadership and combat developments.

TONEY STRICKLIN
Major General, USA
Commanding

# PREFACE

The 1999 Annual Command History for the U.S. Army Field Artillery Center and Fort Sill follows the decision-making process as closely as possible. Through messages, staff reports, fact sheets, correspondence, briefings, and other documentation, the Command Historian's Office has recreated as closely as possible how the Center and Training Command made key decisions concerning training, leader development, doctrine, force design, equipment requirements, and mission support.

Because the Center and Training Command were involved in many diverse activities during the year, the Command Historian's Office under the direction of the Commanding General selected only those activities deemed to be the most historically significant to include in the History.

Preserving historical documents forms a vital part of the historian's work. After they are collected from the various Center and Training Command organizations during the process of researching, they are filed in the records and documents collection in the Command Historian's Office. All documents are available for use by Center and Training Command staff, other U.S. governmental agencies, and private individuals upon request.

Because new documents are often found after research and writing are completed, this contemporary history is subject to revision. As new documents are discovered, interpretations and conclusions will change. Comments and suggested changes should be directed to the Command Historian's Office.

In the process of researching and writing the History, the historian becomes indebted to many people for their advice and assistance. The Command Historian's Office would like to thank the people who provided their technical expertise. Without their help writing the history would have been far more difficult.

BOYD L. DASTRUP, Ph.D.
Command Historian
U.S. Army Field Artillery Center
and School

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## MISSION

Influenced by new field artillery technology introduced after the Spanish-American War of 1898, the development of indirect fire, and inadequately trained Field Artillerymen, the War Department opened the School of Fire for Field Artillery at Fort Sill, Oklahoma, in 1911. War Department General Orders No. 72, dated 3 June 1911, directed the school to furnish practical and theoretical field artillery training to lieutenants, captains, field grade officers, militia officers, and noncommissioned officers.[1]

Composed of the U.S. Army Field Artillery School (USAFAS), the U.S. Army Field Artillery Training Center (USAFATC), and the Noncommissioned Officers Academy (NCOA), Fort Sill's Training Command continued the tradition established by the School of Fire at the beginning of the century. In 1999 Training Command used resident and nonresident courses to train Army and Marine Corps officers and enlisted personnel in the tactics, techniques, and procedures to employ fire support systems. Training Command also developed and refined doctrine, designed units for fighting on future battlefields, and participated in the development the Army Experimentation Campaign Plan and the Transformation of the Army that was a major project during the year to make the Army more strategically deployable.[2]

## ORGANIZATION

**New Commanding General**

On 11 August 1999 Major General Toney Stricklin replaced Major General Leo J. Baxter, who retired, as the Commanding General of the U.S. Army Field Artillery Center and Fort Sill. Upon completion of officer candidate school in May 1970, General Stricklin was commissioned a second lieutenant in the Field Artillery. Over the course of his career, he served in

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[1]War Department, General Order No. 72, 3 Jun 1911, Doc I-1, 1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH); Wilbur S. Nye Carbine and Lance: The Story of Old Fort Sill (Norman, OK: University of Oklahoma Press, reprinted 1974), pp. 320-29.

[2]1993 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 1-2; "Silhouettes of Steel," Field Artillery, Nov-Dec 99, p. 32, Doc I-1; MG Toney Stricklin, "World Fires for the 21st Century," Field Artillery, Jan-Feb 00, p. 1, Doc I-2.

a variety of command and staff assignments. He earned a masters of arts degree in international relations and a bachelors of science degree in business administration from Cameron University, Lawton, Oklahoma.

General Stricklin was initially assigned to the 23th Infantry Division in Vietnam as a forward observer, as a fire direction officer, and as the Executive Officer of Battery A, 3rd Battalion, 16th Field Artillery. General Stricklin graduated from the Field Artillery Officer Advance Course in June 1975. Following an assignment to Korea as the Commander of Battery A, 1st Battalion, 42nd Field Artillery, he was assigned to the 9th U.S. Army Missile Group and 214th Field Artillery Brigade at Fort Sill, Oklahoma. In 1980 General Stricklin was assigned to the 1st Armored Division Artillery, Federal Republic of Germany. He served eighteen months as the Chief of the Division Nuclear Surety Team and eighteen months as S-3 (Operations Officer), 6th Battalion, 14th Field Artillery. After graduating from the Naval Command and Staff College in Newport, Rhode Island, in 1984, General Stricklin was assigned to the Army staff. For three years he served as a staff officer in the Office of the Assistant Deputy Chief of Staff for Operations and Plans, Force Development. General Stricklin has also served as Division Artillery S-3, 1st Cavalry Division, and Commander, 3rd Battalion, 3rd Field Artillery, 2nd Armored Division, Fort Hood, Texas. In 1991 he graduated from the National War College and was assigned to the National Training Center, Fort Irwin, California, as the Senior Fire Support Combat Trainer. He commanded the 210th Field Artillery Brigade, Fort Lewis, Washington, from 1992 to 1994. Following brigade command, he became Director of Combat Developments, U.S. Army Field Artillery School, Fort Sill, Oklahoma, and subsequently served as the Executive Officer for the Deputy Commanding General, U.S. Army Training and Doctrine Command, Fort Monroe, Virginia. In 1995 General Stricklin was assigned to the Joint Staff as Division Chief, Conventional Arms Control Division, J-5, and then as the Assistant Deputy Chief of Staff for Combat Developments, U.S. Army Training and Doctrine Command. In June 1997 General Stricklin became the Deputy Commanding General for Training, U.S. Army Field Artillery Center and Fort Sill. Since May 1998 General Stricklin served as the Director of Requirements, Office of the Deputy Chief of Staff for Operations and Plans.

General Stricklin's received the following decorations: the Defense Superior Service Medal, the Legion of Merit (3rd Oak Leaf Cluster), the Bronze Star Medal, the Defense Meritorious Service Medal, and the Meritorious Service Medal (3rd Oak Leaf Cluster). He is Ranger, Airborne, and

Pathfinder qualified.[3]

**New Deputy Commanding General for Training**

On 5 October 1999 Brigadier General William F. Engel succeeded Brigadier General Lawrence R. Adair, who had left for a position at the Pentagon in August 1999, as the Deputy Commanding General for Training at the U.S. Army Field Artillery Center and Fort Sill. General Engel was commissioned a second lieutenant in the Field Artillery through Army Reserve Officer Training Corps (ROTC) at Virginia Polytechnic Institute and began his career as a Platoon Leader, C Battery, 3rd Battalion (Target Acquisition), 26th Field Artillery at Fort Sill, Oklahoma. He next served as the Executive Officer of C Battery and later assistant S-3 (Operations) for 2nd Battalion, 1st Field Artillery at Fort Sill.

Upon departing Fort Sill, General Engel went to Italy where he served as the Executive Officer, B Battery, 2nd Battalion, 30th Field Artillery and S-2 (Intelligence) and later S-1 (Administration) for the 2nd Battalion, 30th Field Artillery. Prior to departing from Italy, he commanded the 12th Field Artillery Detachment, 559th Field Artillery Group. General Engel returned to Fort Sill in 1977 and attended the Field Artillery Officer Advance Course. Afterwards, he became the Assistant Professor of Military Science at Central State University, Edmond, Oklahoma. In 1981 General Engel assumed duties as the Assistant Fire Support Coordinator and later G-3 Plans/Force Development Officer for the 2nd Infantry Division Artillery in Korea.

After Korea General Engel attended the Foreign Area Officer Course and Spanish language training at Fort Bragg, North Carolina. He was then assigned to the United States Army School of the Americas where he served as the Chief, Weapons Division, Operations Officer, and Assistant Deputy Commandant for the school in Panama. After attending the first U.S. Army School of the Americas Command and General Staff College course at Fort Benning, Georgia, in 1985, General Engel was assigned as the S-3 (Operations) Officer and later Executive Officer, 2nd Battalion, 10th Field Artillery, 197th Infantry Brigade; Chief, Logistics Division, U.S. Army

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[3] Official Change of Command and Retirement Ceremony, 11 August 1999, Doc I-3.

School of the Americas; and Commander, 4th Battalion, 41st Field Artillery, 197th Infantry Brigade (Mechanized), which deployed into the Persian Gulf during Operations Desert Shield/Storm.

In 1992 after completing the Inter-American Defense College at Fort McNair, Washington, D.C., General Engel served as the Chief, Surety and Management Division and later as Chief, Nuclear Division, Office of the Deputy Chief of Staff for Operations and Plans, U.S. Army, Washington, D.C.

In 1993 General Engel returned to Fort Sill where he served as the Chief, Systems Integration and Programs Division and later the Commander, 17th Field Artillery Brigade, III Armored Corps Artillery. In 1996 he departed Fort Sill to serve as the Chief, Command Planning Group, U.S. Army Training and Doctrine Command, Fort Monroe, Virginia. In July 1998 General Engel assumed the position of the Deputy Director of Operations, National Military Command Center, J-3, The Joint Staff, Washington, D.C.

General Engel's earned the Legion of Merit (two Oak Leaf Clusters), the Bronze Star, the Meritorious Service Medal (three Oak Leaf Clusters), the Army Commendation Medal (two Oak Leaf Clusters), the Army Achievement Medal, and the Army Staff Identification Badge.[4]

## MISSION SUPPORT

### The Budget

During 1999 Fort Sill prepared for the Fiscal Year (FY) 2000 budget and simultaneously executed FY 1999 budget actions. Acknowledging that FY 1998 had been challenging for manpower and resources issues that had attended the budget reductions, the U.S. Army Training and Doctrine Command (TRADOC) and Fort Sill recognized that 1999 had the potential of being "calmer."[5] Unwilling to base planning for the coming fiscal year on such an assumption, however, the Commanding General of TRADOC, General John N. Abrams, and his staff issued guidance early in 1999 to ensure adequate preparations for FY 2000. In March 1999 General Abrams explained in a memorandum to his installation commanders, "Army Readiness is directly linked to TRADOC's missions, and our ability to train soldiers today while developing doctrine, materiel, and organization to meet tomorrow's land combat challenges."[6]

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[4]Biography, 7 Jan 00, Doc I-4; "Memories, Experiences Will Help AC Direct FA School, Field Artillery Future," Fort Sill Cannoneer, 29 Oct 99, p. 1a, Doc I-5.

[5]Email msg with atch, subj: FY00/01 MPR Program Update, 23 Dec 98, Doc I-6.

[6]Memorandum for Commanders, TRADOC Installations, subj: TRADOC Resource and Funding Theme, 29 Mar 99, Doc I-7.

Without the capability to access and train new soldiers, to sustain and revitalize the Army's professional military education system, to maintain TRADOC's power projection platforms, and to develop future fighting capabilities and doctrine, the Army lacked the ability to meet its objectives, and this directly involved TRADOC's mission. As General Abrams further noted, TRADOC had to have adequate resources to meet its mission, but it lacked sufficient resources in 1998-1999 "to accomplish many critical tasks."[7]

[7]Ibid.

Subsequent to General Abram's guiding philosophy about the importance of his command, TRADOC issued budget guidance for FY 2000 and explained that it represented a fundamental change in methodology from past years. Forming the heart of TRADOC's guidance, the Command Program Management System with its three sub-components (TRADOC command plan, installation contracts, and review and analysis) were new, according to TRADOC. At a commander's conference in May 1999, TRADOC explained the essence of the Command Program Management System. The command plan articulated the command's mission, vision, and priorities and defined clear goals and objectives, while installation contracts signed by the installation commander and the TRADOC commander would foster a clear understanding between TRADOC and the installation about the latter's ability to complete the mission given the resources. Last, review and analysis would involve conducting periodic reviews to determine the progress towards achieving the goals and the objectives. Based upon guidance from TRADOC, Fort Sill had to develop its own command plan for FY 2000 that was consistent with TRADOC's command plan and had to meet TRADOC's three major priorities of being committed to the Army's near-term readiness, sustaining TRADOC's readiness capability to perform its mission, and preparing the Army for the future. Fort Sill also had to sign an installation contract with TRADOC and be subject to review and analysis of its plan and progress.[8]

[8]Memorandum for See Distribution, subj: FY00 TRADOC Budget Guidance, undated, Doc I-8; Briefing, subj: TRADOC Commanders Conference, 4 May 99, Doc I-8A.

After hard work Fort Sill issued its command plan for FY 2000 in June 1999 that outlined its mission, vision, and priorities. In succinct language Fort Sill explained that its mission involved sustaining current and future force readiness by training the Field Artillery as an essential element of the joint and combined arms team, by developing cutting edge fire support doctrine, training methods, and equipment, and by sustaining the readiness and power projection capabilities of tenant and mobilizing forces. A second part of the mission centered on maintaining an excellent community quality of life, while its vision focused on sustaining a world-class installation that was centered on the future of fire support. Fort Sill established training the student load to standard; providing quality Field Artillery soldiers, Marines, leaders, maintaining readiness; generating requirements for future systems; developing coherent future doctrine and training products; sustaining the installation to support long-term mobilization missions; maintaining an excellent quality of life; telling the Army story; and meeting all standards for fiscal and environmental accountability as its priorities.[9]

Not even Fort Sill's command plan had the ability to deflect the fiscal realities projected for FY 2000 because the installation faced another budget cut. In the commander's statement to the FY 2000 command operating budget sent to TRADOC in July 1999, Commanding General, Major General Leo J. Baxter, wrote:

> The FY00 resources continue the downward decline and will be a formidable challenge. We will continue to train the load; however, the flexibility to support increased training loads without resourcing has been eliminated, and reductions compound problems in maintaining the infrastructure, and meeting rising utility costs. Although we have identified and implemented efficiencies to posture Fort Sill to meet these reductions, the larger than expected cuts in FY00 significantly impacts our ability to perform our mission within the organizational structure and budget that remains.[10]

General Baxter touched upon a cruel reality. Although the installation was committed to fulfilling its mission of training and ensuring that fire support met the Army's needs, the forecasted budget reduction for FY 2000 created problems

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[9]USAFACFS Mission, Vision, and Installation Priorities, Jun 99, p. 2, Doc I-9.

[10]Memorandum for Cdr, TRADOC, subj: Commander's Statement — FY00 Command Operating Budget, 19 Jul 99, Doc I-10.

and had the potential of seriously eroding the ability to furnish quality training and fire support developments.[11]

Fort Sill's installation contract with the Commanding General of TRADOC constituted a firm agreement and understanding between General Abrams and the new Commanding General of Fort Sill, Major General Toney Stricklin, about Fort Sill's resource priorities, workload to be accomplished, and the realities of the budget situation facing the installation in FY 2000. As the contract explained, Fort Sill would not be able to execute certain missions given the resources.[12]

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[11] Ibid.

[12] Command Operating Budget, 19 Jun 99, pp. 23-55, Doc I-11; Briefing, subj: FY00 Resource Contract, USAFACFS, 15 Sep 99, Doc I-12; FY00 Resource Contract, undated, Doc I-13; Fort Sill Cannot Do's, undated, Doc I-14.

In the meantime, Fort Sill had to execute the FY 1999 budget. Early in 1998, the installation planned to have an operating budget of $96 million for FY 1999, which was well below the actual congressional appropriations for FY 1998 of $112 million. In view of this situation, General Baxter directed functional and budget reviews of all TRADOC operations to posture the installation for the congressional-mandated reductions planned for FY 1999 and beyond. To meet the planned resource decreases for FY 1999 and FY 2000, the 1999 Vision Plan outlined consolidations, reorganizations, and decrements. As TRADOC noted in September 1998, budget projections for FY 1999 closely matched the appropriations bill being considered by Congress. Several months later in January 1999, the shocking news arrived. Congress and the Department of the Army cut TRADOC's budget an additional $103 million. Rather than passing this reduction onto its subordinate commands, TRADOC absorbed it at the headquarters and even passed on an actual increase. As it turned out, Fort Sill's budget for FY 1999 stood at $106 million, which was more than the envisioned $96 million. Yet, it was still a significant reduction from $112 million in FY 1998.[13] With the

[13]Briefing, subj: FY99 Vision Budget, CG Approved Plan, 1998, Doc I-15; Memorandum for See Distribution, subj: FY99 Budget Vision Decrements, 9 Apr 98, Doc I-16; Memorandum for See Distribution, subj: FY 99 Funding Outlook and TRADOC Budget Guidance Response, 10 Sep 98, Doc I-17; Memorandum for Distribution, subj: FY99 Appropriation TRADOC Budget Guidance, 7 Jan 99, Doc I-18; Memorandum for See Distribution, subj: FY 99 Appropriation TRADOC Budget Guidance, 21 Dec 98, Doc I-19; Briefing, subj: FY99 Appropriations TRADOC Budget Guidance, Jan 99, Doc I-20; Email msg with atch, subj: Budget Narrative for Annual History, 28 Feb 00, Doc I-21.

advanced planning under the 1999 Vision Plan, Fort Sill was prepared for the reduction and was even able to repair some of the most critical infrastructure problems.[14]

[14] Ibid.

Although Fort Sill received more funding in FY 1999 than initially planned, it still faced major funding challenges. During the year, Fort Sill acquired new missions, such as the Red Cross Regional Office that opened in July 1999 and Gender Integrated Training that began in May 1999 at the U.S. Army Field Artillery Training Center. Also, training projections in the Field Artillery Training Center, the Field Artillery School, and the Noncommissioned Officer Academy for the remaining months of the fiscal year were higher than originally calculated. Fort Sill did not have sufficient funding to train the additional student loads to standard. In view of this, the installation feared compromising training standards because of budget reductions.[15]

Even before the added missions hit the installation, General Baxter wrote TRADOC in February 1999 about the budget situation in general. He commented, "We have a formidable task to accomplish our mission within the organizational structure and budget that remains [in FY 1999]. We are training loads on the margin and flexibility for increased training loads has been eliminated. In addition, the erosion of the base infrastructure continues."[16] The General then pointed out with clarity:

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[15]Briefing, subj: FY 99 Appropriation TRADOC Budget Guidance, Jan 99; Briefing, subj: FY99 Budget Execution, 31 Mar 99, Doc I-22; Briefing, subj: FY 99 Budget Execution Mid-Year Review, 27 Apr 99, Doc I-23; Briefing, subj: FY 99 Budget Execution, 30 Jun 99, Doc I-24; Email msg with atch, subj: Budget Narrative for Annual History, 28 Feb 00.

[16]Memorandum for Cdr, TRADOC, subj: Commander's Statement — FY 99 Appropriation TRADOC Budget Guidance, 10 Feb 99, Doc I-25.

> The most disastrous state exists in our real property and its supporting infrastructure. . . . With average age of infrastructure over 50 years, many building systems are wearing out. Buildings, which are only 15 years old, normally have HVAC [heating, ventilation, and air conditioning] and plumbing problems that we "band-aid repair."[17]

Although he noted the imposing challenge of maintaining facilities and furnishing quality training in 1999, General Baxter wrote that Fort Sill would do its best to maximize its resources but that funding would force the installation to perform its mission "on the margin."[18]

**Base Realignment and Closure 1995 and Fort Chaffee, Arkansas**

[17] Ibid.

[18] Ibid.

Although Base Realignment and Closure (BRAC) was new to Fort Sill in the mid-1990s, the process had its origins in the 1960s. Understanding that the Department of Defense (DOD) had to reduce its base structure that had been created during World War II and the Korean War, President John F. Kennedy directed Secretary of Defense Robert S. McNamara to develop and implement an extensive base realignment and closure program to adjust to the realities of the 1960s. The Office of the Secretary of Defense (OSD) subsequently established the criteria to govern the selection of bases without consulting Congress or the military. Under McNamara's guidance DOD closed sixty bases early in the 1960s without Congress or other government agencies participating. In view of the political and economic ramifications of the closures, Congress decided that it had to be involved in the process and passed legislation in 1965 that required DOD to report any base closure programs to it. However, President Lyndon B. Johnson vetoed the bill. This permitted DOD to continue realigning and closing bases without congressional oversight throughout the rest of the 1960s.[19]

Economic and political pressures eventually forced Congress to intervene in the process of realigning and closing bases and to end DOD's independence on the matter. On 1 August 1977 President Jimmy Carter approved Public Law 95-82. It required DOD to notify Congress when a base was a candidate for reduction or closure; to prepare studies on the strategic, environmental, and local economic consequences of such action; and to wait sixty days for a congressional response. Codified as Section 2687, Title 10, United States Code, the legislation along with the requirements of the National Environmental Policy Act (NEPA) permitted Congress to thwart any DOD proposals to initiate base realignment and closure studies unilaterally by refusing to approve them and gave it an integral role in the process.[20]

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[19]1995 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 17-18.

[20]Ibid., p. 18.

As economic pressures mounted, the drive to realign and close military installations intensified. In 1983 the President's Private Sector Survey on Cost Control (the Grace Commission) concluded in its report that economies could be made in base structure and simultaneously recommended the creation of a nonpartisan, independent commission to study base realignment and closure. Although nothing came of this recommendation, the defense budget that had been declining since 1985 and that was predicted to continue to decrease in coming years prompted the Secretary of Defense to take decisive action. In 1988 the Secretary of Defense recognized the requirement to close excess bases to save money. In view of this, the Secretary of Defense chartered the Commission on Base Realignment and Closure in 1988 to recommend military bases within the United States for realignment and closure.[21]

In the meantime, Congress passed Public Law 100-526. It provided the statutory basis for a one-time base realignment and closure and furnished partial relief from certain statutory impediments. Public Law 100-526 waived a portion of NEPA requirements, delegated property disposal authority to DOD, and expedited congressional review of BRAC recommendations. Passage of this law constituted a recognition that realigning and closing bases could save money without harming national security and that Congress would support such measures.[22]

The BRAC commission of 1988 issued its report in December 1988. It proposed closing eighty-six military installations and realigning thirteen others. In addition, the commission designated forty-six installations for increases in mission because units and activities would be relocated to them as a result of the closures and realignments. Approved by the Secretary of Defense and Congress, the commission's recommendations led to the realignment and closure of fourteen major installations by February 1995 with other two to be realigned or closed by 2000, while seventy-seven of the eighty-six bases were closed by mid-1998 with the remaining to be closed early in the twenty-first century.[23]

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[21]Ibid., pp. 18-19.

[22]Ibid., p. 19.

[23]Ibid., pp. 19-20; Information Paper, subj: Army BRAC

Status, 13 May 98, Doc I-42, 1998 USAFACFS ACH.

The waning of the Cold War early in the 1990s reduced international tensions and the threat of war and concurrently led DOD to conclude that its budget would continue to decline even more precipitously, and this further magnified the need for realigning and closing bases. Because the base closure and environmental impact studies required under Section 2687 would take one to two years to complete, DOD developed a list of candidates for closure and realignment in January 1990. Before any real action on the studies could begin, Congress passed legislation in November 1990, and the President signed it as Public Law 101-510. The law required DOD to review its base structure without regard to the January 1990 list. Working from the BRAC experience of 1988, the new law authorized independent Presidential BRAC commissions in 1991, 1993, and 1995 to review the Secretary of Defense's recommendations for base realignment and closure in those years. Through the end of 1995, the BRAC commissions, including the 1988 one, closed ninety-eight bases in the United States and over six hundred overseas bases and produced an annual savings of almost $1 billion. By 1999 the Army completed the closures and realignments authorized under the first three BRACs and anticipated meeting the closures and realignments outlined by the 1995 BRAC by 2001.[24]

Outside of moving the Joint Readiness Training Center (JRTC) from Fort Chaffee, Arkansas, to Fort Polk, Louisiana, as a result of the BRAC of 1991, the BRAC process had little influence upon Fort Sill over the years. The BRAC of 1995, however, made a significant impact. In July 1995 the BRAC commission advised closing Fort Chaffee, Arkansas, a sub-installation of Fort Sill, Oklahoma, as an active component (AC) facility. President William J. Clinton approved the 1995 BRAC recommendations on 15 July 1995, and they became Public Law 101-510 on 28 September 1995. Based upon the law, the Commanding General of Fort Sill had to close Fort Chaffee except for the minimum essential ranges, facilities, and training areas required for a reserve component (RC) training enclave for individual and annual training and had to dispose of excess properties to the private sector. This involved creating a RC training enclave that would license the Arkansas Army National Guard (ARARNG) to operate it with U.S. Army Reserve (USAR) activities being tenants and realigning current tenants from Fort Chaffee. Fort Sill also had to transfer Fort Chaffee area support responsibilities to Fort Sill, establish an Arkansas Army National Guard garrison at Fort Chaffee, and cancel the installation's designation as a U.S.

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[24]1995 USAFACFS ACH, p. 20; U.S. Army Posture Statement Fiscal Year 1999, p. 64, Doc I-42A, 1998 USAFACFS ACH; U.S. Army Posture Statement Fiscal Year 2001 (Extract), Feb 00, pp. 37-38, Doc I-25A.

Army Forces Command (FORSCOM) mobilization station and contingency mission site. In addition, Fort Sill had to ensure that the property would be declared excess and would be turned over to the private sector environmentally clean.[25]

[25]1995 USAFACFS ACH, pp. 20-21; 1996 USAFACFS ACH, p. 16.

In September 1996 Fort Sill published a plan to execute the public law and to assure an orderly closure of Fort Chaffee. According to Public Law 101-510, Fort Chaffee would be closed as an AC military installation effective 30 September 1997 with the mission for maintaining the RC enclave passing to the Arkansas Army National Guard on 1 October 1997. Subsequent to that date, a federal government transition team would coordinate the disposal of all remaining excess equipment, material, and real property in coordination with the United States Property and Fiscal Office. A completion date of Fiscal Year (FY) 2001 for the disposal was established.[26]

Fort Sill's closure plan, which was a working document subject to revisions as needed, envisioned a three-phase approach to the transfer. During phase one (the planning phase), plans for the drawdown would be written. This involved writing a detailed plan of RC enclave and Fort Chaffee residual dimensions, ownership, and base operations support; producing a comprehensive plan for administering annual training for 1997; and transferring annual training for 1998 to the RC. In phase two (the transition phase) the transfer from an active Army installation to the Arkansas Army National Guard operated enclave would transpire. Tenant activities could move, if necessary, to new facilities or locations. The designation of Fort Chaffee as a U.S. Army Forces Command (FORSCOM) mobilization station and contingency mission site would be canceled, while administration of 1997 annual training funding would be continued by Fort Sill/Fort Chaffee. At the same time U.S. Army Garrison (USAG) support activities would turn in equipment, close buildings, prepare real property for turn in, and reduce support functions. The U.S. Army Garrison, however, would continue post support through FY 1997.[27]

Phase three (the caretaker phase) would last from 1 October 1997 to disposal in FY 2001. During those years, a Fort Sill transition team of sixty personnel, which would be reduced to forty personnel in the final year, would prepare Fort Chaffee's excess property for final closure, perform real property maintenance in the excess area as required, dispose

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[26]Ibid., pp. 16-17.

[27]Ibid., p. 17.

of personal property, and secure government property until properly disposed. Base operations support would be assumed by the Arkansas Army National Guard for the RC enclave. Upon the completion of all required environmental cleanup of the excess property and the transfers, the third phase would conclude. The separation of the transition team would mark the end of U.S. Army Garrison presence on Fort Chaffee.[28]

[28] Ibid., p. 18.

On 27 September 1997 a change of command ceremony closed an era at Fort Chaffee. That day, official command and control of the installation passed from the U.S. Army to the Arkansas Army National Guard when the U.S. Army Garrison was inactivated. The installation became officially known as the Fort Chaffee Maneuver Training Center.[29]

Nevertheless, Fort Sill still had vital role in Fort Chaffee operations after 1 October 1997, the official transition date. During the final phase, Fort Sill centered its attention on transferring excess, nonessential property from the U.S. Army to the Local Redevelopment Authority, a group of local community leaders. Specifically, Fort Sill's Directorate of Environmental Quality (DEQ) provided oversight to the base transition team, which had the responsibility of transferring the excess property and ensuring that environmental cleanup was properly conducted. In the meantime, the Directorate of Logistics (DOL) assisted the base transition team on logistical actions, such as property book support, while the Directorate of Contracting (DOC) furnished contracting assistance. Other Fort Sill agencies, such as the Directorate of Plans, Training, and Mobilization (DPTM), the Directorate of Public Works (DPW), and the Staff Judge Advocate (SJA), supplied assistance in their areas of expertise. Perhaps, the most important Fort Sill involvement centered on writing a new disposal plan to transfer excess property to the Local Redevelopment Authority.[30]

Besides completing the disposal plan and the transfer documents on over seven hundred buildings and structures and sixty-five thousand acres to the Arkansas Army National Guard, Fort Sill continued assisting the realignment process during 1998. For example, DOL closed its transportation office, assisted in the development of caretaker table of distribution and allowance for equipment, and helped screen excess personal property. DEQ maintained oversight of the environmental clean up process and advised the commander of Fort Sill on all environmental issues, while DRM closed outstanding budget accounts and provided training to Fort Sill staff members on

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[29]1997 USAFACFS ACH, p. 10.

[30]Ibid.

the BRAC process, among other things. Meanwhile, DCP expedited the staffing needs of the transition team, furnished placement services for Department of the Army civilians, and personnel services for the transition team.[31]

[31]Memorandum for Command Historian, subj: USAFACFS Annual Command History for CY 1998, 9 Feb 99, Doc I-43, 1998 USAFACFS ACH.

During 1999, Fort Sill remained involved with the Fort Chaffee Maneuver Training Center. Although it was reduced by eighteen people, the Base Transition Team focused on property transfer to the Fort Chaffee Public Trust. The team assisted in the preparation of the Economic Development Conveyance application for the Fort Chaffee Public Trust, while the Fort Sill garrison provided assistance with several ongoing projects, such as environmental site remediation, coordinating daily facility use, and processing Base Disposal Support Packages, to name a few.[32]

**Circular A-76 Studies and Contracting Out**

Examining governmental activities to determine whether they should be contracted out or not had their origins in the 1950s. Early in 1955, the Bureau of the Budget, the forerunner of the Office of Management and Budget (OMB), formulated the policy of increasing reliance on the private sector for certain goods and services. It explained at the same time that exceptions existed. Governmental agencies could be used if their functions were considered to be inherently governmental in nature, if satisfactory commercial sources were unavailable, if national defense were at stake, or if a cost-comparison study revealed that the government could furnish the service less expensively than private enterprise could. Although the 1955 pronouncement and subsequent ones focused more attention on studying commercial activities than previously, the government turned over only a few functions to private enterprise. Through 1963 the government depended upon its installations and their staffs rather than private companies, especially when commercial activities were more costly. As such, cost had become the deciding factor during the years after 1955.[33]

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[32] Memorandum for Command Historian, subj: USAFACFS Annual Command History for CY 1999, 20 Jan 00, Doc I-26.

[33] 1990 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 11-12.

Influenced by the drive for cost efficiency, the Bureau of the Budget issued Circular A-76 in 1966. This circular and revisions of 1967, 1979, 1983, and 1996 directed the government to solicit proposals to compare in-house and contractor costs and outlined the proper procedures for seeking offers from contractors. Equally important, A-76 reaffirmed that the government desired to rely upon private business for goods and services, that some functions had to be performed by the government because they were governmental in nature, and that relative costs would determine whether a function would be done by government employees or commercial sources. Although the performance of the tasks might be transferred from the government to a commercial source if it proved to be less expensive, the Army still retained ownership of the activity.[34]

In keeping with the drive over the years to be more cost efficient, in 1998 the Department of the Army directed that commercial activities cost competition studies be conducted to determine the more efficient provider with the goal of reviewing forty-eight thousand civilian and eight thousand military positions for Fiscal Year (FY) 1999 through FY 2003. In compliance with the Army's directive, the U.S. Army Training and Doctrine Command (TRADOC) announced in November 1998 that command-wide A-76 studies of the Directorates of Information Management (DOIM) and Training Services Centers (TSC) would begin in FY 1999. Subsequently in December 1998, TRADOC said that Adjutant General/Military Personnel Offices (AG/MPO) would also undergo A-76 studies beginning FY 1999. The results of the DOIM, TSC, and AG/MPO studies and the ongoing study of the Directorate of Public Works (DPW) that had begun in May 1997 at Fort Sill and that was being done by a contractor, Management Analysis, Inc., would determine the most cost-effective way of doing those jobs by permitting government and private enterprise to put their most cost-efficient proposals and organizations forward for consideration.[35]

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[34] 1989 USAFACFS Annual Historical Review, p. 14; Memorandum for Command Historian with Encls, subj: USAFACFS Annual Command History for CY 1998, 9 Feb 99, Doc I-44, 1998 USAFACFS ACH; Memorandum for Command Historian, subj: Coordination of 1999 USAFACFS Annual Command History, 31 Mar 00, Doc I-26A.

[35] "DOIM, TSC to undergo Cost Competition Study," Fort Sill Cannoneer, 3 Dec 98, pp. 1a, 5b, Doc I-45, 1998 USAFACFS ACH; "AG Next Target for Cost-Competition Study," Fort Sill Cannoneer, 10 Dec 98, p. 6a, Doc I-46, 1998 USAFACFS ACH; "Base Ops Studied at TRADOC Posts," Fort Sill Cannoneer, 3 Apr 97, pp. 1a, 2a, Doc I-47, 1998 USAFACFS ACH; Msg with Atch (Extract), subj: CY 98 Command History,

21 Jan 99, Doc I-48, 1998 USAFACFS ACH; Memorandum for Command Historian with Atch (Extract), subj: Annual Command History, 13 Jan 98, Doc I-49, 1998 USAFACFS ACH; Memorandum for Command Historian with Encls, subj: USAFACFS Annual Command History for CY 1998, 9 Feb 99.

Unlike in the past when installation Directorate of Resource Management (DRM) carried out the studies without outside assistance, TRADOC decided to hire contractors to help conduct the studies. TRADOC selected this alternative because the studies were command-wide and not limited to a certain post and because local DRMs had been reduced in size in response to budget cuts of recent years. Notwithstanding this fundamental change, the study concept remained constant with those of past years. Fort Sill would develop its most efficient DOIM, TSC, DPW, and AG/MPO organizations to compete with a potential contractor. The more cost-effective bid would then perform the function. Even though Fort Sill would receive contractor support on the studies, it would have to take a full and active part in the commercial activities study process, would have to take ownership of the outcome, and would have to live with the results of the studies. In view of this, Fort Sill established three installation study teams in FY 1999 to work with each of the command-wide contractors in order to coordinate, review, and change, as appropriate, study documents completed by the contractor.[36]

During 1999, the Directorate of Resource Management continued working on contracting out. It placed a notice of intent to solicit contractor bids for DPW on Fort Sill's Internet website in November 1999 and planned to complete the study in 2001. In the meantime, TRADOC received funding for command-wide studies of the AG/MPO, DOIM, and TSC functions with start dates in FY 2000.[37]

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[36]"AG Next Target for Cost-Competition Study," p. 6a; "DOIM, TSC to undergo Cost Competition Study," pp. 1a, 5b; Memorandum for Command Historian with Encls, subj: USAFACFS Annual Command History for CY 1998, 9 Feb 99; Interview, Dastrup with Wynona Morris, DRM, 7 Jan 00, Doc I-27; Email msg with atch, subj: A76 Studies, 22 Feb 00, Doc I-28.

[37]Interview, Dastrup with Morris, 7 Jan 00; Email msg

**Fort Sill and Power Projection**

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with atch, subj: A76 Studies and Contracting Out, 9 Feb 00, Doc I-29; Memorandum for Command Historian, subj: Coordination of 1999 USAFACFS Annual Command History, 31 Mar 00.

The unexpected end of the Cold War at the beginning of the 1990s caused the United States to restructure its national military strategy. Rather than depending upon forward deployed military forces in Europe as it had done for over forty years, the new strategy focused on deploying military forces from the continental United States (CONUS). Equally important, the new military strategy embraced the principles of deterrence, forward presence, crisis response, and reconstitution and required Army installations, such as Fort Sill, Oklahoma, to have the ability of responding rapidly to regional crises throughout the world. To help Fort Sill fulfill its force projection requirements Congress approved an Army Strategic Mobility Program railhead in 1998 and funded it in the Fiscal Year (FY) 2000 budget. As explained in 1998 and 1999, besides upgrading fifteen installations, fourteen airfields, seventeen strategic seaports, and eleven ammunition depots and plants throughout the United States, the Army Strategic Mobility Program would upgrade Fort Sill's railway system and provide an improved capability to move the heavy field artillery pieces of the III Armored Corps Artillery to their deployment ports and to help the installation serve as a springboard for the rapid deployment of Army forces throughout the world.[38]

As in past years, Fort Sill, in the meantime, participated in deploying and redeploying units and individual soldiers in support of the national military strategy in 1999. During the year, Fort Sill supported Operation Joint Guard in Croatia, Bosnia, Herzegovina, and Montenegro. Stabilization Force 5, 6, and 7 provided soldiers for the 5th, 6th, and 7th rotations for Operation Joint Guard. Operation Noble Anvil, the United Nations bombing of Serbia, was also supported by deploying Task Force Hawk. After a sixty-eight day tour of duty in Tirana, Albania, soldiers of the 2nd Platoon, A Battery (Multiple-Launch Rocket System), 18th Field Artillery, and 226th Maintenance Company, and one civilian technical

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[38] 1994 USAFACFS ACH, pp. 18-19; Statement Posture of the U.S. Army (Extract), Fiscal Year 2000, Feb 99, p. 25, Doc I-30; Msg, subj: Annual Command History 1998, Power Projection, 1 Mar 99, Doc I-50, 1998 USAFACFS ACH; U.S. Army Posture Statement (Extract), Fiscal Year 1999, pp. 14-15, Doc I-42A, 1998 USAFACFS ACH. Following Desert Storm of 1991, the Department of Defense conducted the Mobility Requirements Study (MRS) and the Army Strategic Mobility Program designed to implement MRS recommendations that the military could increase its deployability through investment in prepositioned materiel, airlift, sealift, and deployment infrastructure, identified and prioritized infrastructure improvements at Key installations and ports. See U.S. Army Posture Statement (Extract), Fiscal Year 1999, p. 14.

advisor from Lockheed-Martin returned to Fort Sill on 7 July 1999. While in Tirana, the platoon had the mission of suppressing enemy air defense fires for deep aviation attacks by Apache helicopters. Because the Air Force picked up the mission, the unit did not fire any rockets. A detachment from the 1st Personnel Support Battalion deployed to Tazar, Hungary, in support of Operation Joint Guard to process soldiers in and out of Bosnia in support of peacekeeping efforts.[39]

[39]Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00, Doc I-31; "Steel Rain Returns," Fort Sill Cannoneer, 15 Jul 99, pp. 1a and 8a, Doc I-32; Memorandum for Command Historian (Extract), subj: Coordination of 1999 Annual Command History, 17 Mar 00, Doc I-32A.

Fort Sill also deployed soldiers to other areas of the world. On 21 December 1999 thirteen III Armored Corps Artillery soldiers returned from Kuwait. Assigned to various units, the soldiers deployed to Kuwait on 28 July 1999 in support of Operation Southern Watch to defend Kuwait from Iraqi aggression. In addition, Fort Sill deployed individual soldiers in support of humanitarian and peacekeeping operations in Central and South America, Haiti, Albania, Hungary, Kuwait, Morocco, Bosnia, Kosovo, and Korea.[40]

**Fort Sill's Radar Approach Control**

Established in 1959, the Army Radar Approach Control (ARAC) at Fort Sill furnished air traffic control for Henry Post Airfield on Fort Sill, the Lawton municipal airport, the Duncan Haliburton Airport, and the other airports in the surrounding area. Through the mid-1980s Henry Post Airfield was also home for a U.S. Army Forces Command helicopter battalion, two helicopter companies, a medical evacuation platoon, and ten to fifteen U.S. Army Field Artillery Center and Fort Sill helicopters and airplanes. However, in the mid-1980s Fort Sill started losing Army aircraft because of budget cuts. Through restationings and inactivations Fort Sill lost most of its aircraft by the mid-1990s. At the end of Fiscal Year (FY) 1996, for example, Fort Sill had only a few fixed-wing aircraft and three temporary duty medical evacuation helicopters at Henry Post Airfield.[41]

In the meantime, non-Army air traffic began to take up

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[40]"Soldiers Return from Kuwait in Time for Holidays," Fort Sill Cannoneer, 6 Jan 2000, pp. 1a and 2a, Doc I-33; Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00; Memorandum for Command Historian (Extract), subj: Coordination of 1999 Annual Command History, 17 Mar 00.

[41]1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 11-12.

most of the Fort Sill ARAC's time. In 1995, for example, the ARAC handled 170,670 air movements. This included approaches and departures at multiple airfields and overflights. Of this total, only twenty-two percent of the flights were Army. Forty-five percent of the flights were Air Force, and thirty-three percent were civilian.[42]

[42]Ibid., p. 12.

In view of the budget cuts of the 1990s, the aging equipment, such as the ASR-8 airport surveillance radar that would cost several million dollars to replace, the reduction in the number of Army aircraft at Fort Sill, and the accompanying decline in Army aviation traffic, the U.S. Army had to consider the rationale for maintaining the ARAC. Late in 1995, the U.S. Army Aeronautical Services Agency (USAASA) reviewed the need for the ARAC and concluded that it should be closed. In January 1996 the USAASA notified the Federal Aviation Administration (FAA) of its intention to return the currently delegated approach control authority to it. The notification stated that U.S. Army would not abruptly cease approach control operations in the Lawton/Fort Sill area that might disrupt commercial or general aviation activities and also recommended the development of a transition plan.[43]

Because Sheppard Air Force Base, Texas, used Henry Post Airfield and Fort Sill's ARAC for Euro-NATO Joint Jet Pilot training, the U.S. Air Force reacted vigorously to the recommendation and pushed for some type of accommodation. After extensive negotiations in 1996-1997, the U.S. Army and U.S. Air Force reached an understanding. According to a memorandum of agreement signed by both services in March 1997, Fort Sill would continue to operate the ARAC until the U.S. Air Force could install a new digital radar with a projected operational date of 2004. After that date Sheppard Air Force Base would assume control of the airspace formerly controlled by the Fort Sill ARAC and would remotely control the new radar. Also, Fort Sill would continue to operate and maintain a precision approach radar at Henry Post Airfield for the foreseeable future. Moreover, the existing level of funding by both services would continue until the U.S. Army relinquished control responsibility to the U.S. Air Force.[44]

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[43]Ibid.

[44]Ibid., p. 13; Memorandum for Command Historian, subj: SME Review of Fort Sill's Radar Approach Control Portion of the 1998 Annual Command History, 23 Feb 99, Doc I-52, 1998 USAFACFS ACH.

Despite this agreement, the large budget reductions projected for FY 1999 at Fort Sill forced the installation to reexamine the ARAC issue later in 1997. Lacking sufficient funding to operate the ARAC facility, Fort Sill leaders discussed the possibility of closing the it.[45]

[45]Ibid.; Interview, Dastrup with Mitch Pinion, Dep Dir, DPTM, 7 Jan 00, Doc I-34.

Although the zero base budget process conducted in 1997 for FY 1998 permitted Fort Sill to continue operations of the ARAC facility, operating the ARAC came at a high cost. According to budget projections developed in 1998 for FY 1999, running the facility would cost $1.7 million. The U.S. Air Force would contribute $536,000 as specified in the memorandum of agreement signed in March 1997. This left Fort Sill to furnish approximately $1.2 million of the ARAC's operations. Because the installation had to pay for ARAC operations at the expense of other critical requirements, Fort Sill again contemplated closing the ARAC in FY 1999 if alternative funding could not be found.[46]

Fort Sill's decision generated a flurry of activities during the rest of 1998. Because the ARAC supported the Lawton Municipal Airport, Lawton city officials and Oklahoma's congressional delegation acted immediately. They asked that the ARAC remain operational until an alternative funding proposal could be arranged with the Department of Transportation and FAA. In fact, Oklahoma's congressional

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[46]Ltr, Ronald E. Morgan, Acting Associate Administrator for Air Traffic Services, FAA, to The Honorable James M. Inhofe, United States Senate, Washington DC, 21 May 98, Doc I-53, 1998 USAFACFS ACH; Msg, subj: ARAC, 30 Nov 98, Doc I-54, 1998 USAFACFS ACH; Interview, Dastrup with Mitch Pinion, Dep Dir, Directorate of Plans, Training, and Mobilization (DPTM), 6 Jan 99, Doc I-55, 1998 USAFACFS ACH; Msg, Mitch Pinion, Dep Dir, DPTM, to Dastrup, subj: Wording of Transportation Bill, 7 Jan 99, Doc I-56, 1998 USAFACFS ACH.

delegation under the leadership of Senator Don Nichols had language interjected into the Transportation Appropriations Bill for FY 1999 that provided funding to continue operations of the Fort Sill ARAC until a staff study by the FAA to determine the most cost effective method of continuing air traffic services could be concluded. In view of this, Fort Sill and the U.S. Army opted late in 1998 to delay the decision of discontinuing ARAC operations.[47]

[47]Interview, Dastrup with Pinion, 6 Jan 99; Msg, subj: ARAC, 30 Nov 98; Fort Sill Public Affairs Office News Release, 12 May 98, Doc I-57, 1998 USAFACFS ACH; Memorandum for Command Historian, subj: SME Review of Fort Sill's Radar Approach Control Portion of the 1998 Annual Command History, 23 Feb 99; Interview, Dastrup with Pinion, 7 Jan 00; Memorandum for Command Historian, subj: Coordination of 1999 Annual Command History, 17 Mar 00, Doc I-34A.

The FAA's failure to complete the study in 1999 as planned led to two agreements between the FAA and the U.S. Army that were signed in March and July 1999 to keep ARAC operating in FY 1999 with FAA funding. The agreements stipulated that the FAA would provide $1.3 million for air traffic services and that Fort Sill would furnish the labor, supervision, material, supplies, and services necessary to operate the ARAC. Subsequently in November 1999, the FAA and the Army signed an interagency agreement that extended the FAA's commitment to provide $1.3 million for FY 2000 for air traffic services and noted that the U.S. Air Force would pay the Army $560,000 to operate the ARAC. Basically, the FAA and the Air Force would pay Fort Sill to run ARAC.[48]

**82nd Medical Evacuation Company Maintenance Contract**

After years of administering a rotary-wing maintenance contract to the 82nd Medical Evacuation (Medevac) Company at Fort Riley, Kansas, which provided medical evacuation services to Fort Sill, the Directorate of Logistics had to revamp the contract in 1999 for several reasons. Although the contractor did good work, the transition from the aging UH-1 helicopter to the UH-60 helicopter at Fort Sill created a problem. The contractor, the RTW Company, lacked the equipment and training to maintain the UH-60 helicopters, and the cost of purchasing new maintenance tools and equipment to support the UH-60

[48]Memorandum of Agreement between FAA and the Department of the Army, 23 Mar 99 and 30 Mar 99, Doc I-35; Modification to Interagency Agreement between FAA and US Army/Fort Sill, 5 Nov 99, Doc I-36; Interview, Dastrup with Pinion, 7 Jan 00; Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00, Doc I-37.

helicopter was too high to make the continuation of the contract feasible. Also, the downsizing of the 1990s with its attending budget cuts reduced Fort Sill's ability to continue administering the contract. Given such circumstances, the Directorate of Logistics decided to terminate the contract effective 1 October 1999 when the new helicopter would be fielded. This caused the 82nd Medevac Company to search for a new contract.[49]

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[49]Interview, Dastrup with Randy C. Palmer, Airfield Operations Officer, Directorate of Plans, Training, and Mobilization (DPTM), 7 Jan 00, Doc I-38; Email msg, subj: 82nd Medevac Company/Fort Sill Maintenance Contract, 9 Sep 99, Doc I-39; Email msg, subj: 82nd Medevac Maintenance Information, 10 Jan 00, Doc I-40; Email msg, subj: 82nd Medevac Company Maintenance Contract, 7 Feb 00, Doc I-41; Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00, Doc I-42.

As the Airfield Operations Officer, Randy C. Palmer explained, the 82nd Medevac Company had three maintenance contract options in 1999. The 82nd Medevac Company could rely solely on a contractor at Fort Riley where it was based to provide the maintenance. It could sign a support agreement with the Oklahoma Army National Guard for the maintenance. The 82nd Medevac Company could provide the maintenance itself, but it lacked the personnel for the option. Knowing that the medical evacuation mission would be jeopardized without a maintenance contract, however, Fort Riley participated in the search for one. After serious discussions Fort Riley obtained a written agreement with the Oklahoma Army National Guard of Lexington, near Oklahoma City, to provide the maintenance service, effective 1 October 1999. At the same time, the Directorate of Logistics entered into a new contract with a new provider for airfield refueling services that were formerly included in the helicopter maintenance contract.[50]

**Project Millennium**

During 1997-1999, the Fort Sill Museum devoted considerable attention on planning and implementing Project Millennium, an initiative of the Commanding General of the U.S. Army Field Artillery Center and Fort Sill, Major General Leo J. Baxter, to capitalize on Fort Sill's vast collection of national historic treasure, rare documents, and culturally significant art work to enhance public education, cultural awareness, scholarly work, and tourism in Southwest Oklahoma. The project included major restorations of historic buildings, such as the cavalry barracks and the guardhouse, which were underway in 1999. The $25 million program also involved constructing a world-class, 100,000 square foot museum complex on Army-owned land adjacent to the National Historic Landmark Area, developing state-of-the-art interpretive and educational exhibits, incorporating a high-technology research center for academic researchers, authors, independent scholars, genealogists, and television and movie producers worldwide.[51]

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[50]Memorandum for Directorate of Contracting, subj: DABT 39-98-C-4018 Aircraft Maintenance, 27 Jul 99, Doc I-43; Interview, Dastrup with Palmer, 7 Jan 00; Email msg, subj: 82nd Medevac Company/Ft Sill Maintenance Contract, 9 Sep 99; Email msg with atch, subj: 82nd Medevac Company Maintenance Contract, 7 Feb 00; Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00; Memorandum for Command Historian, subj: Coordination of 1999 Annual Command History, 17 Mar 00, Doc I-43A.

[51]1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), p. 13; Memorandum for Command Historian (Extract), subj: Annual Historical Review, 11 Feb 99, Doc I-58, 1998 USAFACFS ACH; Memorandum

for Record, subj: Annual Command History Input from Garrison Commander, 19 Jan 99, Doc I-59, 1998 USAFACFS ACH; Interview, Dastrup with Mitch Pinion, Dep Dir, DPTM, 7 Jan 00, Doc I-44; Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00, Doc I-45; Email msg with atch, subj: Project Millennium, 23 Feb 00, Doc I-46.

In 1999 the civilian aide to the Secretary of the Army, Dr. Gilbert C. Gibson, General Baxter, and his successor, Major General Toney Stricklin, reemphasized the potential of the Fort Sill museum as a "National Army Museum of the Southwest" and as a major tourist attraction.[52] In the meantime, State Senator Ron Kirby sponsored legislation in the Oklahoma State Legislature to fund museum construction and to turn the museum over to Fort Sill to operate upon completion. However, at the close of 1999 the funding issue had not been resolved.[53]

**Y2K Preparations**

As with the rest of the world, Fort Sill stood on the brink of a new century in 1999 that had the potential of disrupting critical services and hampering readiness if the installation's computers failed. Many Americans, including some at Fort Sill, feared problems when the date changed from 31 December 1999 to 1 January 2000 and dubbed the conversion the Y2K problem or Millennium Bug, because computers might not process information properly by reading 2000 as 1900 and might cause utilities and other critical services dependent upon them to fail. Along with the Department of the Army (DA) and the U.S. Army Training and Doctrine Command (TRADOC), Fort Sill took steps to minimize disruption caused by computers crashes and to prevent failures. The Department of the Army even directed each installation or garrison commander to review contingency plans for Y2K disruptions with their subordinates to ease the transition from the 1900s to the

[52] Ibid.; Memorandum for Command Historian, subj: Coordination of 1999 Annual Command History, 17 Mar 00, Doc I-46A

[53] Interview, Dastrup with Pinion, 7 Jan 00; Fact Sheet, subj: Army Museum of the Southwest, undated, Doc I-47; Email msg with atch, subj: Project Millennium, 23 Feb 00.

2000s and to coordinate their efforts up the chain of command.[54]

[54]Briefing, subj: Fort Sill and Y2K, 13 Oct 99, Doc I-48; Email msg, subj: Upcoming Items, 8 Sep 99, Doc I-48A; Memorandum for Cdrs, TRADOC Installation, subj: Installation-level Y2K Planning, 15 Oct 99, Doc I-49.

Even before the Department of the Army directive, Fort Sill initiated evaluating and updating information management systems. During 1999, Fort Sill leaders examined communications systems and individual personal computers in offices throughout the post to identify possible problems. They updated software to ensure a smooth entrance to 2000 by testing and fixed key computers systems that operated energy, water, waste water, fire protection, and physical security services to ensure that they were Y2K compatible.[55]

Meanwhile, Fort Sill started writing a Y2K Contingency Plan in August 1999 that was integrated with DA and TRADOC efforts. The plan covered all aspects of the installation's operations and provided exercises to determine the post's ability to conduct normal activities if utilities were disrupted.[56] To write the plan Fort Sill formed a Y2K Contingency Plan Working Group and Transition Plan Committee in August 1999 under the Chief of Plans and Exercise Branch, Operations and Training Division, Directorate of Plans, Training, and Mobilization (DPTM). Over the course of the remaining months of 1999, the working group met sixteen times in preparation for the arrival of the millennium, tasked various post agencies for information and assistance, conducted exercises based on a scenario that utilities would fail for three days during the winter, and developed various plans of action. Completed in October 1999, the plan addressed diverse topics, such as the availability of generators, mobile kitchens, warming shelters, and communications, to name a few, and outlined a means for operating without outside utilities upon which the post was dependent. Based upon a final installation communications exercise with TRADOC on 7 December 1999, the Chief of Plans and Exercises Branch, Henry Holzheuser, felt confident that the post could meet any emergency caused by the new millennium. In fact, Mr. Holzheuser mentioned in December 1999 that the installation was prepared for Y2K disruptions if they came.[57]

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[55]"City Leaders Invite All to Meeting," Fort Sill Cannoneer, 14 Oct 99, pp 1a, 2a, Doc I-50; Email msg, subj: Y2K Information Paper, 27 Oct 99, Doc I-51; Memorandum for Cdrs, TRADOC Installations, subj: Installation-level Y2K Planning, 15 Oct 99; Email msg with atch, subj: Y2K Preparations, 8 Feb 00, Doc I-52.

[56]Email msg, subj: Upcoming Items, 8 Sep 99; Memorandum for Record, subj: Y2K Contingency Plan Working Group, 7 Sep 99, Doc I-53.

[57]"Installation Prep Squashes Bug," Fort Sill Cannoneer, 6 Jan 00, pp. 1a and 10b, Doc I-54; Email msg, subj: Y2K Tasking, 15 Nov 99, Doc I-55; Briefing, subj:

Decision Points, undated, Doc I-56; Briefing, subj: General Priority if Both Electricity and Gas Out, 13 Dec 99, Doc I-57; "What about My Money," Fort Sill Cannoneer, 24 Nov 99, pp. 1a, 2a, Doc I-58; "Group, Op Center Finalize Y2K Plan," Fort Sill Cannoneer, 9 Dec 99, pp. 1a, 8c, Doc I-59; "Dial 442-9Y2K," Fort Sill Cannoneer, 2 Dec 99, pp. 1a, 2a, Doc I-60; "Checking That List Twice," Fort Sill Cannoneer, 18 Nov 99, pp. 1a, 7a, Doc I-61; Executive Summary, Fort Sill Y2K Contingency Plan, Doc I-62; Draft Public Affairs Article, 4 Oct 99, Doc I-63; Fact Sheet, subj: Fort Sill's Y2K Plan, 15 Dec 99, Doc I-64; Email msg, subj: Y2K – The Final Stretch, 14 Oct 99, Doc I-65; Email msg, subj: Y2K Preparations, 8 Feb 00.

The preparations paid dividends. Operating from the installation's emergency operations center, a team composed of Fort Sill personnel and the 5045th Garrison Support Unit, an Army Reserve unit that was responsible for augmenting the Fort Sill staff, experienced a quiet night on 31 December 1999-1 January 2000. A cooperative effort, initiated by the Y2K Working Group months earlier, prevented any potential problems that might have occurred with the transition from the old century to the new century.[58] In response, the Directorate of DPTM, Lieutenant Colonel Britt E. Bray, wrote Mr. Holzheuser on 4 January 2000, "My compliments to you and the entire Y2K working group for all your hard work and effort. You did a super job of planning and coordinating and I have no doubt we were fully prepared for the worst."[59] **American Red Cross Emergency Processing Center**

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[58]Ibid.

[59]Email msg, subj: Thanks for the Y2K Work, 4 Jan 00, Doc I-66.

After serving as a test site for eighteen months, the American Red Cross opened its Fort Sill Armed Forces Emergency Center in July 1999 as one of two large emergency processing centers to meet the needs of military members and their families. This center along with the one in Church Falls, Virginia, replaced 145 Red Cross stations throughout the United States as a part of the three-year effort to modernize with advanced computer and telecommunications technology. The opening of the center at Fort Sill with its toll-free telephone number permitted members of the armed forces to contact their families in a crisis and carried on a tradition that began with the Spanish-American War of 1898.[60]

# CHAPTER TWO
# LEADERSHIP DEVELOPMENT: TRAINING AND EDUCATION

## INTRODUCTION

As it had done in the past, Training Command trained officers and soldiers in 1999 to employ fire support systems effectively. To accomplish this the Command automated scheduling, finished instituting Army values training in initial entry training in the U.S. Army Field Artillery Training Center, introduced gender-integrated training in initial entry training, continued implementing Total Army School Systems reforms, started using Distance Learning and Classroom XXI facilities, refined the Field Artillery Officer Basic Course, started revamping the Reserve Component Captains Professional Military Education to make it more accessible to Reserve Component officers, provided new equipment training to Active and Reserve Component officers, and worked on revising doctrinal publications to ensure currency.[1]

## AUTOMATED SCHEDULING

Driven by shrinking budgets and the need for a more effective method of scheduling classes for Training Command and range control, the Training Command took action. In mid-1997 the Warfighting Integration and Development Directorate (WIDD) directed by Training Command initiated a scheduling study to save money and time. Subsequently in November 1997, WIDD sent a three-person team with limited scheduling experience to the Infantry School at Fort Benning, Georgia, to

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[60]"American Red Cross Opens Largest Emergency Center," Fort Sill Cannoneer, 29 Jul 99, pp. 1a and 2a, Doc I-67.

[1]"Silhouettes of Steel," Field Artillery, Nov-Dec 99, p. 32, Doc II-1.

evaluate its automated scheduling program, called the TRADOC (U.S. Army Training and Doctrine Command) Automated Training Scheduling System (TATSS). Based upon the team's evaluation of TATSS and the WIDD study, WIDD recommended adopting TATSS because it would save money by automating scheduling and eliminating seven of eleven scheduling positions in Training Command.[2]

[2]Interview, Dastrup with Zari Conway, Scheduler, G3, Training Command, 19 Jan 00, Doc II-2; Memorandum for Record, subj: History of Automated Scheduling, 19 Jan 00, Doc II-3; Email with atch, subj: Review of Automated Scheduling, 28 Feb 00, Doc II-4.

In 1998 Training Command further evaluated TATSS. As WIDD explained to the training departments in the U.S. Army Field Artillery School, which would be the first to receive the system if adopted, TATSS would schedule classrooms and instructors, would identify scheduling conflicts, would create assignments, and would interface with the Army Range Management System. In short, TATSS would replace a manual scheduling system that was slow and unresponsive to the school's requirements. When TATSS was loaded with scheduling information from the Field Artillery School in mid-1998, however, it failed to meet the standard of performance wanted and could not be used. By this time, however, the school had already cut the scheduling positions, creating a difficult situation. The school had an automated scheduling system that did not work satisfactorily and also lacked schedulers to pick up the work load.[3]

Influenced by the Director of the Fire Support and Combined Arms Department (FSCAOD), Colonel L.G. Swartz, the Assistant Commandant of the Field Artillery School and Commanding General of Training Command, Brigadier General Lawrence R. Adair, conducted a meeting on 22 June 1998 to review the status of TATSS. FSCAOD briefed General Adair about TATSS's serious deficiencies and urged reviewing other automated scheduling systems to find a better one. At General

[3]Interview, Dastrup with Conway, 19 Jan 00; Memorandum for Record, subj: History of Automated Scheduling, 19 Jan 00; Email msg with atch, subj: Review of Automated Scheduling, 28 Feb 00.

Adair's direction, Training Command subsequently created a head scheduler in its G-3 (Operations) section with the task of evaluating and implementing other automated scheduling systems.[4]

[4]Interview, Dastrup with Conway, 19 Jan 00; Memorandum for Record, subj: History of Automated Scheduling, 19 Jan 00.

This led to appraising the Resource and Training Scheduling System (RATSS) that had been developed by George Paschetto of Fort Knox, Kentucky, in 1992 with subsequent versions being compatible with Microsoft Windows. Although RATSS had problems, it also had distinct advantages. Whereas TATSS was still basically a manual system with some automated capabilities, RATSS automatically scheduled classrooms and identified and provided reports on unique events, such as maintenance training, standard troop requirements, and facility charts, to name just a few advantages. In view of this, Training Command adopted RATSS in 1999 and consolidated initial scheduling in its G-3 section. By October 1999 FSCAOD and the Gunnery Department were using RATSS, and plans for scheduling classes in the Noncommissioned Officer's Academy in 2000 with RATSS existed.[5]

## ARMY VALUES IN INITIAL ENTRY TRAINING

Early in 1997, the U.S. Army responded rapidly and positively to the sexual harassment scandals that rocked advanced individual training (AIT) at Aberdeen Proving Ground, Maryland. Taking the scandals seriously, the Chief of Staff of the Army, General Dennis J. Reimer, tasked the U.S. Army Training and Doctrine Command (TRADOC) in May 1997 to take a fresh look at how the Army conducted initial entry training (IET), which included basic combat training (BCT), one-station unit training (OSUT), and AIT. As General Reimer explained, the Army needed highly trained soldiers that embodied its values, ethics, and traditions.[6] Subsequently, the findings of Department of Army Inspector General (DAIG) and the Siegfried panel that were released on 11 September 1997 criticized TRADOC's initial entry training. Among other things, the DAIG and the Siegfried panel detected a lack of focus on Army values, traditions, and history and insufficient leader involvement in training. In light of the scandals, General Reimer, the DAIG, and the Siegfried panel agreed about the necessity of changing initial entry training by spending more time on the "soldierization process" but not by reducing the time spent on technical skills. A general consensus existed within the Army. Values had to be instilled in the Army's soldiers in initial entry training that would be

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[5]Briefing, subj: Current Status of Automated Scheduling, 12 Aug 99, Doc II-5; Email msg with atch, subj: Review of Automated Scheduling, 28 Feb 00.

[6]Briefing, subj: BCT/OSUT Conference, 20-21 Nov 97, Doc II-2, 1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH); Memorandum for Record, subj: Information Obtained from Col Michael McKeeman, Cdr, FATC, on 17 Dec 97, Doc II-3, 1997 USAFACFS ACH.

carried with them throughout their military career.[7]

[7]1997 USAFACFS ACH, p. 15; Memorandum for Record, subj: How did we get here from Aberdeen? 29 Oct 98, Doc II-1, 1998 USAFACFS ACH; Memorandum for Record, subj: Training Development Support for the Additional Week in BCT, undated, Doc II-3, 1998 USAFACFS ACH.

To this end on 18 September 1997, General Reimer approved TRADOC's plan, which had been formulated during the summer of 1997, to implement an additional week of training in IET that would focus on Army ethics, values, heritage, and character development. General Reimer and other senior Army leaders felt that such training would foster a common identity and lessen many of the problems facing soldiers.[8]

Later, at a basic combat training/one station unit training conference in November 1997, TRADOC announced its proposed solutions in general terms, declared that the changes would be effective 1 October 1998, and pointed out that specifics would be forthcoming in February 1998. Besides recognizing the need to increase the technical quality of soldiers leaving the training base, TRADOC explained that training had to produce disciplined, team-oriented soldiers

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[8]1997 USAFACFS ACH, p. 15; Memorandum for Record, subj: Training Development Support for the Additional Week in BCT, undated, Doc II-3, 1998 USAFACFS ACH; Memorandum for Record, subj: How did we get here from Aberdeen? 29 Oct 98; Msg, Col Guy Bourn, Chief of Staff, USAFACFS, to Col Herbert G. Brown, Dir, DPTM, subj: Branch History Video Tasker, 7 Feb 98, Doc II-2, 1998 USAFACFS ACH; "IET: Starting the Soldier Out Right," Field Artillery, Mar-Apr 99, pp. 3-5, Doc II-2A, 1998 USAFACFS ACH; MG Leo J. Baxter, "IET: Where Values and Excellence Begin," Field Artillery, Mar-Apr 99, pp. 1-2, Doc II-2B, 1998 USAFACFS ACH; LTC Michael A. Byrd, "Army Values and Basic Training," Field Artillery, Mar-Apr 99, p. 40, Doc II-2C, 1998 USAFACFS ACH.

that embraced Army values and heritage. To create such soldiers TRADOC said that IET would be expanded by one week as approved by General Reimer and that the program of instruction (POI) would be revised to include more training on values, heritage, and history and to increase the trainees' contact time with the chain of command and the drill sergeants. Initial entry training also had to be more challenging, rigorous, and team-work oriented. Specifically, basic combat training would be expanded from eight to nine weeks, and advanced individual training would be lengthened a maximum of two days to accommodate the increased training on Army values, which was a high priority.[9]

[9] 1997 USAFACFS ACH, pp. 15-16; Memorandum for Record, subj: How did we get here from Aberdeen? 29 Oct 98; Baxter, "IET: Where Values and Excellence Begin," pp. 1-2; Byrd, "Army Values and Basic Training," p. 40.

Ultimately, restructuring initial entry training demanded more resources. At the November 1997 conference the commander of the U.S. Army Field Artillery Training Center at Fort Sill, Oklahoma, reminded TRADOC that "giving us a new mission without the resources only exacerbates the problem" already caused by shrinking resources, both monetary and personnel. In response, TRADOC assured the commander and other conference attendees that the resources would be available to execute the mission. As 1997 drew to a close, the commander of the training center awaited further guidance on the new initial entry training program of instruction and additional resources, but the resources were never forthcoming.[10]

Late in 1997 and early in 1998, in the meantime, TRADOC issued more detailed instruction on the expanded IET and values training. The command directed the U.S. Army Field Artillery School and other branch proponents to provide subject matter experts to work with U.S. Army Training Support Center personnel and training development contractors to develop new and revised training support packages in their areas of expertise. The packages would incorporate values and human relations tasks for the additional week of BCT that was scheduled to begin in October 1998. At the same time the U.S. Army Field Artillery Training Center had to revise its entire BCT program of instruction by integrating values into all training.[11]

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[10]1997 USAFACFS ACH, p. 16.

[11]Memorandum for See Distribution, subj: Training Development Support for the Additional Week in BCT, undated, Doc II-3, 1998 USAFACFS ACH.

As a part of this effort, TRADOC directed each branch proponent to produce a ten to twenty minute branch heritage video for AIT by 1 October 1998. Through the video Fort Sill would teach branch heritage and history within the context of Army core values, discipline, and teamwork. Funded by the U.S. Army Training Support Center, the heritage video would be shown as part of branch history instruction conducted in branch museums during AIT and would highlight branch heroes that epitomized the Army values of loyalty, duty, respect, selfless service, honor, integrity, and personal courage that had been approved by General Reimer on 13 January 1998. Besides the heritage video, posters, soldier's card with the soldier's code and values, naming ranges after Medal of Honor recipients and all IET training would reinforce the Army values.[12]

Following TRADOC' charge, the U.S. Army Field Artillery Training Center integrated values training into its program of instruction. Beginning during the last months of 1998, each IET soldier received a dog tag with the Army values on it and

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[12]Msg, Bourn to Brown, subj: Branch History Video Tasker, 7 Feb 98; Msg, subj: Army Values, 171134Z Feb 98, Doc II-4, 1998 USAFACFS ACH; Msg, subj: Branch History Video Tasker, 23 Feb 98, Doc II-5, 1998 USAFACFS ACH; Msg, subj: IET Extension-Branch History/Heritage Videotapes, 28 Jan 98, Doc II-6, 1998 USAFACFS ACH; "New Soldiers Take to Values Training," Army Link News, 25 Sep 98, Doc II-7, 1998 USAFACFS ACH; Memorandum for Record, subj: Values Training Dog Tag Card and Army Values Card, 25 Jan 99, Doc II-8, 1998 USAFACFS ACH; Byrd, "Army Values and Basic Training," p. 40.

a plastic, wallet-size card with the Army values and soldier's code on it and went through a program of instruction with values thoroughly integrated throughout it. In January 1999 the Field Artillery Training Center received copies of the branch heritage film for showing to AIT soldiers in Fort Sill's branch museum. This reoriented training promised to instill values and field artillery heritage in every soldier that passed through IET.[13]

[13]Memorandum for Record, subj: Values Training Dog Tag Card and Army Values Card, 25 Jan 99; Memorandum for Record, subj: Values Training and Museum Visits, 27 Jan 99, Doc II-9, 1998 USAFACFS ACH; Memorandum for Record, subj: Field Artillery: King of Battle, 27 Jan 99, Doc II-10, 1998 USAFACFS ACH.

Besides the branch heritage film and dog tag, the Field Artillery Training Center incorporated values training into every aspect of its program of instruction in 1998-1999 as the program of instruction indicated. Within minutes of arriving at the center, the new trainees received values training by their drill sergeants, who introduced them to the seven Army values. From that point on, values training formed a critical theme in basic combat training. Drill sergeants or a member of the Field Artillery Training Center staff told trainees how the values were relevant to training, such as basic rifle marksmanship, rifle bayonet training, first aid instruction, and physical training, to name just a few. Drill sergeants, for example, pointed out that it took personal courage to hold a live grenade in one's chest and then to throw it, a requirement for graduation. Some soldiers even learned selfless service by donating blood.[14]

## GENDER-INTEGRATED TRAINING

Over a period of eight months in 1998 and 1999, the Army made significant changes in initial entry training (IET) that had a momentous impact on Fort Sill. On 24 and 25 June 1998 the Deputy Commanding General for Initial Entry Training at the U.S. Army Training and Doctrine Command (TRADOC), Lieutenant General William J. Bolt, visited Fort Sill. He met with commanders, observed training, and talked with noncommissioned officers and soldiers in initial entry training and one station unit training (OSUT). During his visit, he announced that TRADOC was closing one of its gender-integrated training bases (GIT) -- Fort McClellan, Alabama -- as a result of the downsizing of the Army and had to move its chemical and military police gender-integrated training to Fort Leonard Wood, Missouri. Because Fort Leonard Wood lacked sufficient space for the additional training load and because female soldiers were entering the Army in increasing numbers, TRADOC had to relocate gender-integrated IET to some other unspecified location. Several months after General Bolt's visit on 29 January 1999, the Department of the Army officially announced that Fort Leonard Wood's gender-integrated IET would be transferred to Fort Sill in 1999 on a temporary basis until additional facilities could be completed at the Missouri installation sometime around 2004. At that time gender-integrated IET would be relocated from Fort Sill to Fort Leonard Wood.[15]

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[14]Byrd, "Army Values and Basic Training," p. 40.

[15]"Sill Considered for Expanded Mission," Fort Sill Cannoneer, 2 Jul 98, pp. 1a, 2a, Doc II-11, 1998 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH); MG Leo J. Baxter, "IET: Where Values and Excellence Begin," Field Artillery, Mar-Apr 99, pp. 1-2, Doc II-2B, 1998 USAFACFS; LTC Ann L. Horner, "Leadership is

Leadership: Regardless of Gender," Field Artillery, May-Jun 99, pp. 40-41, Doc II-6; Interview, Dastrup with Maj Mary A. Baker, Field Artillery Training Center, Fort Sill, S-3 (Operations Officer), 7 Feb 00, Doc II-7; U.S. Army News Release, "Fort Sill to Begin Gender-Integrated Basic Training," 28 Jan 99, Doc II-8; Email msg, subj: GIT, 9 Feb 00, Doc II-9.

Because only twenty-five to thirty female soldiers trained annual at Fort Sill up to this point, Fort Sill faced making far-reaching changes to accommodate gender-integrated training and took action before the official announcement was made. Although the number of female trainees would be approximately 2,500 in Fiscal Year (FY) 1999 and 5,000 in FY 2001, they would not augment the current training load. The load would remain the same, but there would be more females in the training mix. In a memorandum to the Commanding General of TRADOC, General John N. Abrams, in December 1998, the Commanding General of Fort Sill, Major General Leo J. Baxter, explained the pressing requirement for additional resources to satisfy the anticipated increase in female trainees created by gender-integrated training. He pointed out, "Our current structure includes 15 Basic Combat Training (BCT) batteries intermixed with 13B10-OSUT and AIT [advanced individual training] within five training batteries. Our current battery-level structure is sufficient for the mission; however, given historical fluctuation in accessions, it will require the implementation of GIT in all 15 BCT batteries."[16] He requested sixty-eight experienced female drill sergeants for the first year of GIT to have as many women role models as possible. After GIT had been initiated, the number of female drill sergeants could be reduced to thirty four. General Baxter also sought additional chaplains and their assistants because they were force multipliers.[17]

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[16]Memorandum for Cdr, TRADOC, subj: GIT Resource Requirements, 8 Dec 98, Doc II-10; Email msg with atch, subj: GIT Memo to CG, 21 Jan 00, Doc II-10A.

[17]Memorandum for Cdr, TRADOC, subj: GIT Resource Requirements, 8 Dec 98.

Although General Baxter addressed additional issues in the memorandum to the Commanding General of TRADOC, the separate and secure requirement issue loomed as one of the most critical. The FY 1999 National Defense Authorization Act mandated separate and secure living areas for male and female trainees. As outlined by the Secretary of Defense on 16 March 1998, the act required that each gender would have its own independent sleeping area, would have its own latrine, and would have its own entrance to the living area; that entrances to the living areas would be locked at night; that door alarms would be installed; that a fire-safe barrier wall would be well placed between the genders on the same floor and alarmed; and that separate buildings would be used when the above conditions could not be met. Additionally, supervisory steps would be implemented to augment the physical measures. Fort Sill would have to have drill sergeants and other unit chain-of-command personnel in the barracks during after duty hours for supervision.[18] In a memorandum in May 1998, the Deputy Chief of Staff for Training in TRADOC, Major General Leroy R. Goff III, clearly wrote about the importance of the separate and secure standards. He explained, "The security of our barracks and supervision of our IET soldiers is an intrinsic part of our requirement to ensure a safe and secure environment for our soldiers."[19]

In January 1999 TRADOC responded to Fort Sill's request for more resources. After a staff visit on 5-6 January 1999 when Fort Sill outlined its requirements in a series of briefings, TRADOC concurred with the need and later provided funding for gender-integrated training.[20]

During the first half of 1999, Fort Sill employed the funding to prepare for GIT to begin in the summer. Although the Field Artillery Training Center did not alter the quality or rigor of the training regimen, the post added more female

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[18]Briefing, subj: Escort Policy, 13 Apr 99, Doc II-11; Memorandum for See Distribution, subj: Implementation of Separate and Secure Gender Living Areas and Increased Rigor in BCT and OSUT, undated, Doc II-12; Memorandum for See Distribution, subj: Physical Separation of Genders in IET, 10 Apr 98, Doc II-13; Memorandum for Distribution, subj: Standards for Separate and Secure Barracks in AIT, 1 May 98, Doc II-14; Memorandum for See Distribution, subj: Minutes from 1 Dec 98 GIT Charter Meeting, 7 Dec 98, Doc II-15.

[19]Memorandum for See Distribution, subj: Barracks Supervision After Duty Hours, 1 May 98, Doc II-16.

[20]Memorandum for See Distribution, subj: TRADOC Staff Assistance Visit on GIT, 5-7 Jan 99, 24 Dec 98, Doc II-17; Interview, Dastrup with Baker, 7 Feb 00.

drill sergeants, renovated billets to meet the needs of female trainees and their safety, and sponsored cadre classes and briefings on physical training, medical support, and other pertinent topics to help existing drill sergeants and staff make the necessary adjustments. The training involved conducting mandatory training on mental health, injury prevention, proper running techniques, and other topics and sending drill sergeants to Fort Jackson, South Carolina, or Fort Leonard Wood where they basically learned that gender-integrated training would not produce any changes in training and reduce standards.[21]

[21]"Gender-integrated Training Update," Fort Sill Cannoneer, 8 Jul 99, p. 4a, Doc II-18; Baxter, "IET: Where Values and Excellence Begin," pp. 1-2; "IET: Starting the Soldier Out Right," Field Artillery, Mar-Apr 99, pp. 3-5, Doc II-19; Horner, "Leadership is Leadership: Regardless of Gender," pp. 40-41; Memorandum for Cdr, TRADOC, subj: GIT Resource Requirements, 8 Dec 98, Doc II-20; Email msg with Atchs, subj: GIT Memo to CG, 21 Jan 00, Doc II-21; Interview, Dastrup with Baker, 7 Feb 00; Operation Order 8-99, 17 Dec 98, Doc II-22; Memorandum for See Distribution, subj: GIT Mandatory Classes, 3 Mar 99, Doc II-23.

Equally important, the Field Artillery Training Center had to establish a holdover detachment. As of 1998 and early 1999, the center's holdovers remained billeted in their assigned training units. For every holdover the center lost a training seat. The separate and secure requirements of gender-integrated training compounded this problem because the center could not mix male and female holdovers in the same bay. This led to the creation of a holdover detachment in 1999 that could maintain command and control of a holdover load of 250 and to the acquisition of additional resources from TRADOC to meet the requirement.[22]

In July 1999 just after gender-integrated training had been initiated during the previous month, the Commander of the Field Artillery Training Center, Colonel Gerard M. Walsh, outlined his observations.[23] Although the center and Fort Sill had to make some adjustments, he noted that standards and values had not been compromised, that male and female trainees were highly motivated, and that the female trainees demonstrated the same aggressiveness, toughness, and initiative as their male counterparts. Gender-integrated training was "right on track."[24]

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[22]Memorandum for Cdr, TRADOC, subj: GIT Resource Requirements, 8 Dec 98; Memorandum for Chief of Staff with Atchs, subj: Increased Training Missions at Fort Sill, 26 Jan 99, Doc II-24; Memorandum for Cdr, TRADOC, subj: FY99 Increased Training Mission - BCT +300, 19 Mar 99, Doc II-25; Email msg, subj: Holdovers, 28 Jan 00, Doc II-25A.

[23]Memorandum for Record, subj: BCT Battery Fill, 31 Jan 00, Doc II-26.

[24]"Gender-integrated Training Update," p. 4a;

Memorandum for Record, subj: 1st Battalion, 19th Field Artillery Annual Historic Review for CY 99, 20 Jan 00, Doc II-27; Memorandum for Record, subj: HHB Annual Historic Review for CY99, 10 Jan 00, Doc II-28.

Subsequently, the Commanding General of Fort Sill, Major General Toney Stricklin, provided his endorsement of gender-integrated training. In September 1999 he wrote to soldiers and civilians, "As the individual charged with ensuring that all soldiers at Fort Sill are treated with respect and dignity, I want to emphasize the importance of Fort Sill's gender integrated training program. . . . The Army trains as its fights."[25] The General then added, "All cadre personnel, including military, DOD [Department of Defense] civilian, and contractor personnel, involved with initial entry training soldiers play an essential role in fostering a positive and professional environment for new soldiers."[26]

## THE TOTAL ARMY SCHOOL SYSTEM

In 1999 the Total Army School System (TASS) continued to be a major Army Training XXI initiative as it had been since the mid-1990s.[27] In response to the tasking from the Chief of Staff of the U.S. Army, General Gordon R. Sullivan, to develop a Total Army School System for the twenty-first century, the U.S. Army Training and Doctrine Command (TRADOC) organized Task Force Future Army Schools Twenty-One (FAST) under the Deputy Chief of Staff for Training early in 1992. Directed by the Commanding General of TRADOC, General Frederick M. Franks, Jr., Task Force FAST had the mission of establishing an effective and efficient Total Army School System of fully accredited and integrated active component (AC) and reserve component (RC) schools that would furnish standardized individual training and education for the Total Army that would be taught to a single standard.[28] Looking to the future and expounding upon his guidance, General Franks explained, "America's Army needs a cohesive institutional training system that leverages available resources and investments currently in the Total Army School System. We need a Post Cold War Total Army School System across components. As we reduce the size of the components, we must also reduce our institutional training investments."[29]

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[25]Memorandum for See Distribution, subj: Gender Integrated Training, 8 Sep 99, Doc II-29.

[26]Ibid.

[27]"One School System Will Serve All Soldiers," Fort Sill Cannoneer, 9 Sep 99, p. 6c, Doc II-30. This is an interesting article about the Total Army School System as of September 1999. See the 1998 USAFACFS ACH, pp. 28-30, for information on the early years of TASS.

[28]1996 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 35-36.

[29]1995 USAFACFS ACH, p. 46. See Army Training XXI in

1997 USAFACFS ACH, pp. 17-19, for background information on Army Training XXI and its relationship to the Total Army School System.

TRADOC considered such a school system to be a major break with the past. Over the years, the AC, the Army National Guard (ARNG), and the U.S. Army Reserve (USAR) had developed independent school systems with separate standards. The downsizing of the Army with its attending budget reductions and the Gulf War of 1990-1991 that highlighted training differences between the active component and the reserve components with latter emphasizing collective training to the detriment of individual skills made the three separate school systems uneconomical, inefficient, and anachronistic. By creating a single system and standard Task Force FAST would abolish the existing system, create a coalition of schools, and simultaneously save money.[30]

In 1992-1993 Task Force FAST organized TASS under the regional schools concept. The task force divided the continental United States (CONUS) into seven geographical regions. Each region had six colleges (brigades) to oversee instruction in leadership, officer education, health services, combat arms, combat support, and combat service support. Below the college-level the task force placed departments (school battalions). Each school battalion was aligned with an active component school and was responsible for providing instruction in a particular career management field. For example, the U.S. Army Field Artillery School (USAFAS) was aligned with field artillery school battalions in each region.[31]

Beginning in January 1993 and continuing into 1995, Task Force FAST organized a prototype school system in Region C to test the TASS concept and phased in the remainder of the regional schools by 1997. Composed of the states of North Carolina, South Carolina, Georgia, and Florida, the Commonwealth of Puerto Rico, and the U.S. Virgin Islands, Region C had a regional coordinating element, renamed TRADOC Integration Element in 1999. The regional coordinating element established brigades and proponent-aligned battalions, utilizing the existing resources within the region, and worked

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[30]Ibid.; 1996 USAFACFS ACH, p. 36; 1994 TRADOC Annual Command History (Extract), pp. 46-48.

[31]1996 USAFACFS ACH, pp. 36-37.

to see that the region's school battalions were properly accredited.[32]

[32] 1996 USAFACFS ACH, pp. 37-38; 1998 USAFACFS ACH, p. 29.

As TRADOC organized the school systems for each of the seven regions, USAFAS began accrediting field artillery school battalions. Between 1996 and 1998 USAFAS accredited Region C, Region E, and USAFAS field artillery school battalions to teach field artillery subjects. In the meantime, USAFAS made accreditation visits in 1997 and 1998 to school battalions in Region F and Region G and determined that additional work was required before they could be accredited. In 1999 the field artillery school battalions in Regions A, B, C, D, F, and G received accreditation from USAFAS to make all seven field artillery school battalions accredited by 1999. Accreditation, which was required every three years, permitted field artillery school battalions and training sites to teach USAFAS courses and use USAFAS-approved courseware.[33]

Another important goal of TASS involved converting all instruction to Total Army Training System (TATS) courses. Through 1995 AC courses used by the RC were configured to fit the time, equipment, and facility constraints of the RC training environment. Only those tasks deemed important by the proponent to prepare reservists for mobilization were included in reserve component courses. Under TATS all critical tasks selected for active component training would be trained in the reserve component. In 1995-1998 USAFAS converted twenty-seven field artillery enlisted courses to TATS courseware, which meant that active and reserve component soldiers would be trained to the same standard, digitized them, placed them on the Internet in 1998-1999, and provided TATS courseware to training institutions. Meanwhile in 1998, the School revised the Officer Advance Course program of instruction in TATS format, put it on the Internet, and signed an agreement to digitize twenty-two additional courses, digitized them in 1998-1999, and placed them on the Internet. This digitization effort complemented work on multimedia products for Captain Professional Education and an initiative began in 1998 to redesign TATS courseware to distance learning multimedia products.[34]

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[33] 1996 USAFACFS ACH, pp. 37-38; Interview, Dastrup with Sharon Dorrell, WIDD, 19 Jan 99, Doc II-14, 1998 USAFACFS ACH; TRADOC Regulation 351-18 (Extract), Appendix C, Doc II-15, 1998 USAFACFS ACH; Interview, Dastrup with Sharon Dorrell, WIDD, 8 Feb 00, Doc II-31; Memorandum for See Distribution, subj: FY99 TASS Information Memorandum #2, 26 May 99, Doc II-32; Memorandum for Record, subj: TRADOC Integration Elements, 8 Feb 00, Doc II-33; Email msg, subj: Total Army School System, 9 Feb 00, Doc II-34. See the map in Memorandum for Record, subj: TRADOC Integration Elements, 8 Feb 00, for a map of the regions and their states.

[34] Briefing, subj: TATS Courseware Implementation

Schematic Profile Update, 1998, Doc II-16, 1998 USAFACFS ACH; Interview, Dastrup with Dorrell, WIDD, 8 Feb 00; USAFAS Total Army Training System, 8 Feb 00, Doc II-35; Memorandum for See Distribution, subj: FY99 TASS Information Memorandum #2, 26 May 99; Email msg, subj: Total Army School System, 9 Feb 00.

## DISTANCE LEARNING

Using its distance learning plan developed in 1996 as a guide, the U.S. Army Field Artillery School worked to implement distance learning in 1997-1999. During 1997, the School produced digitized lessons, interactive computer-based modules, and on-line training modules for field artillery military occupational specialties (MOS). Specifically, the School completed 170 digital lessons for MOSs 13B (Field Artillery Cannon Crew Member), 13E (Field Artillery Cannon Fire Direction Specialist), and 13M (Multiple-Launch Rocket System [MLRS] Crew Member) that could be used for formal and refresher training and completed 185 digital lessons for MOS 13F (Field Artillery Fire Support Specialist) by mid-year. In 1998 the School finished converting MOSs 13M, 13C (AFATDS Operation Specialist), 13P (MLRS Fire Direction Specialist), and 131A (warrant officer) to TATS courseware. The lessons for MOS 13F, for example, were developed in forty-eight modules on eighteen CD-ROMs for formal and refresher training and could be ordered from the U.S. Army Training Support Center, Fort Eustis, Virginia. The lessons for each MOS contained video clips of instructors teaching, demonstrations on equipment, terrain features, and simulated exercises, while each module had a series of teaching objectives, practical exercises, and examinations and permitted student interaction at any point during the learning process. By the end of 1998 and the first of 1999, the School also had converted all twenty-seven of its field artillery enlisted courses and the Field Artillery Officer Advance Course to TATS and put them on the Internet for reserve and active component use. This effort moved the Field Artillery School farther along the path that would transform training from instructor-centered to student-centered, computer-generated training and propelled it further along from paper-based to multimedia module-based training.[35]

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[35]1997 USAFACFS ACH, p. 23; Briefing, subj: TATS Courseware Implementation Schematic Profile Update, 1998, Doc II-20, 1998 USAFACFS ACH; USAFAS Total Army Training System (Extract), 8 Feb 00, Doc II-35; Email msg, subj: Distance Learning, 10 Feb 00, Doc II-36; Memorandum for Distribution with atch, subj: Coordinating Draft of the Army

Distance Learning Operations Directive, 23 May 96, Doc II-36A.

Meanwhile, the School signed an agreement in 1998 with TRADOC to redesign TATS courseware to distance learning multimedia products. As of 1998-1999, MOS 13B10 (Field Artillery Cannon Crew Member) and MOS 13P10 (MLRS Fire Direction Specialist), MOS 13P30 (MLRS Operations/Fire Direction Computer for the Basic Noncommissioned Officer Course), and MOS 13P40 (MLRS Senior Sergeant for the Advanced Noncommissioned Officer Course) were in production, while MOS 13B Paladin New Equipment Training Course, MOS 13F10 (Field Artillery Fire Support Specialist), MOS 13F30 (Field Artillery Fire Support Sergeant for the Basic Noncommissioned Officer Course), and MOSs 13M10/30/40 (MLRS Crew Member) were completed.[36]

As a part of the Department of the Army's (DA) distance learning effort, TRADOC installed three distance learning

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[36]Briefing, subj: TATS Courseware Implementation Schematic Profile Update, 1998; Email msg, subj: Distance Learning, 10 Feb 00.

classrooms in Snow Hall, based upon a memorandum of agreement signed by TRADOC and the Field Artillery School on 15 October 1997. Funded by DA and completed late in 1998, the three distance learning classrooms provided the technology to support training delivery to active and reserve component soldiers and civilians.[37]

[37]Memorandum for Dir, WIDD, subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97, Doc II-21, 1998 USAFACFS ACH; Interview, Dastrup with Bill Lodes, WIDD, 4 Feb 99, Doc II-22, 1998 USAFACFS ACH; Briefing (Extract), subj: TATS Courseware Implementation Schematic Profile, 1998; Briefing (Extract), subj: Training the Field Artillery, 28 Feb 98, Doc II-22A, 1998 USAFACFS ACH; Memorandum for Director, WIDD, subj: Coordination of 1998 USAFACFS Annual Command History, 15 Mar 99.

When the distance learning facilities became available, the Field Artillery School started using them in 1999. During the year, the School taught seventeen distance learning classes to over one hundred students and conducted approximately fifty-five briefings, workshops, in-process reviews, video tele-conferences, audio tele-conferences, and Multiple-Launch Rocket System (MLRS) 3X6 conversion training to the 5-113th Field Artillery of the North Carolina Army National Guard and the 2-147th Field Artillery of the South Dakota Army National Guard. As organized in 1999, the conversion training consisted of four phases. Phases two through four were scheduled to be conducted during annual training during 2001-2003, while phase one, which was MOS training, was completed in 1999 via distance learning. The Field Artillery School hired two civilian distance learning instructors to provide the training.[38]

Captain Robert F. Markovetz, Jr., of the 2-147th Field Artillery explained in the fall of 1999 that distance learning for the conversion to the MLRS 3X6 force structure proved to be a major breakthrough, although growing pains existed. Because the South Dakota Army National Guard did not have adequate facilities, it used computer laboratories and video tele-conference rooms at Northern State University, Aberdeen, South Dakota, for MLRS Crew Member training and computer laboratories and video tele-conference rooms Lake Area Technical Institute, Watertown, South Dakota, for MLRS Specialist training. Over a course of about three months, South Dakota Army National Guard soldiers completed CD-ROM based instruction and video tele-training instruction. The latter permitted the soldiers to ask a MOS-qualified instructors questions on the material covered in the CD ROMs and take quizzes. Ultimately, distance learning saved the South Dakota Army National Guard time and money and was the wave of the future, according to Captain Markovetz, and worked well. However, the potential of distance learning in 1999 remained untapped because of the limited number of courses that had been designed for distance learning. This, however, would change in the future as the Field Artillery School began producing more courses.[39]

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[38]Interview, Dastrup with Bill Lodes, WIDD, 26 Jan 00, Doc II-37; Memorandum for Record, subj: USAFAS Distance Learning Classrooms, 26 Jan 00, Doc II-38; Briefing, subj: Gunnery Department, 20 Jul 99, Doc II-39; Memorandum for Assistant Commandant, USAFAS, subj: SIGACTS, 9 Jul 99, Doc II-40; Memorandum for Assistant Commandant, USAFAS, subj: SIGACTS, 26 Mar 99, Doc II-41.

[39]CPT Robert F. Markovetz, Jr., "Distance Learning: MLRS 3X6 Conversion for the Army National Guard," Field Artillery, Sep-Oct 99, pp. 42-43, Doc II-42; Memorandum for

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Record, subj: USAFAS Distance Learning Classrooms, 26 Jan 00; Interview, Dastrup with Lodes, 26 Jan 00; Memorandum for Assistant Commandant, USAFAS, subj: SIGACTS, 26 Mar 99.

Backed with funding, the U.S. Army Training and Doctrine Command (TRADOC) launched a classroom modernization effort and a Classroom XXI initiative in 1995 to exploit high technology to improve classroom training. Initially, TRADOC tasked its service schools to explain how they would use the money to enhance training. Later in December 1995, TRADOC directed them to appoint a Classroom XXI point of contact and to develop a Classroom XXI implementation plan during 1996. Although Training Command, U.S. Army Field Artillery Center and Fort Sill (USAFACFS), which consisted of the U.S. Army Field Artillery School (USAFAS), the Noncommissioned Officers Academy (NCOA), and the U.S. Army Field Artillery Training Center (USAFATC), was not sure how it planned to spend the money, it had ideas. In 1995 Training Command outlined expanding the use of distance learning, integrating USAFAS with other TRADOC schools, expanding the use of multimedia courseware, bringing simulations into the classroom, employing the Internet, and upgrading training in general.[40]

In 1995 Training Command's concept for Classroom XXI consisted of five major elements. A TRADOC term, Campus Area Network (CAN) would connect the various USAFAS buildings into one communications network, while the Local Area Network (LAN), a Training Command concept, would be the communication technology inside the buildings. The CAN and LAN formed the backbone of Classroom XXI, while simulation-enhanced instruction classrooms to permit greater use of simulations, multimedia-enhanced instruction classrooms to furnish more effective and varied training, and computer-enhanced instruction classrooms would provide the trimmings. Training Command planned to convert existing classrooms in Snow Hall to simulation-enhanced instruction classrooms and multimedia-enhanced instruction classrooms in Fiscal Year (FY) 1996 but would not introduce computer-enhanced instruction classrooms until FY 1997 because the School was still developing the instruction.[41]

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[40] 1996 USAFACFS ACH, pp. 49-50.

[41] Ibid., pp. 50-51.

In 1996 Training Command initiated work on classroom modernization and Classroom XXI infrastructure by leveraging technology to enhance resident instruction and to support the Total Army School System (TASS). Using a fiber optics CAN, it tied Knox Hall, I-See-O Hall, Snow Hall, Searby Hall, Summerall Hall, and Burleson Hall (all were part of the USAFAS campus) into one communications network, completed LANs in each respective building, and implemented the Internet link.[42] In the meantime, Training Command modernized its classrooms, another major objective, in 1996-1997. During 1996 Training Command constructed eleven classrooms with multimedia overheads. Some of the rooms had access to the LAN, video recorders, large-screen televisions, and instructor computer work stations. Training Command also built one classroom with computer-based instruction capabilities and two classrooms each with a Janus simulation system. The following year, Training Command added FATC and NCOA to the LAN and CAN, connected FATC and NCOA to two-way audio video, the simulation center, and the Internet, and created more computer-enhanced classrooms.[43]

As work proceeded with the CAN, LAN, and classroom modernization, Training Command developed a Classroom XXI implementation plan late in 1996 as directed by TRADOC. Basically, the plan continued the initiatives started in 1995-1996 and refined them. According to the plan, fiber optics networks, Internet, CD-ROM, and other technologies of the Classroom XXI modernization effort would be introduced over the next several years beginning in 1997 and would provide Training Command with worldwide access to digital information, training, and simulations.[44]

In October 1997 the Field Artillery School signed a memorandum of agreement with TRADOC to bring one Digital Training Access Center (DTAC) on line, to install three Distance Learning classrooms, and to install one Classroom XXI classroom. Classroom XXI would support institutional resident training and serve as a platform to export resident training to distance learning facilities, while Distance Learning classrooms would provide the ability to deliver training to active and reserve component soldiers and civilians with access to distance learning facilities. The Digitized Training Access Center would electronically store and

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[42]Ibid., p. 51.

[43]Ibid., pp. 51-52; 1997 USAFACFS ACH, p. 25.

[44]1996 USAFACFS ACH, pp. 51-52; 1997 USAFACFS ACH, p. 25; Memorandum for Director, WIDD, subj: Coordination of 1998 USAFACFS Annual Command History, 15 Mar 99, Doc II-19A, 1998 USAFACFS ACH.

distribute the digital proponent record copy of approved training materials.[45] Funded by the Department of the Army, TRADOC installed three Distance Learning classrooms at Fort

[45]Briefing (Extract), subj: Training the Field Artillery, 28 Feb 98; Memorandum (Extract) for Director, WIDD, subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97, Doc II-23, 1998 USAFACFS ACH; Email msg with atch, subj: Classroom XXI, 8 Feb 00, Doc II-43.

Sill late in 1998 and a Digital Training Access Center to store the digital proponent record copy of approved training materials.[46]

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[46]Briefing, subj: TATS Courseware Implementation Schematic Profile Update, 1998, Doc II-24, 1998 USAFACFS ACH; Memorandum for Dir, WIDD (Extract), subj: Memorandum of Agreement for Classroom XXI and Distance Learning, 15 Oct 97, Doc II-16, 1997 USAFACFS ACH; Interview, Dastrup with Bill Lodes, WIDD, 4 Feb 99, Doc II-25, 1998 USAFACFS ACH; Briefing, subj: Classroom XXI, Feb 99, Doc II-26, 1998 USAFACFS ACH; Memorandum for Director, WIDD, subj: Coordination of 1998 USAFACFS Annual Command History, 15 Mar 99.

In 1999 one Classroom XXI that was funded by the Department of the Army and three Distance Learning rooms that were funded by TRADOC became fully functional. The rooms consisted of student computer workstations with Internet access, instructor workstations, teleconferencing capabilities, and other advanced technologies. Along with the classroom modernization effort of recent years, Classroom XXI and Distance Learning classrooms indicated a commitment to employing state-of-the-art technology to train resident and nonresident students.[47]

## FIELD ARTILLERY OFFICER BASIC COURSE

[47]Interview, Dastrup with Bill Lodes, WIDD, 26 Jan 00, Doc II-37; Memorandum for Record, subj: USAFAS Distance Learning Classrooms, 26 Jan 00, Doc II-38; Email msg with atch, subj: Classroom XXI, 8 Feb 00; Email msg with atch, subj: Classroom XXI, 17 Feb 00, Doc II-44; Email msg, subj: Classroom XXI, 18 Feb 00, Doc II-45; Email msg with atchs, subj: Classroom XXI, 18 Feb 00, Doc II-46.

As in the past, the Field Artillery Officer Basic Course (FAOBC) continued its mission in 1999 of turning newly commissioned second lieutenants into Field Artillery leaders in nineteen and one-half weeks. To do this, the Field Artillery School conducted a three-phase FAOBC that had been implemented several years earlier under the leadership of the Gunnery Department. Phase one (Foundation) lasted the first seven weeks, focused on platoon leader skills, such as reconnaissance, selection, and occupation of a position; communications; observed fire; maintenance; and mounted and dismounted land navigation, to name just a few, and had one field training exercise. In phase two (Pillars) that took place during the eighth through thirteenth week, the school taught manual and automated gunnery and basic fire support and conducted one field training exercise. During phase three (Capstone) that began the fifteenth week of the course, the second lieutenants learned more automated gunnery techniques and received combined arms training along with other critical fire support instruction. The other instruction included joint operations along with a JANUS computer exercise and a dismounted fire support officer exercise, commonly called the Light Fire Support Officer Lane. During the last two weeks of the course, the school divided the student officers into one of three specialized instructional courses or "tracks" based upon the weapons system in their first units of assignment to give more hands on experience. Students in the cannon tracks (heavy or light) capped FAOBC with the Redleg War which pulled together everything that they had learned during the course. During the war, they served as a member of a fire direction center and a howitzer crew, worked as a company fire support officer, received familiarization training on the Q-36 radar, and learned the capabilities of close air support.[48]

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[48]Briefing, subj: Field Artillery Officer Basic Course, 1999, Doc II-47; "Silhouettes of Steel," Field Artillery, Nov-Dec 99, p. 32, Doc II-48; CPT Ferdinand Burns III, "OBC: Training the New Lieutenant," Field Artillery, Mar-Apr 99, p. 35, Doc II-49; Fact Sheet, subj: OBC Fire Support Training: A Synopsis, Apr 99, Doc II-50; Memorandum for Record, subj: FAOBC, 17 Mar 00, Doc II-51; Memo from Mr. Rowzee, Gunnery Department Operations, to Dr. Dastrup, Command Historian, subj: Coordination of 1999 USAFACFS Annual Command History, 3 Apr 00, Doc II-52. See LTC Britt E. Bray and Maj William M. Raymond, Jr., "Redleg Mentor Program: Sharpening the Sword, Nurturing the Spirit," Field Artillery, Mar-Apr 99, pp. 10-11, Doc II-52A, for a good

discussion on mentoring, which was an essential aspect of the Field Artillery Officer Basic Course.

As the Director of the Gunnery Department, Colonel Thomas G. Waller, Jr., explained, modular instruction and testing formed the heart of FAOBC in 1999. The department divided FAOBC into four modules: the core module of mandatory U.S. Army Training and Doctrine Command subjects, leadership, training management, and ethics; the platoon leader module with foundational subjects on the aiming circle and maintenance; the fire direction module; and the fire support module. Each module had a series of practical exercises and culminated with a final examination. The School required the student to achieve a passing module grade, while striving to pass every graded examination. From the director's perspective the old system of test/fail/retrain/retest set the conditions for the students to fail because they could not keep up once they had failed a particular examination. Under the new system, which had the same standards as the previous, the failure rate dropped from three percent in Fiscal Year 1994 to less than one percent in Fiscal Year 1998.[49] Based upon the standards, the three-phase course, and the declining failure rate, Colonel Waller concluded, "We . . . believe that we are providing [producing] LTs [Lieutenants] who are technically and tactically proficient, primarily in the skills required for the first jobs they will face out there [in their first unit."[50]

## CAPTAIN PROFESSIONAL MILITARY EDUCATION/ FIELD ARTILLERY CAPTAIN CAREER COURSE

In 1998-1999 the U.S. Army Field Artillery School completed phasing in reforms of its Field Artillery Officer Advance Course (FAOAC) as part of the U.S. Army Training and Doctrine Command's (TRADOC) Captain Professional Military Education (CPT PME) effort. Over a period of several years, TRADOC slowly transitioned from its two-course CPT PME that consisted of the Officer Advance Course (OAC) at various service schools, such as the Field Artillery School, and the Combined Arms Services Staff School (CAS3) at Fort Leavenworth, Kansas, for a single course. TRADOC shortened CAS3 from nine to six weeks in 1996, directed the synchronization of OAC completion dates with CAS3 start dates in 1997, reduced the OAC from twenty to eighteen weeks in 1998, and renamed it the Captains Career Course the same year.[51]

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[49]Briefing, subj: Field Artillery Officer Basic Course, 1999; Memorandum for Record, subj: FAOBC, 17 Mar 00; Memo, Rowzee to Dastrup, subj: Coordination of 1999 USAFACFS Annual Command History, 3 Apr 00.

[50]Ibid. Also see: Memorandum for Record, subj: FAOBC, 17 Mar 00, for background information.

[51]MAJ David W. Cavitt and Melvin R. Hunt, "Captains

Professional Military Education: New Technology for the New Millennium," Field Artillery, Nov-Dec 99, pp. 11-13, Doc II-53; Briefing, subj: FA CCC, 12 Nov 99, Doc II-54.

As the Fire Support and Combined Arms Department that had proponency for Field Artillery Captains Career Course (FACCC) explained in November 1999, Field Artillery captains and senior first lieutenants went through an eighteen-week course that afforded the last field artillery specific training for captains and lieutenants before attending CAS3 and the U.S. Army Command and General Staff College at Fort Leavenworth, Kansas, and that ran seven times a year. The officers made a permanent change of station (PCS) move to the Field Artillery School and received the equivalent of two-weeks of common core instruction and sixteen weeks of branch tactical, technical, and warfighting instruction. After large-group instruction that lasted the first seven weeks, the students moved into a six-block small group instruction portion for eleven weeks under small group leaders from the U.S. Army, the U.S. Marine Corps, or allied officers from Great Britain, Australia, or Canada. After completing the eighteen weeks at Fort Sill, the officers moved in a TDY status to Fort Leavenworth for staff process instruction and returned to Fort Sill for graduation.[52]

As it restructured the captain's career course for active component officers, TRADOC started revamping Reserve Component (RC) CPT PME to ensure currency. As of 1998-1999, most reserve component officers attended the FAOAC-RC via Army correspondence courses and one two-week active duty for training (ADT) followed by CAS3 via correspondence courses, eight inactive duty for training (IDT) periods, and one two-week active duty training period. FAOAC-RC, as a result, had serious limitations. It consisted of seventeen Army Correspondence Course Program (ACCP) courses (about two weeks of instruction) and active duty training. Officers worked through the correspondence courses on their own and then reported to the Field Artillery School for active duty training. However, the correspondence program, developed in 1927, was obsolete and provided limited training value because the students arrived at the School unprepared and required a significant amount of refresher training. Essentially, this turned the two-week active duty training period into a two-week "fire hose" course to disseminate information.[53]

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[52]Cavitt and Hunt, "Captains Professional Military Education," p. 11; Interview, Dastrup with Mel Hunt, WIDD, 26 Jan 00, Doc II-55; Fact Sheet, subj: FACCC, Apr 99, Doc II-56; "Silhouettes of Steel," Field Artillery, Nov-Dec 99, p. 32, Doc II-57; USAFAS Schedule of Classes for FY99 (Extract), 25 Sep 98, p. 3, Doc II-58; Email msg with atch, subj: Funding for CAS3 and another ARNG thing, 3 Dec 99, Doc II-59; Briefing, subj: FACCC, 12 Nov 99.

[53]Cavitt and Hunt, "Captains Professional Military Education," pp. 11-13; Email msg with atch, subj: FACCC, 9

To avoid these striking deficiencies reserve component and Army National Guard (ANG) captains could attend the resident course. Unfortunately, too many RC and ANG captains could not attend the resident Field Artillery Captain Career Course or its predecessor, Field Artillery Officer Advance Course because it was too difficult to be released from their civilian jobs for eighteen weeks.[54]

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Feb 00, Doc II-60.

[54]Cavitt and Hunt, "Captains Professional Military Education," pp. 11-13; Email msg with atch, subj: FACCC, 9 Feb 00.

Given the restrictions of FAOAC-RC and the inability of RC and ANG officers to attend resident instruction at Fort Sill, the Field Artillery School redesigned the course in 1998-1999 to eliminate the deficiencies and to support TRADOC's RC CPT PME effort that was divided into three phases. Phase one would be nonresident instruction that would be the approximate equivalent of sixteen weeks of the resident Captain Career Course instruction. Phase two would be two-week ADT followed by unit annual training. Finally, staff process training would be covered in phase three.[55]

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[55]Cavitt and Hunt, "Captains Professional Military Education," pp. 11-13.

To facilitate better instruction and learning and to support TRADOC's RC CPT PME, the School initiated work on a FACCC Distance Learning (DL) course in 1998-1999 and searched for the best way to integrate automation. After months of work that received endorsements from School, TRADOC, and National Guard Bureau officials, the School produced a strategy for FACCC-DL that would take the student two years to complete as directed by TRADOC on 6 March 1998. As outlined in a draft plan, the course would be divided into three phases and would consist of "asynchronous," "synchronous," and resident training. Asynchronous instruction (Phase IA) would employ communications technologies, such as email, multimedia data bases, and virtual libraries, would consist of common core and branch specific subjects, would be performed at the officer's own pace and location, and would be completed during the first Total Army Training System (TATS) year. Phase IB would consist of both asynchronous and synchronous instruction and would focus on communications technologies, such as desktop video teleconferencing, would enable live, real-time interaction between instructors and students, and would be completed during the first six months of the second TATS year. Both methods would use web-based, Internet-delivered methodologies with a field artillery small group leader to monitor student progress, provide assistance, and answer questions. Phase two would be done during the second six months of the second TATS year with multiple ADTs being conducted depending upon student input. It would culminate with a two-week ADT at Fort Sill and focus on application-driven exercises, while phase three would be staff process instruction that would consist of eight IDTs and a two-week ADT. As outlined in 1999, this three-phase FACCC-DL format, which was subject to changes, would prepare reserve component officers for duties as fire support officers at maneuver battalion and brigade level and duties as staff officers at field artillery battalion, division artillery, and field artillery brigade levels, and battery command.[56]

With a pilot course scheduled in FY 2001 and with full implementation scheduled in FY 2002, FACCC-DL would replace FAOAC-RC and improve training. FACCC-DL would be more intensive and challenging than FAOAC-RC and produce a more tactically and technically competent officer.[57]

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[56]Cavitt and Hunt, "Captains Professional Military Education," pp. 11-13; Draft FACCC-DL Plan, 26 Jan 00, Doc II-61; Email msg, subj: Funding for CAS3 and another ARNG Things, 3 Dec 99; Interview, Dastrup with Melvin R. Hunt, WIDD, 26 Jan 00; Email msg with atch, subj: FACCC, 9 Feb 00.

[57]Cavitt and Hunt, "Captains Professional Military Education," pp. 11-13; Memorandum for Director, WIDD, subj: Coordination of 1999 USAFACFS Annual Command History, 22

FIELD ARTILLERY PRECOMMAND COURSE

Mar 00, Doc II-61A.

Although the Commandants of the Field Artillery School, Major General Leo J. Baxter (7 June 1997-11 August 1999) and Major General Toney Stricklin (11 August 1999-present), expressed a satisfaction with the basic format of the Field Artillery Precommand Course (PCC) for field artillery battalion and brigade commanders in 1999, they recognized the need for some modifications to keep it current. Early in 1999, General Baxter noted that approximately seventy percent of the field artillery was in the reserve components, that PCC needed to take that into consideration, and that PCC should serve its customers better. In view of this, he decided to make some minor modifications and committed funding to hire a contractor to examine the course and to make recommendations for improvements. Subsequently in November 1999, General Stricklin upon looking at the emerging results of the contractor's study wanted to make the course more combat and tactics oriented. Colonels and lieutenants colonels, who were scheduled to take command, required to undergo some kind of training exercise where they did fire planning and other tasks that were conducted by fire support coordinators.[58] In addition, General Baxter added a battalion commander's panel. The School would bring in former battalion commanders and currently serving battalion commanders to match the demographics of the Precommand Course so that they could talk lieutenant colonel issues with the students.[59]

In the meantime, the contractor completed its study of the program of instruction and made its recommendations late in 1999. Like the Commandants of the Field Artillery School, the contractor recommended adding more fire support training, deleting redundant instruction, matching tasks to the audience, and providing simulation training, to name a few. When the contractor's recommendations and the Commandants' changes were implemented in the near future, the Precommand Course would be tailored to meet the demographic needs of the students and be more tactically oriented than in the past.[60]

## DEVELOPING FIELD ARTILLERY MANUALS

In 1998-1999 the Warfighter Integration and Development Directorate (WIDD) in the U.S. Army Field Artillery School continued publishing manuals to meet the needs of the Field

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[58]Interview, Dastrup with LTC Michael T. Dooley, Dep Dir, FSCAOD, 18 Jan 00, Doc II-62; Briefing, subj: PCC Contract POI Review, 13 Jan 00, Doc II-63; Email msg with atch, subj: Precommand Course, 8 Feb 00, Doc II-64.

[59]Interview, Dastrup with Dooley, 18 Jan 00; Email msg with atch, subj: Precommand Course, 8 Feb 00.

[60]Interview, Dastrup with Dooley, 18 Jan 00; Briefing, subj: PCC Contract POI Review, 13 Jan 00.

Artillery. Knowing that getting the completed manuals to field was critical, WIDD obtained end-of-year money in 1998 to hire contractors to write Field Manual (FM) 6-70 (Tactics, Techniques, and Procedures [TTP] for M109A6 Paladin Howitzer Operations) and FM 6-20-30 (TTP for Fire Support for Corps and Division Operations). FM 6-20-30 was renamed TTP for Fire Support for Division Operations in November 1998 following a decision by the Commandant of the U.S. Army Field Artillery School that corps and division operations should be treated separately in different manuals. End-of-year funding was also used to publish XST-6-60 (TTP for Multiple-Launch Rocket System [MLRS] Operations/Command and Attack Battalion), which was renamed the Division MLRS Battalion. As of the end of 1998, WIDD planned to revise or develop eleven field manuals in 1999-2000 with ten of them under contract and one to be written by the Doctrine Branch in WIDD.[61]

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[61]Interview, Dastrup with B. Bielinski, Doctrine

Branch, WIDD, 20 Jan 99, Doc II-107, 1998 USAFACFS ACH; Memorandum for Record, subj: Doctrinal Manual Update, 20 Jan 99, Doc II-108, 1998 USAFACFS ACH; Memorandum for Commandant, USAFAS, subj: Development of Doctrinal Publications, 8 Dec 98, Doc II-109, 1998 USAFACFS ACH; Memorandum for Cmdt, USAFAS, subj: Renaming the Command and Attack Battalion, 20 Oct 98, Doc II-110, 1998 USAFACFS ACH; Memorandum for Director, WIDD, subj: Coordination of 1998 USAFACFS Annual Command History, 15 Mar 99; Interview, Dastrup with B. Bielinski, Doctrine Branch, WIDD, 1 Feb 00, Doc II-65; Fact Sheet, subj: Field Manual Update, Apr 99, Doc II-66; Briefing, subj: Field Artillery Doctrine, 17-18 May 99, Doc II-67.

In 1999 the Doctrine Branch in WIDD managed writing or revising eleven field manuals, two experimental force special texts to support digital operations, and one special text. As in 1998, the branch faced the challenge of publishing doctrine because of the lack of funding. Fortunately, the Commandant of the Field Artillery School, Major General Leo J. Baxter, provided end-of-year money of approximately $825,000 to publish doctrinal manuals, as did his successor, Major General Toney Stricklin. General Stricklin furnished funds for publishing XST-6-20-10 (TTP for Targeting for the First Digital Division), XST-6-70 (TTP for Paladin Operations in the First Digital Division), and ST 6-3-1 (TTP for the Advanced Field Artillery Tactical Data System A98) for the 4th Infantry Division, which was being digitized.[62]

Of the field manuals, completing FM 6-20 (Fire Support in Combined Arms Operations), which was last published in May 1988, proved to be the most challenging. In 1996-1997 Joint Publication 3-09 (Doctrine for Joint Fire Support) generated inter-service debates over definitions and other critical issues. In the meantime, the U.S. Army Command and General Staff College at Fort Leavenworth, Kansas, rewrote FM 100-5 (Operations) and introduced new ideas and terms in the manual. Together, Joint Publication 3-09 and the Command and General Staff College effort with FM 100-5 caused work on FM 6-20 to stop in 1997. Writers in WIDD had to wait for the other publications to be completed before continuing with FM 6-20 because the field artillery manual had to be in line with the thinking of the other two.[63]

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[62]Fact Sheet, subj: Field Manual Update, Apr 99; Interview, Dastrup with B. Bielinski, Doctrine Branch, WIDD, 1 Feb 00.

[63]Memorandum for Cmdt, USAFAS, subj: Renaming the

Command and Attack Battalion, 20 Oct 98.

Efforts writing FM 6-20 met with mixed results in 1998. In May 1998 the Joint Chiefs of Staff officially approved JCS Publication 3-09. Meanwhile, a final draft of FM 100-5 was completed in August 1997. Yet, debates over terms and content of FM 100-5 continued into 1998 and 1999 to prevent Department of the Army approval of FM 100-5 and forced another major rewrite to be done in 1999. Because FM 6-20 was dependent upon FM 100-5, the Field Artillery School had to wait for further writing until the latter would be completed in 2000.[64]

## NEW EQUIPMENT TRAINING

### Multiple-Launch Rocket System (MLRS) Training

As early as 1991, the Army's worldwide contingency strategy mandated deploying, fighting, and winning even though the active component (AC) force structure was shrinking as part of the reduction of military forces after the Cold War. This placed a greater reliance upon the reserve components (RC) -- U.S. Army Reserve (USAR) and U.S. Army National Guard (ARNG) -- to augment the active component than ever before. In view of this situation, the success of 1st Battalion, 158th Field Artillery Regiment (MLRS) of the Oklahoma Army National Guard in Operation Desert Storm in Southwest Asia in 1991, and the need to remove the obsolete 8-inch self-propelled howitzer from the inventory, the Army developed a MLRS transition program. It involved converting Army National Guard field artillery units from the 8-inch self-propelled

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[64]Interview, Dastrup with B. Bielinski, Doctrine Branch, WIDD, 20 Jan 99; Interview, Dastrup with B. Bielinski, Doctrine Branch, WIDD, 1 Feb 00; Email msg with Atch, subj: Trip Report from Semi-Annual Army Doctrine Conference, 26 May 99, Doc II-68.

howitzer to the MLRS.[65]

[65] 1994 USAFACFS ACH, p. 57; 1995 USAFACFS ACH, p. 69.

Early in the 1990s, the Gunnery Department in the U.S. Army Field Artillery School (USAFAS) designed a four-phase MLRS training strategy to move an Army National Guard battery from individual qualification through battery certification over a period of three years. The strategy permitted sufficient latitude within each phase to tailor the training to the specific requirements of the unit. During phase one, National Guard soldiers underwent common task skill training in communications, map reading, and drivers training at their home station during inactive duty (IDT) weekend drills. Phase one established the foundation for all future training, had to be completed before the soldiers went to Fort Sill for military occupational skill (MOS) hands-on training conducted by New Equipment Training Detachment (NETD) instructors in the Gunnery Department, and used Fort Sill's Televised Network Training (TNET) to conduct a portion of the training via distance learning at home station. During phase two, soldiers attended MOS 13M (MLRS Crewman) and MOS 13P (MLRS Fire Direction Specialist) course training, while leaders attended a two-week MLRS Cadre course. The Gunnery Department designed phase two to be conducted at Fort Sill or the home station by NETD instructors during the National Guard's two-week annual active duty training (ADT) time with the exception of MOS 13P, which lasted three weeks. Normally, phase two was conducted during the first summer that a unit converted to MLRS. Upon completion of the courses, the soldiers received their new MOSs.[66]

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[66]1997 USAFACFS ACH, pp. 35-36; Memorandum for AC, USAFAS, subj: MLRS New Equipment Training Overview, Summer 98, 21 Sep 98, Doc II-64, 1998 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History

The next two phases entailed collective training. Phase three consisted of section- and platoon-level training during monthly drills and annual training at a local training area or a nearby army post during the second annual training period after the conversion. Held during the third annual training period after the conversion, phase four or the final phase provided battery-level training and certification.[67]

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(ACH); Briefing, subj: MLRS 3x6 New Equipment Training Concept, Nov 98, Doc II-65, 1998 USAFACFS ACH; "Ft. Sill Soldiers Train Guard," MLRS Dispatch, 3rd Quarter 1998, p. 3, Doc II-66, 1998 USAFACFS ACH; CPT Lawrence T. Hall, Jr., and CPT Michael A. Sharp, "MLRS NET for the ARNG," Field Artillery, Mar-Apr 96, pp. 44-45, Doc II-67, 1998 USAFACFS ACH; Memorandum for Record, subj: SME Comments on MLRS NET, 24 Feb 99, Doc II-68, 1998 USAFACFS ACH.

[67] 1996 USAFACFS ACH, p. 62; 1997 USAFACFS ACH, p. 36; Memorandum for AC, USAFAS, subj: MLRS New Equipment Training Overview, Summer 98, 21 Sep 98.

Using the four-phase transition program, the Gunnery Department trained five National Guard battalions since the transitions had begun early in the 1990s. Unlike other NETDs that had trained battalions from Oklahoma, Michigan, Tennessee, and Kentucky and were composed of entirely AC personnel, the one that trained with the 3-116th Field Artillery of the Florida Army National Guard in 1997 and 1998 consisted of AC and four Army National Guard personnel with the express purpose of getting the latter qualified to be instructors in MLRS courses.[68] The 3-116th Field Artillery completed phase four training in the summer of 1998 with battery-level certification conducted by the 1st Battalion (MLRS), 4th Cavalry Brigade of Fort Stewart, Georgia.[69]

Meanwhile in cooperation with the Gunnery Department, the 1-142nd Field Artillery of the Arkansas Army National Guard conducted an alternative NET plan to expedite training because of an accelerated fielding schedule that would have the unit's launchers fielded by 1997. Although the Gunnery Department dispatched NETD instructors on temporary duty to Fort Chaffee,

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[68]Unfortunately, of the four National Guard personnel employed to help train the Florida unit, a captain moved onto a new position, while a sergeant became a state recruiter. See Memorandum for Record, subj: SME Comments on MLRS NET, 24 Feb 99.

[69]1997 USAFACFS ACH, pp. 36-37; Briefing (Extract), subj: Standards Start Here, 20 Jul 99, Doc II-69; Briefing, subj: Standards Start Here, 1999, Doc II-70; Memorandum for AC, USAFAS, subj: MLRS New Equipment Training Overview, Summer 98, 21 Sep 98.

Arkansas, on weekends and during annual training periods to train 1-142nd Field Artillery instructors during phase three in 1997, the department did not provide a dedicated New Equipment Training Detachment to the Arkansas unit. The Florida new equipment training detachment supported the conversion training during annual training in 1998. Although the Gunnery Department had to rely upon internal personnel resources because budget restraints prevented TRADOC from providing them as it had done in the past, the alternative plan accomplished its goal. At the end of Fiscal Year (FY) 1998, the Arkansas unit was on the same training schedule as the units from Kansas and South Carolina and had received eighteen launchers. All three National Guard units were scheduled to complete training and certification in FY 1999 with 1-147th Field Artillery of South Dakota to be finished in FY 2000.[70]

[70]1997 USAFACFS ACH, pp. 36-37; Memorandum for AC, USAFAS, subj: MLRS New Equipment Training Overview, Summer 98, 21 Sep 98, 1998 USAFACFS ACH; Briefing, subj: MLRS 3x6 New Equipment Training Concept, Nov 98.

Looking into the near future, the Gunnery Department knew that equipment and funding resources would require revamping MLRS conversion training. At the direction of the Assistant Commandant of the Field Artillery School, the department outlined a three-phase conversion training plan of two years in November 1998. Phases one and two focused on individual training of soldiers to make the transition to MLRS, while phase three developed the unit's ability to fight with the new system. More specifically, as directed by the Chief of Staff of the Army, General Dennis J. Reimer, in a memorandum on 8 June 1998 and supported by the Assistant Commandant of the Field Artillery School, Brigadier General Lawrence R. Adair, phase one would be conducted by NETD instructors via distance learning using computers, CD ROM, video teletraining, the Internet, or other emerging technologies to save money and time. The phase would take place over a period of one year during weekend drills to produce MOS-qualified soldiers. Phase two would be taught by NETD instructors at Fort Sill or at the unit's home station during the first summer (annual training) after the unit had converted to MLRS using the equipment, while phase three would be conducted during monthly drills and annual training during the second year after the conversion and would provide platoon training employing NETD instructors. Once phase three had been completed, the NETD team would be reassigned or disbanded. At this point the unit would assume responsibility for battery/battalion training and certification that would be completed during the third summer (annual training) after the conversion and during weekend drills. Although the unit had the primary responsibility for training and certification, other Army National Guard units, U.S. Army Forces Command training support battalions, and mobile training teams from the Gunnery Department could provide assistance as available.[71]

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[71] Interview with atch, Dastrup with CPT Chuck Akin, MLRS Division, Gunnery Department, 17 Feb 00, Doc II-71;

Memorandum for Deputy Director of Combat Developments, subj: MLRS New Equipment Transition and Certification Support, 25 Feb 99, Doc II-72; Briefing, subj: MLRS 3x6 New Equipment Training Concept, Nov 98; Memorandum for Deputy Assistant Commandant-ARNG, subj: MLRS NET Overview, Fall 1999, 7 Dec 99, Doc II-73; Memorandum for Record, subj: MOS and Collective Training, 17 Feb 00, Doc II-74; Position Paper, subj: MLRS NET, 4 Feb 00, Doc II-75; Briefing (Extract), subj: Standards Start Here, 20 Jul 99; Briefing, subj: Standards Start Here, 1999.

To satisfy the new, three-phase training plan that was implemented and would be employed to train National Guard units in South Dakota and North Carolina in 1999, the Gunnery Department outlined two options.[72] The first option basically preserved the status quo and depended upon three eight-person, all-military teams to conduct the training during phases two and three. While the second option retained the eight-person team for phases two and three, it provided a significant departure from the past. It recommended using two noncommissioned officers and six contract instructors, whereas previous teams had consisted solely of military personnel. Although the costs for each option were basically the same over the six-year fielding period of FY 1999-2005, the second freed up military personnel and reduced personnel turbulence in MLRS units. In a briefing to the Deputy Chief of Staff for Operations for the Army, the Chief of the Fire Support Division in the Gunnery Department advised selecting option two based upon the Assistant Commandant's guidance because it would save personnel and reduce personnel turbulence. In view of this, the Deputy Chief of Staff for Operations approved option two for implementation because the Army could not afford to continue taking eight to ten people from a unit when unit manning was in trouble. Funding contractors was a small price to pay for unit stability.[73]

In 1999 the Gunnery Department employed NETD teams composed of six civilian contract instructors and two noncommissioned officers for the first time to conduct the three-phase training program designed in 1998. Headquartered in Sioux Falls, South Dakota, the 1-147th Field Artillery began conversion training in 1998 and went through phase two in 1999. In the meantime, the 2-147th Field Artillery of Watertown, South Dakota, went through phase one via distance learning and completed phase two in June 1999, and the 5-113th Field Artillery of Lewisburg, North Carolina, completed phase one via distance learning and phase two through hands-on training at Fort Sill.[74]

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[72]Memorandum for Record, subj: MOS and Collective Training, 17 Feb 00; Position Paper, subj: MLRS NET 4 Feb 00; Memorandum for Deputy Assistant Commandant-ARNG, subj: MLRS NET Overview, Fall 1999, 7 Dec 99.

[73]Briefing, subj: MLRS 3x6 New Equipment Training Concept, Nov 98; Msg, MAJ Hugo Fischer, GD, to Dr. Boyd L. Dastrup, Command Historian, subj: 98 Historical Info Request, 15 Jan 99, Doc II-69, 1998 USAFACFS ACH; Memorandum for Deputy Assistant Commandant-ARNG, subj: MLRS NET Overview, Fall 1999, 7 Dec 99; Memorandum for Record, subj: MOS and Collective Training, 17 Feb 00.

[74]Memorandum for Assistant Commandant, USAFAS, subj:

SIGACTS, 15 Jan 99, Doc II-76; Memorandum for Record, subj: MOS and Collective Training, 17 Feb 00; Memorandum for Deputy Assistant Commandant-ARNG, subj: MLRS NET Overview, Fall 1999, 7 Dec 99; Memorandum for Assistant Commandant, USAFAS, subj: SIGACTS, 12 Oct 99, Doc II-77; Memorandum for Director of Combat Developments, subj: Distance Learning and New Equipment Training to Support MLRS New Equipment Transition and Certification, Phase III North Carolina and South Dakota and Phase I Texas and Arkansas, 11 Jan 00, Doc II-78; Memorandum for Assistant Commandant, USAFAS, subj: SIGACTS, 12 Jan 00, Doc II-79.

In the fall of 1999 after going through distance learning during phase one, Captain Robert F. Markovetz, Jr., of the 2-147th Field Artillery reflected upon the effectiveness of distance learning. Traditionally, a soldier signed up for a correspondence course, waited several weeks for the course material to show up, completed the course, returned it for grading, and then waited for the grade. Rather than spending several weeks on correspondence courses, phase one training with its focus on distance learning through video training and CD ROMS permitted the soldier to go through the training without long waits. The CD ROM instruction provided a multimedia presentation to the soldiers and allowed them to score the practical exercises as they worked, while the video training permitted the soldiers to ask a MOS-qualified instructor questions on the material covered in the CD ROMs. Although weaknesses existed that required correcting, distance learning functioned well and was the wave of the future because it saved money, enabled a large number of soldiers to train for a moderate expense, and saved time and travel.[75]

**Paladin M109A6 Self-propelled 155-mm. Howitzer New Equipment Training**

Beginning in 1993, the Paladin Division, Gunnery Department, U.S. Army Field Artillery School (USAFAS) initiated new equipment training (NET) for the Paladin that was being introduced into the inventory to replace the M109A2/A3/A5 155-mm. self-propelled howitzer. In 1993-1994 the Paladin New Equipment Training Team provided maintenance and operator new equipment training to active component units at Fort Sill, Oklahoma, Fort Stewart, Georgia, and Fort Benning, Georgia. In 1995 the new equipment training team trained the 3rd Armored Cavalry Regiment (ACR) at Fort Bliss, Texas; the 1-3rd Field Artillery (redesignated 4-2), 2nd Armored Division (redesignated 4th Infantry Division), Fort Hood, Texas; and observer controllers at the National Training Center, Fort Irwin, California. However, the drawdown and the budget reduction had a significant influence upon the training. In previous years a new equipment training team had fifty-four people for maintenance and operator training, trained the entire battalion during a period of four weeks, and had the ability to field a battalion of twenty-four howitzers at a time. After arriving on site, the team, led by a lieutenant colonel, divided into three battery teams, one maintenance team, and one headquarters team to train individual and unit skills.[76]

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[75]CPT Robert F. Markovetz, Jr., "Distance Learning: MLRS 3x6 Conversion for the Army National Guard," Field Artillery, Sep-Oct 99, pp. 42-43, Doc II-80.

[76]"New Equipment Training for Paladin--The Future Is

Now!" Field Artillery, Feb 93, pp. 51-53, Doc II-70, 1998 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH); LTC Sidney E. Riley, "Paladin NET Lessons for Those Who Follow," Field Artillery, Apr 94, pp. 15-17, Doc II-71, 1998 USAFACFS ACH; Staff Directory (Extract), 15 Jun 93, p. 5, Doc II-72, 1998 USAFACFS ACH.

Although this training strategy worked well, the drawdown and budget cuts of 1995 forced the team's size to be reduced from fifty-four to twenty-six people, and this changed the instructor-student ratio from one to three to one to six. In view of this personnel cut, the Gunnery Department had to revamp its training plan by devising a six-week training schedule. Rather than training an entire battalion at one time, the team conducted organizational and direct support maintenance training for the mechanics during the first two weeks. In October 1995 the Department turned maintenance training over to the contractor when the 1-3rd Field Artillery (reflagged 4-42nd since) at Fort Hood began new equipment training. In the third week the team provided operator training for the leaders; and in the fourth week they trained the operators. During the last two weeks of training, the NET team conducted collective training and concluded it with intensive battery field exercises and battery and battalion dry- and live-fire exercises. This new training strategy essentially provided a two-phase new equipment training program for the Paladin by the end of 1995. While the contractor furnished two weeks of maintenance new equipment training, the Gunnery Department supplied four weeks of operator new equipment training. Judged by the Chief of the Paladin New Equipment Training team, the new arrangement worked well and provided solid maintenance and operator training.[77]

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[77]1996 USAFACFS ACH, pp. 64-65; Msg, subj: Paladin

NET-Reply, 27 Jan 99, Doc II-73, 1998 USAFACFS ACH; Fact Sheet, subj: Paladin Fieldings, 29 May 98, Doc II-74, 1998 USAFACFS ACH; Interview, Dastrup with MAJ Jeffrey A. Taylor, Chief, Paladin Division, GD, 16 Feb 96, Doc II-75, 1998 USAFACFS ACH; Memorandum for Cdr, 4-42 FA, subj: Final Report on Paladin NET Team Fielding, 10 Jan 96, Doc II-76, 1998 USAFACFS ACH; Interview, Dastrup with MAJ Hall, Paladin Division, GD, 15 Jan 97, Doc II-77, 1998 USAFACFS ACH.

In the midst of training the active component in 1996-1997 with the two-phase program, the Army recognized that training the Army National Guard would be difficult and would require additional personnel and turned to the National Guard Bureau for assistance.[78] To facilitate National Guard Paladin fieldings that would begin in 1997 just as active component unit fieldings were being completed and continue through 2001, the National Guard Bureau announced the creation of thirty Title 10 Active Guard Reserve (AGR) positions for the M109A6 Paladin NET team on 15 August 1996. The Bureau wanted three officers and twenty-seven noncommissioned officers to serve as instructor-writers and to become subject matter experts, who could be used by their respective states after their tour on the NET team had been completed. Once on board early in 1997, the National Guard NET team gave the Field Artillery School a second NET team. In keeping with the Total Force concept, the Field Artillery School integrated Army National Guard personnel with active component people beginning on 1 January 1998. By February 1998 two trained Paladin NET teams existed. Both were composed of Army National Guard and active component personnel with no distinction being made between the two components.[79]

In 1998 fielding efforts continued. During the year, the Gunnery Department's two NET teams finished fielding the Paladin to the active component employing the two-phase training program composed of contractor-furnished maintenance new equipment training and Gunnery Department-provided operator new equipment training. The Gunnery Department completed training active component field artillery units in Germany, Fort Riley, Kansas, and Fort Lewis, Washington.[80]

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[78]1997 USAFACFS ACH, p. 38; Fact Sheet, subj: Paladin Fieldings, 29 May 98; Memorandum for Cdr, 2-82nd FA, subj: Paladin NET Final Report, 14 Aug 96, Doc II-78.

[79]1997 USAFACFS ACH, pp. 38-39; Memorandum for Operations, GD, subj: Bi-weekly SIGACTS, 11 Feb 98, Doc II-79, 1998 USAFACFS ACH; Memorandum for Operations, GD, subj: Bi-weekly SIGACTS, 2 Dec 97, Doc II-80, 1998 USAFACFS ACH; Email msg with atch, subj: Paladin NET, 6 Mar 00, Doc II-81.

[80]Briefing, subj: Paladin NET Overview, 1998, Doc II-81, 1998 USAFACFS ACH; Interview, Dastrup with LTC William P. Troy, Chief, Paladin Division, GD, 26 Jan 99, Doc II-82, 1998 USAFACFS ACH; Memorandum for Cdr, 1/37 FA, subj: Paladin NET Final Report, 3 Dec 97, Doc II-83, 1998 USAFACFS ACH; Memorandum for Cdr, 1/6 FA, and Cdr, 1/7 FA, subj: Paladin NET Final Report, 12 May 98, Doc II-84, 1998 USAFACFS ACH; Memorandum for Cdr, 2/3 FA, subj: Paladin NET Final Report, 3 Aug 98, Doc II-85, 1998 USAFACFS ACH;

Memorandum for Cdr, 1/5 FA, subj:  Paladin NET Final Report, 10 Oct 98, Doc II-86, 1998 USAFACFS ACH; Memorandum for Cdr, 4/1 FA, subj:  Paladin NET Final Report, 20 Nov 98, Doc II-87, 1998 USAFACFS ACH; Memorandum for Cdr, 1/127 FA, KSARNG, subj:  Paladin NET Final Report, 30 Jun 98, Doc II-88, 1998 USAFACFS ACH; Memorandum for Cdr, 1/214 FA, GAARNG, subj: Paladin NET Final Report, 1 Aug 98, Doc II-89, 1998 USAFACFS ACH; Fact Sheet, subj:  Paladin Fieldings, 29 May 98.

Fieldings with the Army National Guard field artillery battalions in 1997-1998, meanwhile, illustrated the challenges the two-phase plan to train such units. Because Army National Guard personnel were not available on a continuous basis as their counterparts in active component units were, the Gunnery Department revised its two-phase training program of four weeks. In cooperation with the Paladin Program Manager, the Paladin Division in the Gunnery Department designed a three-phase training program in 1997 to train a unit over a period of one year. Concurrent with contractor-furnished maintenance new equipment training, Gunnery Department new equipment training teams furnished operator new equipment training in three phases. During phase one, unit leaders went through an eighty-hour Paladin Cadre Course at Fort Sill. Phase-two training took place during the unit's weekend training drills at home station and lasted ten months. Phase-three training conducted by a team of twenty-six NET personnel occurred during a three-week annual training period (two weeks is the norm) and culminated with live-fire exercises to qualify the newly-equipped units with the required skills to employ the Paladin properly. In 1998-1999 the new equipment training teams completed all three phases of training with the 1-127th Field Artillery of the Kansas Army National Guard, the 1-214th Field Artillery of the Georgia Army National Guard, the 1-114th Field Artillery of the Mississippi Army National Guard, the 1-126th Field Artillery of the Wisconsin Army National Guard, the 4-178th Field Artillery of the South Carolina Army National Guard, the 1-201st Field Artillery of the West Virginia Army National Guard, the 1-202nd Field Artillery of the New Mexico Army National Guard, and the 2-222nd of the Utah Army National Guard. In 1999 the Gunnery Department anticipated completing NET training for six Army National Guard units in 2000 and four in 2001.[81]

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[81]Memorandum with Encl for Dir, GD, et al, subj:

Paladin New Equipment Training, 14 Dec 98, Doc II-90, 1998 USAFACFS ACH; Briefing, subj: Paladin NET Overview, 1998; Msg, subj: Paladin NET-Reply, 27 Jan 99; Memorandum for Record, subj: Annual History Input, 23 Feb 99, Doc II-91, 1998 USAFACFS ACH; MAJ Kerry J. Loudenslager, "ARNG Paladin NET: Helping Units Help Themselves," Field Artillery, Sep-Oct 99, pp. 44-45, Doc II-82; Memorandum for Record, subj: MFCS Cross Reference to Paladin Fieldings, 25 Feb 00, Doc II-83; Interview, Dastrup with LTC Kerry J. Loudenslager, Chief, Paladin Division, GD, 2 Mar 00, Doc II-84; Email msg, subj: Paladin NET, 6 Mar 00, Doc II-85; Email msg with atch, subj: Paladin NET, 6 Mar 00.

In the meantime, the Gunnery Department reviewed its new equipment training strategy early in 1998 because the U.S. Army extended Paladin fieldings into Fiscal Year (FY) 2001. This action by the U.S. Army created a problem. As of March 1998, existing active component personnel dedicated to new equipment training were programmed to continue through FY 2000. Given the personnel programming, extending the fielding of the Paladin would create a personnel shortage and degrade training at the same time because the current new equipment training strategy, based upon two complete teams, provided the minimal required level of training. To furnish the necessary training the Gunnery Department prepared five courses of action and presented them to the Assistant Commandant of the Field Artillery School. Of the five alternatives the Department recommended extending both active component and Active Guard Reserve new equipment teams through FY 2001 because it would preserve the existing fielding strategy and allow for more flexibility than the others did to adapt to potential changes in the fielding schedule, even though it required U.S. Army Training and Doctrine Command (TRADOC) and National Guard Bureau approval. The Assistant Commandant concurred with the recommendation and sent it through the chain of command for approval. TRADOC approval came on 13 July 1998, and the Director of the National Guard Bureau, Major General Roger C. Schultz, approved on 9 November 1998.[82]

[82]Interview, Dastrup with Troy, 26 Jan 99; Msg with Encls, subj: Paladin Staff Study, 28 Jan 99, Doc II-92, 1998 USAFACFS ACH; Msg, subj: Paladin NET-Reply, 1 Feb 99, Doc II-93, 1998 USAFACFS ACH; Msg, subj: NGB Approval of Extending NET Resources, 1 Feb 99, Doc II-94, 1998 USAFACFS ACH; Email msg with atch, subj: Paladin NET, 6 Mar 00.

Although the Gunnery Department received approval for extending its Paladin NET teams, it faced another hurdle in 1999 associated with fielding Paladin. The three-phase training program initiated in 1998 worked well, but it was expensive during an era of declining resources because the Department had to send eight-person teams on temporary duty to Army National Guard units during phase two. To reduce costs during the phase, the Department began exploring the possibility of using distance learning. According to projections, this would cut costs for the Department and provide more training time. Equally important, distance learning had the potential of reducing the three-week annual training period presently required to two-weeks and save money for the National Guard Bureau that paid for the additional one week of annual training. One critical obstacle presented the possibility of lessening the impact of distance learning. Many Army National Guard units did not have access to distance learning facilities and would have to travel. Although distance learning offered several key advantages over sending teams on temporary duty, approval to use it would not come until 2000.[83]

# CHAPTER THREE
# COMBAT DEVELOPMENTS:
# FORCE DESIGN, DOCTRINE, AND EQUIPMENT REQUIREMENTS

## INTRODUCTION

During 1999, the U.S. Army Field Artillery School pursued key initiatives to make the Field Artillery more lethal, deployable, and responsive to meet future requirements. To do this the School developed doctrine, tactics, techniques, and procedures; made significant progress towards introducing new equipment and weapons; participated in the Transformation of the Army effort; and took steps to counter the perception that the Field Artillery was walking away from the close fight.

## FORCE DESIGN AND DOCTRINE

### Transformation of the Army

Early in 1999, the Kosovo deployment in Eastern Europe highlighted several critical shortcomings in the Army. While the heavy forces were too heavy, took too long to deploy, and were too difficult to maneuver in areas of the world where they might have to operate, the light forces were too light and lacked staying power and lethality if they were deployed into an environment where they might face an armored threat. Also, future opponents would not give the American military

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[83]Interview, Dastrup with Loudenslager, 2 Mar 00; Email msg with atch, subj: Paladin NET, 6 Mar 00.

a long lead time to deploy and would attempt to deny air strips and ports that the United States traditionally depended upon to deploy military forces.[1]

[1]Email msg with atch, subj: Transformation Activities in Congress, 14 Feb 00, Doc III-1; Briefing, subj: Transformation Campaign Plan, 19 Jan 00, Doc III-2; The Brigade Combat Team Organizational and Operational Concept, 6 Jan 00, p. 4, Doc III-3.

Upon becoming the Chief of Staff of the Army in mid-1999, General Eric K. Shinseki articulated a clear vision for the Army to eliminate the deficiencies underscored by Kosovo and to make it more relevant to future warfare. In June 1999 the General explained that the Army aspired to be the most respected army in the world and the most feared ground force to those who would threaten the vital interests of the United States. To do this the Army had to improve its strategic responsiveness, to develop a clear long-term strategy to improve operational jointness, to implement the goals of Joint Vision 2010, to produce leaders for joint warfighting, to complete the full integration of the active and reserve components, to staff its warfighting units, and to provide for the well-being of its soldiers, civilians, and family members.[2]

Although each of the goals was critical, General Shinseki focused his energies on strategic responsiveness in 1999. From the General's vantage point, the world situation demanded a strategically responsive Army that was capable of operating throughout the range of conflict and that was more versatile, lethal, and survivable than ever before. The Army had to provide early entry forces that could operate jointly without access to fixed forward bases and had the power to slug it out and win campaigns decisively. Continuing, the General noted, "At this point in our march through history, our heavy forces

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[2] Intent of the Chief of Staff, Army, 23 Jun 99, Doc III-4; Email msg with atch, subj: CSA Expands on Presentation to AUSA in Oct, 1 Feb 00, Doc III-5; Email msg, subj: Initial Bde--Historical Reporting, 22 Dec 99, Doc III-6; Briefing, subj:  Transformation Campaign Plan, 19 Jan 00.

are too heavy and our light forces lack staying power. Heavy forces must be more strategically deployable and more agile with a smaller logistical footprint, and light forces must be more lethal, survivable, and tactically mobile."[3]

[3]Intent of the Chief of Staff, Army, 23 Jun 99.

Over the next several months General Shinseki further refined his vision. In August 1999 General Shinseki's Army of the future effort included lighter, more deployable forces and equipment and outlined standing up two initial brigade combat teams (IBCT) at Fort Lewis, Washington, to serve as a test bed for new ideas, force structure, weapons, and equipment. Testing off-the-shelf tracked and wheeled vehicles that appeared to offer the desirable characteristics would compose a major component of the IBCT effort and would give the endeavor a quick start.[4] In a U.S. Army news release of 12 October 1999, the General along with Secretary of the Army Louis Caldera further elucidated his vision. The Army required the capability of deploying a independent combat brigade anywhere in the world within 96 hours, a division within 120 hours, and 5 divisions within 30 days. This meant transforming the Army into a more dominant and strategically responsive force.[5] "To this end," he told the attendees of the 45th Annual Meeting of the Association of the United

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[4]Email msg with atch, subj: Information Paper, 6 Jan 00, Doc III-7; Briefing, subj: Transforming the World's Best Army into a Full Spectrum Force. . .Strategically Responsive and Dominant, 10-11 Jan 00, p. 3, Doc III-8; The Brigade Combat Team Organizational and Operational Concept, 6 Jan 00, p. 6; Briefing, subj: Brigade Combat Team Fire Support, Jan 00, p. 10, Doc III-9.

[5]"Army Announces Vision for the Future," U.S. Army News Release, 12 Oct 99, Doc III-10.

States Army on 12 October 1999, "we will begin immediately to turn the entire Army into a full spectrum force which is strategically responsive and dominant at every point on the spectrum of operations."[6] As the Director of the Transformation Axis at Headquarters, U.S. Army Training and Doctrine Command (TRADOC), Colonel Joseph Rodriguez, and the Director of Battle Laboratory Integration, Technology, and Concepts at TRADOC, Colonel Michael Mahaffey, noted in December 1999, General Shinseki wanted to make the heavy forces lighter and the light forces heavier with the objective of erasing the distinction between the two.[7]

[6]GEN Eric K. Shinseki, Address to the Eisenhower Luncheon, 45th Annual Meeting of the Association of the United States Army, 12 Oct 99, Doc III-11.

[7]Briefing, subj: Status of Brigade Combat Team Development at Fort Lewis and the Planned Performance Demonstration at Fort Know, 16 Dec 99, p. 1, Doc III-12.

From General Shinseki's perspective, the Army had a bifurcated force. It had equipment, such as the M-1 Abrams tank, and divisions that had been designed for the Cold War and could not go everywhere and had light forces that lacked the lethality or survivability to be placed in the middle of a war. In view of recent combat and contingency operations in the 1990s, the Army required a totally new force structure to handle future war with combat systems with the survivability of the M-1 Abrams tank and the Bradley fighting vehicle but with the deployability of the light forces.[8]

By the end of 1999, various task forces and study groups working throughout TRADOC and the senior Army Planning Group began producing results with the transformation of the Army. According to a working draft of 17 November 1999, the preliminary design for the initial brigade combat team central to General Shinseki's vision created an independent mounted infantry organization that would rely heavily on superb reconnaissance, surveillance, and target acquisition (RSTA) abilities, would provide immediate improvements to the Army's strategic responsiveness, and would furnish the means for institutional changes across all of the domains of doctrine, training, leader development, organizations, materiel, and soldiers. The major sub-elements within the initial brigade combat team would include two motorized, combined arms infantry battalions, each with three combined arms rifle companies and a headquarters company with a reconnaissance platoon and a mortar platoon but excluded organic field artillery, air and missile defense, combat and construction engineers, and military police. As the draft working paper pointed out, embedding these kinds of units in the brigade combat team would be at the expense of responsiveness. If the brigade required such capabilities, they would be mission tailored in augmentation packages. After all, the key requirement focused on strategic and operational deployability; and existing field artillery systems were too heavy.[9] All equipment, including field artillery, had to fit on a C-130 aircraft. "If it doesn't fit in a C-130, it doesn't go into the brigade," Colonel Rodriquez emphasized on 16 December 1999.[10]

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[8]Email msg with atch, subj: CSA Expands on Presentation to AUSA in Oct, 1 Feb 00.

[9]"New Brigade Won't Feature Organic Aviation or Cannon Capabilities," Inside the Army, 29 Nov 99, pp. 1, 8, Doc III-13; Briefing, subj: Transformation Campaign Plan, 19 Jan 00; Email msg, subj: IBCT, 6 Mar 00, Doc III-14; Executive Summary, Initial Brigade Book Volume I (Extract), undated, pp. 4-5, Doc III-15.

[10]Briefing, subj: Status of Brigade Combat Team

Development at Fort Lewis and Planned Performance Demonstration at Fort Knox, 16 Dec 99, p. 2; Executive Summary, Initial Brigade Book Volume I (Extract), undated, pp. 4-5.

Yet, the working draft of the initial brigade combat team organization and early thinking about the brigade structure reflected some ambivalence concerning fire support. Although field artillery was not included in the working draft of the brigade, the designers conceded the requirement for field artillery and projected procuring a medium assault vehicle-based 155-mm. howitzer sometime in the near future. Until this occurred, the brigade would have to rely upon the High Mobility Artillery Rocket System (HIMARS) for counterfire if needed. At a briefing in the Pentagon in December 1999, TRADOC representatives pointed out that they did not know exactly what type of field artillery would be a part of the brigade in the future. For now, however, the initial brigade combat team organization would not have field artillery because it was too heavy and would detract from deployability. Yet, this would be risky because of the lack of fire support. Mortars simply could not handle indirect fire support requirements.[11]

As of November and December 1999, the Army envisioned taking a dual path over the next several years to develop a medium-weight force particularly tailored towards small-scale contingency operations. The Army planned to hold a demonstration of commercial off-the-shelf technologies in January 2000 with Canada being the primary source of the equipment to stimulate the development of doctrine,

[11]"New Brigade Won't Feature Organic Aviation or Cannon Capabilities," Inside the Army, 29 Nov 99, pp. 1, 8; Briefing, subj: Status of Brigade Combat Team Development at Fort Lewis and the Planned Performance Demonstration at Fort Know, 16 Dec 99, pp. 3, 11, 13, 15; Email msg, subj: IBCT, 6 Mar 00.

organizational design, and leader training and to establish the initial brigades. After this participants in the demonstrations would make equipment recommendations to the Army leadership with procurement hopefully beginning in July 2000 and two medium brigades being fielded in two years. In the meantime, the search for breakthrough technologies would begin as fielding the initial brigade was being done.[12]

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[12]"Tactics, Techniques, and Procedures Work on New Vision to Start Soon," Inside the Army, 29 Nov 99, pp. 8-9, Doc III-13; Briefing, subj: Status of Brigade Combat Team Development at Fort Lewis and the Planned Performance Demonstration at Fort Knox, 16 Dec 99, p. 2; Scott R. Gourley, "New Brigade Structure Begins to Emerge," Army, Feb 00, pp. 33-34, Doc III-16; Email msg with atch, subj: New Weapon Systems, 10 Jan 00, Doc III-17.

At the same time the Army outlined a three-phase development program. The two selected brigades at Fort Lewis would comprise the initial brigades, would be the prototypes for others to follow, would be equipped with off-the-shelf equipment, including vehicles, and equipment that was already in the Army's inventory and that could be adapted to meet existing requirements, and would be fielded between 2000 and 2003.[13] As TRADOC Deputy Chief of Staff for Combat Developments, Major General Dan Zanini explained late in 1999, interim brigades equipped with the medium assault vehicle technology would follow the initial brigades that would be retrofitted with the medium assault vehicle technology and would be fielded between 2003-2010. Next, the Army would

[13]Briefing, subj: Status of Brigade Combat Team Development at Fort Lewis and the Planned Performance Demonstration at Fort Knox, 16 Dec 99, pp. 1-6; Briefing, subj: Brigade Combat Team Fire Support, Jan 00, p. 7; Executive Summary, Initial Brigade Book Volume I, Fall 1999.

field the objective brigade that would be based upon breakthrough technologies and would be fielded beginning in 2010.[14]

[14]"Tactics, Techniques, and Procedures Work on New Vision to Start Soon," Inside the Army, 29 Nov 99, pp. 8-9; Briefing, subj: Status of Brigade Combat Team Development at Fort Lewis and the Planned Performance Demonstration at Fort Knox, 16 Dec 99, pp. 4-5; Briefing, subj: Brigade Combat Team Fire Support, Jan 00, p. 9; Briefing, subj: Brigade Combat Team Fire Support, Jan 00, Doc III-18.

This effort, however, came at a cost. In December 1999 the Army announced a multibillion dollar plan designed to help transform it from a Cold War force to a lighter, more flexible organization. This demanded terminating seven programs in order to find the funds. For the Field Artillery the plan loomed critical because the Army considered terminating the Crusader self-propelled 155-mm. howitzer program that had been underway for several years and consisted of a self-propelled 155-mm. howitzer and resupply vehicle with breakthrough technology. The Army deemed the Crusader self-propelled howitzer and resupply vehicle to be too heavy for the medium brigade envisioned by General Shinseki. Rather than taking this approach, the Army opted to keep the Crusader and its resupply vehicle after careful consideration but restructured it so that the two would be lighter and moved fielding back two years from 2005 to 2007 to develop the requisite technology. Equally as important, the Army terminated the Army Tactical Missile System Block IIA and the Multiple Launch Rocket System Smart Rocket. By discontinuing seven programs and restructuring Crusader and other modernization programs, the Army freed up billions of dollars to stand up its first medium-size brigade at Fort Lewis, to lease equipment from other countries, and to begin procuring medium armored vehicles as long-term solutions for the new units. As planned, the Army wanted between 380 and 527 medium armored vehicles in as many as 12 variants for each brigade. To reach the first unit equipped date of March 2001, this meant producing two vehicles a day beginning in June 2000.[15]

Yet, abolishing some programs and restructuring others failed to satisfy the need for funding from 2001 onwards. The Army remained well short of its funding goals and faced the possibility of extracting additional cuts. This had the potential, as some senior general officers observed, of reducing the number of Comanche helicopters to be procured, a top priority program that had been untouched by budget negotiations so far between the Army and the Office of the Secretary of Defense.[16] Also, discontinuing or reducing the size of certain programs overlooked the need to upgrade legacy systems, also known as Cold War systems, that would support

[15] Email msg with atch, subj: Crusader, 5 Jan 00, Doc III-19; Email msg with atch, subj: Article from DA PAO, 10 Jan 00, Doc III-20; Email msg with atch, subj: New Weapons System, 10 Jan 00; Email msg with atch, subj: Future of Heavy Systems, 6 Jan 00, Doc III-21; Email msg with atch, subj: Special Report, 4 Jan 00, Doc III-22; Email msg with atch, subj: Escalation, 14 Feb 00, Doc III-23.

[16] Email msg with atch, subj: Article from DA PAO, 10 Jan 00.

the interim and objective medium forces. The Bradley Fighting Vehicle, the Paladin Self-propelled 155-mm. Howitzer, and the other armored systems needed to be replaced or upgraded to stay current.[17]

[17]Email msg with atch, subj: Escalation, 14 Feb 00.

In the meantime, analysis by the Field Artillery School prompted reconsidering the fire support organization in the initial brigade combat team. In December 1999 the School pointed out in stark terms the vulnerability of the initial brigade combat team to counterfire and the unacceptable high casualties that it would take without organic fire support beyond organic mortars. Based upon the School's scrutiny, TRADOC revamped fire support in the initial and interim brigade combat team early in January 2000. In the initial and interim combat brigade team TRADOC made fire support teams and sections organic to the maneuver force, created a fires and effects coordination cell to coordinate fire support, and introduced target acquisition radars to both brigades. For fire support TRADOC included six HIMARS in the initial combat brigade team and eighteen medium armor vehicle-based 155-mm. howitzers in the interim brigade combat system. According to the Field Artillery School, the outlined fire support organization for the initial and interim brigades would increase the volume of fire, would provide close support and the ability to provide proactive and reactive counterfire, and would furnish shoot and scoop capabilities without sacrificing strategic and operational mobility.[18]

Placing HIMARS in the initial brigade combat team, however, assumed considerable risk and led to a crucial decision in March 2000. As of February 2000, the Army had only three prototype HIMARS located at Fort Bragg, North Carolina, and one demonstration system at the factory in Dallas, Texas, and could expect the first production systems in 2002 at the earliest. This essentially meant that there would not be any fire support in the initial brigade combat team. Faced with this situation, the Field Artillery School proposed substituting the M198 towed 155-mm. howitzer for HIMARS. At the School's recommendation General Shinseki on 3 March 2000 decided to use the towed howitzer because of the earlier decision to use off-the-shelf equipment and the requirement for organic fire support in the initial and

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[18]Briefing, subj: Transforming the World's Best Army into a Full Spectrum Force. . .Strategically Responsive and Dominant, pp. 8, 15, 18, 24, 31, 10-11 Jan 00; Briefing, subj: Brigade Combat Team Fire Support, Jan 00, pp. 11-23; Briefing, subj: Brigade Combat Team Fire Support, Jan 00; Email msg, subj: Description of Medium Armored Vehicle Variants for I-BCT, 11 Jan 00, Doc III-24; The Brigade Combat Team Organizational and Operational Concept, 6 Jan 00, pp. 23-24, 44-45; Email msg, subj: IBCT, 6 Mar 00; Organizational and Operational Concept, The Brigade Combat Team, 3 Feb 00, pp. 20, 21, 23, Doc III-25; MG Toney Stricklin, "Transforming the FA and the Force," Field Artillery, Mar-Apr 00, p. 1, Doc III-25A.

interim combat team brigades.[19]

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[19]Organizational and Operational Concept, The Brigade Combat Team, 6 Jan 00, pp. 23-24; Briefing, subj: Brigade Combat Team Fire Support, Jan 00, p. 17; Email msg, subj: IBCT, 6 Mar 00; Stricklin, "Transforming the FA and the Force," p. 1.

To enhance the operational and organizational effectiveness of the field artillery battalion, TRADOC made the fires and effects coordination cell, which was an emerging operational, organizational, and doctrinal concept in the Army and a beefed up fire support element according to the Commandant of the Field Artillery School, Major General Toney Stricklin, central to the direct support role and fashioned a significant break with the existing fire support organization. Historically, field artillerymen planned their fires based upon the availability of indirect fire support systems organic to or assigned to support the organization. As such, fire support planning focused more on positioning and allocating weapon systems, munitions, and servicing targets rather than achieving particular effects. The development of precision munitions, better non-lethal capabilities, increased ranges, and advances in communications led to orienting fire support on effects and not the systems that delivered the fires. At the brigade level the fires and effects coordination cell would perform the traditional functions of the fire support element, would obtain guidance from the commander about the desired effects, and then plan, prepare, and direct the execution of the desired effects utilizing organic and non-organic means. Unlike the existing fire support element, the fires and effects coordination cell would provide expanded access to joint assets, would furnish an ability to plan, coordinate, and employ lethal and non-lethal effects, and would perform a counterfire function.[20]

## Army Experimentation Campaign Plan

At a Pentagon presentation in mid-1998, the Commanding General of the U.S. Army Training and Doctrine Command (TRADOC), General William W. Hartzog, unveiled the blueprint of the future Army. Besides announcing the Army XXI heavy division structure upon which the 4th Infantry Division at Fort Hood, Texas, would be organized, equipped, and tested in a few years, General Hartzog said that the Army had developed a three-axis experimental plan to carry it beyond Army XXI to the Army After Next of 2025. The light axis would center on the development of new equipment and force structure for light contingency forces. The strike axis would concentrate on experimentation to develop a highly deployable brigade-size force to bridge the lethality and survivability gap between early entry and campaign forces, and finally the mechanized axis would focus on fielding the first digitized division in

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[20]Organizational and Operational Concept, the Brigade Combat Team, 6 Jan 00, pp. 43-45; Organizational and Operational Concept, the Brigade Combat Team, 3 Feb 00, pp. 42-44; Memorandum for Record, subj: Telephone Conversation with LTC Jim Lackey, TF2000, on 17 Mar 00, Doc III-26; Stricklin, "Transforming the FA and the Force," p. 1.

2000 and the first digitized corps in 2004.[21]

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[21] Dennis Steele, "The Army XXI Heavy Division: First Blueprint of the Future Army," Army, Jul 98, pp. 33-35, Doc III-68, 1998 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH); Briefing (Extract), subj: Army Experimentation Campaign Plan, 1998, Doc III-69, 1998 USAFACFS ACH; Annual Report (Extract), subj: Army After Next, 7 Dec 98, p. ii, III-70, 1998 USAFACFS ACH; Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99, Doc III-70A, 1998 USAFACFS ACH.

**Joint Contingency Force Advanced Warfighting Experiment.** Understanding that the Division Advanced Warfighting Experiment (DAWE) of 1997 concentrated on the heavy division, the Army knew that it had to modernize its light forces for contingency operations given the world situation. In view of this critical need, the Army decided in 1998 to look at its light units with the goal of digitizing them and to conduct a Joint Contingency Force Advanced Warfighting Experiment (JCF AWE) in September 2000 at the Joint Readiness Training Center (JRTC), Fort Polk, Louisiana, with the Air Force and the Marine Corps. The Joint Contingency AWE would examine ways to leverage information technologies, to improve the warfighting capabilities of the light contingency forces, to verify which systems would increase the lethality and survivability of joint contingency forces in an early-entry environment, and to keep the United States forces the dominant military land power. In mid-1998 the Army announced that the XVIII Airborne Corps would provide the experimental forces for this axis.[22]

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[22]Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99; Memorandum for Data Call Message Addresses, subj: Issue and Initiative Submission and Review Process, 12 Feb 99, Doc III-71, 1998 USAFACFS ACH; Msg, subj: Army Experimental Campaign Plan, 29 Sep 98, Doc III-72, 1998 USAFACFS ACH; Msg, Cdr, TRADOC, to HQ DA, subj: Request for Initiatives to Support Identified Issues in Support of JCF AWE, 0471850Z Feb 99, Doc III-73, 1998 USAFACFS ACH; Minutes, subj: Army Experimental Campaign Plan, 27-29 Jan 98, Doc III-74, 1998

USAFACFS ACH; Jason Sherman, "Lighten Up," Armed Forces Journal International, Oct 98, pp. 57-59, Doc III-75, 1998 USAFACFS ACH; Briefing (Extract), subj: Army Experimental Campaign Plan, 1998, Doc III-76, 1998 USAFACFS ACH; Briefing, subj: JCF AWE, Mar 99, Doc III-77, 1998 USAFACFS ACH; Steele, "The Army XXI Heavy Division: First Blueprint of the Future Army," p. 35; Fact Sheet, subj: JCF AWE, Apr 99, Doc III-27.

Although TRADOC anticipated that many technologies could transfer easily from the heavy division to the light, it knew that limitations existed. In Force XXI experiments in 1997, the Army equipped every platform from combat service support trucks to attack helicopters with computers that were linked to the tactical Internet, which was a system of computers, radios, and other communications equipment to simplify communications. With the light forces that digital link would be taken down to the individual soldier. During the Joint Contingency Force AWE, the Army and TRADOC planned to investigate technologies that would provide digital capabilities, enhance soldier protection, and furnish night vision, especially in urban terrain, for light force soldiers. At the same time the U.S. Army Field Artillery School intended to continue investigating the High Mobility Artillery Rocket System (HIMARS), the digitized Lightweight 155-mm. howitzer, digitized targeting systems, such as the Lightweight Laser Designator Rangefinder, precision munitions, and other fire support systems to determine their suitability and ability to furnish lethal fires for light forces. Ultimately, the Joint Contingency Force AWE would evaluate technologies, doctrine, and organizations to identify methods of enhancing lethality, survivability, and interoperability of joint contingency forces and to provide situational awareness to light forces that would be comparable to mechanized forces.[23]

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[23]Memorandum for Data Call Addresses, subj: Issue and Initiative Submission and Review Process, 12 Feb 99; "HIMARS for Deployable 'Heavyweight' Fires," Field Artillery, May-Jun 98, p. 33, Doc III-78, 1998 USAFACFS ACH; Sherman, "Lighten Up," pp. 57-58; Briefing (Extract), subj: Army Experimentation Campaign Plan, 1998; Briefing, subj: Army Experimentation Campaign Plan, Mar 99, Doc III-79, 1998 USAFACFS ACH. See Rupert Pengelly's "Battling with Tactical Internets," Jane's International Defense Review, Feb 00, pp. 44-50, Doc III-28, for a solid discussion of the tactical Internet.

In 1999 the Army further refined the purposes of the Joint Contingency Force AWE. Besides incorporating the rationale established in 1998, the Army decided to make the Joint Contingency Force AWE a culminating event for the AWE process. It would incorporate lessons learned from previous advanced warfighting experiments and exploit joint and light lessons learned. As the new purposes for the experiment suggested, the Army expanded the Joint Contingency Force AWE beyond its original intent. With the Chief of Staff's drive to find a more deployable force that began in mid-1999, the Army tied the Joint Contingency Force AWE to the initial brigade combat team effort. It hoped that lessons from the Joint Contingency Force AWE could be examined and perhaps used in the development of the initial brigade combat team that would be created at Fort Lewis, Washington.[24]

As a part of the Joint Contingency Forces AWE effort, the Field Artillery School proposed eight initiatives. The School wanted to test the Advanced Fire Support System, also known as rockets in box; a digitized M119 towed 105-mm. howitzer, a composite field artillery battalion composed of a lightweight 155-mm. towed howitzer, the High Mobility Artillery Rocket System (HIMARS), and Q-47 target acquisition radar; the Improved Positioning and Azimuth Determining System; the Profiler Meteorological System; the Situational Awareness Data Link that was an Air Force system designed to prevent fratricide; the Q-36 target acquisition radar to Close Air Support Quickfire Channel; and Naval Gunfire Interface. As the list suggested, the Field Artillery School as with the

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[24]Briefing, subj: JCF AWE, 25 Feb 00, Doc III-29; Email msg, subj: JCF-AWE, 24 Feb 00, Doc III-30.

Army made digitization a key issue in the Joint Contingency Force AWE to enhance lethality and survivability of a light contingency force.[25]

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[25]Briefing, subj: JCF AWE, 25 Feb 00; Information Paper, subj: JCF AWE, 2 Dec 99, Doc III-31; Interview, Dastrup with MAJ Michael J. Gould, Task Force 2000, USAFAS, 23 Feb 00, Doc III-32.

**Strike Force.** Concurrently, there would be strike force experimentation. Strike force development stemmed from the American experience during Operations Desert Shield/Storm of 1990-1991. Studying the deployment of units into Southwest Asia, the U.S. Army learned critical lessons about projecting military power from the United States. As the Chief of Staff of the Army, General Dennis J. Reimer, noted in 1998, Operations Desert Shield/Storm disclosed that the Army had to change. Deploying a heavy brigade to the Persian Gulf took eighteen days in 1990. In the future United States military forces would not have the luxury of taking so long to organize enough combat power in theater to prevent a major conflict. Potential enemies realized that giving the Americans time to build up their military forces and to set the terms of fighting could lead to disaster and defeat. Given this, potential enemies would most likely not permit the Americans to build up their military power at their leisure and then fight on their own terms. With this particular lesson of the Gulf War firmly fixed in the minds of the American military leadership, the U.S. Army, the Defense Science Board, the Army Science Board, and numerous studies conducted during the six years after the war concluded that the American military would have to force its way into the theater of operations against armed opposition in the future.[26]

In view of this scenario, the Army had to explore ways of making itself more deployable by cutting down the time required to move forces from the United States to overseas hot spots. From the perspective of 1998, future U.S. armed forces would have to possess the ability of applying decisive military power to deter or defeat acts of aggression, and this would require a rapidly deployable active and reserve component force with the capabilities of fighting across the full spectrum of conflict.[27]

As of 1998, TRADOC, which had the lead for force design options, noted that either light forces or mechanized forces were available to deter or defeat an aggressor and that each had strengths and weaknesses. Although Army XXI with its enhanced its firepower, command and control, and survivability would have outstanding early entry capabilities and would possess strategic mobility, a light force of the future would

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[26]Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99; Information Paper, subj: U.S. Army Strike Force, 4 Mar 99, Doc III-80; TRADOC News Service, "Army Eyes New Swift Deployment Headquarters," 4 Mar 99, Doc III-81.

[27]Briefing (Extract), subj: Army Experimentation Funding Campaign Plan, 1998; Msg, subj: Army Experimental Campaign Plan, 29 Sep 98.

still lack sufficient power to defeat a mechanized force. At the same time Army XXI would improve the mechanized force's command and control, strategic mobility, survivability, and lethality, but it still would require prepositioned equipment to enhance strategic mobility further. Thus, as action officers in Task Force 2000 noted, a gap existed between the light forces' and heavy forces' capabilities that influenced the ability to respond rapidly to deter or defeat aggression.[28]

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[28]Briefing (Extract), subj: Army Experimentation Funding Campaign Plan, 1998; Interview, Dastrup with LTC Charles Hernandez, TF 2000, 2 Mar 99, Doc III-82; MAJ C. Christopher Mack and MAJ William M. Raymond, Jr., "Strike Force: Fires for the Future," Field Artillery, Nov-Dec 98, pp. 16-17, Doc III-83.

Because of the deficiencies of either force and the requirement for a rapidly, deployable force, TRADOC at the direction of the Chief of Staff of the Army, General Dennis J. Reimer, began developing the Strike Force concept as early as 1996 and subsequently initiated Strike Force experimentation in 1998. Through Strike Force experimentation the Army planned to develop and field an adaptable, rapidly deployable force that would be decisive upon arrival and that could capitalize upon the best of light and mechanized forces. As envisioned early in 1998, the force would be a relatively small force with three thousand to five thousand soldiers and would be equipped and trained to deploy anywhere in the world in four to seven days by air or sea in response to a wide spectrum of threats and contingencies from early entry to peacekeeping operations. Equally important, the force would be able to deploy as rapidly as other early entry forces, would be more survivable, lethal, and maneuverable, and would present a smaller and more sustainable profile than current heavy force designs.[29]

In 1998 the Army examined four options to meet the requirement for a deployable, lethal force that combined the strengths of light and heavy forces in 1998. First, the Army could modernize the 2nd Armored Cavalry Regiment with near-term off-the-shelf technology. Second, the Army could develop a prototype Strike Force by anticipating capabilities and technologies that land forces would require twenty-five to thirty years in the future. Third, the Army could exploit leap-ahead technology to upgrade the 2nd Armored Cavalry Regiment dramatically. Fourth, the Army could design a force with force packaging and tactical tailoring to produce the capability of intervening rapidly and decisively. As TRADOC noted, options one through three spotlighted capabilities that

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[29]Mack and Raymond, "Strike Force: Fires for the Future," pp. 16-17; Information Paper, subj: U.S. Army Strike Force, 2 Mar 99; "Strike Force Army's 'Future' Test Bed," Fort Sill Cannoneer, 4 Mar 99, p. 2a, Doc III-84.

would form a standing organization core group and would have unit cohesion as a primary goal. In comparison, the fourth option centered on creating a highly deployable headquarters that could command and control a tailored force of Army of Excellence or Army XXI capabilities to meet the situation.[30] As the new Commanding General of TRADOC, General John N. Abrams, noted in October 1998, "We're probably going to have a blend of these ideas."[31]

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[30]Msg, subj: Army Experimental Campaign Plan, 29 Sep 98; Sherman, "Lighten Up," p. 60.

[31]Ibid.; Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99.

Although the final force structure design for the Strike Force did not exist at the end of 1998, Task Force 2000 and the U.S. Army Field Artillery School (USAFAS) were moving out to develop the Strike Force headquarters effects node that would be an integral part of the Strike Force headquarters combat information center. The node would assemble real time information, process that information, and direct the appropriate effects (lethal and non-lethal) to the required place in the battle space. As the Chief of Task Force 2000, Colonel Jerry C. Hill, explained, the headquarters effects coordination node would have three major areas -- the intelligence and targeting cell, the lethal effects cell, and the non-lethal effects cell. These cells would give the commander the desired effects, such as disrupting an enemy supply line or removing a communications center, without worrying about the source of the action. It could come from air strikes, field artillery, or any other source.[32]

Flexibility also influenced field artillery assets for the Strike Force. The Field Artillery School anticipated a composite field artillery battalion of High Mobility Artillery Rocket Systems (HIMARS), the Advanced Technology Light Artillery System (ATLAS), a platoon of AN/TPQ-47 radars, a terminal effects coordination platoon, and an electronic attack platoon. While HIMARS would provide long-range fires, ATLAS, renamed the Future Direct Support Weapon System in 1998, would furnish fires for close operations. Functioning as part of the command post, the effects coordination platoon

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[32]Ibid.; Msg with Atch, subj: Strike Force Effects Coordination Node, 25 Mar 99, Doc III-85; "Schoolhouse Developing 'Effects' Headquarters," Fort Sill Cannoneer, 4 Mar 99, p. 2a, Doc III-86; Fact Sheet, subj; Strike Force Headquarters Effects Coordination Node Development: A Depth and Simultaneous Attack Battle Lab and Task Force 2000 Initiative, 24 Mar 99, Doc III-87; Issue Submission Form, undated, Doc III-88.

would have state-of-the-art communications equipment and would plan, coordinate, and synchronize lethal and non-lethal effects from space, sea, air, or ground-based deliver systems throughout the battle space.[33]

[33]Mack and Raymond, "Strike Force: Fires for the Future," pp. 18-19.

Although the Field Artillery School was anticipating which fire support systems would be part of the Strike Force and although considerable thought was going into the composition of the Strike Force, the Army focused its attention on designing the headquarters. Late in 1998 and early 1999, the Army expected to form a Strike Force headquarters from existing resources using the 2nd Armored Cavalry Regiment to test the concept. Yet, the Strike Force effort made little progress. In 1999 the Chief of Staff of the Army, General Eric K. Shinseki, stopped work on the endeavor to spend time and attention on his goal of transforming the Army by creating the Initial Brigade Combat Team to develop a force that could be deployed in ninety-six hours.[34]

**Division Capstone Exercise.** Beyond Strike Force, the mechanized axis centered on the first digitized division and corps -- the 4th Infantry Division and III Corps. Upon the completion of the Division Advanced Warfighting Exercise of November 1997 that tested conceptual digitized enhancements to the heavy division, the Chief of Staff of the Army, Dennis J. Reimer, mandated a proof-of-concept demonstration to be conducted around 2001 to affirm the progress of key enhancements to the division. In response to the Chief of Staff's tasking, the U.S. Army Training and Doctrine Command (TRADOC) established the Division Capstone Exercise to serve as the capstone event for the 4th Infantry Division and not as a demonstration or test to be passed or failed.[35]

As decided by General Reimer in late 1998 and early 1999, the Army with TRADOC taking the lead would conduct a live fight at the National Training Center, Fort Irwin, California, in March 2001 (phase one) and a constructive fight (phase two) in September-October 2001 at Fort Hood, Texas. In these exercises the digitized 4th Infantry Division would demonstrate its warfighting capability under a realistic and demanding scenario, would assess the progress of meeting Force XXI doctrine, training, leadership, organization, materiel, and soldiers requirements (DTLOMS), would conduct the Force XXI Battle Command Brigade and Below (FBCB2) limited users test, and would integrate command, control, communications,

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[34]Msg with Atch, subj: Strike Force Effects Coordination Node, 25 Mar 99; TRADOC News Service, "Army Eyes New Swift Deployment Headquarters," 4 Mar 99; Interview, Dastrup with COL Jerry Hill, DAC Futures Director, 22 Feb 00, Doc III-33.

[35]Fact Sheet, subj: Division Capstone Exercise, Apr 99, Doc III-33A; Study Plan for the Division Capstone Exercise (Extract), Jan 00, pp. 1-2, Doc III-33B.

computers, and intelligence (C4I) at all command levels.[36]

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[36] Ibid., p. 1; Memorandum for Record, subj: 1st Quarter Significant Activities for MAJ Raymond, 12 Jan 99, Doc III-33C; Memorandum for Record, subj: 1st Quarter FY99 Significant Activities, 19 Jan 99, Doc III-33D; Memorandum for Record, subj: 2nd Quarter FY99 Significant Activities,

31 Mar 99, Doc III-33E; Memorandum for Assistant Commandant, subj: Third Quarter FY99 Significant Activities, 1 Jul 99, Doc III-33F; Interview, Dastrup with LTC Jeff Ewing, TF 2000, 27 Mar 00, Doc III-33G; Memorandum for LTC Charles Hernandez, TF2000, subj: SME Review of AECP for 1998 Annual Command History, 31 Mar 99; Msg, subj: Army Experimental Campaign Plan, 29 Sep 98; Briefing (Extract), subj: Army Experimental Funding Campaign Plan, 1998; Briefing, subj: Division Capstone Exercise, 16 Feb 99, Doc III-89, 1998 USAFACFS ACH; Briefing, subj: Army Experimental Campaign Plan Video Teleconference, 20 Feb 98, Doc III-90, 1998 USAFACFS ACH; Steele, "The Army XXI Heavy Division: First Blueprint of the Future Army," p. 34; Study Plan for the Division Capstone Exercise (Extract), Jan 00, p. 2.

The division capstone exercises would also furnish an opportunity to accomplish various objectives. While the 4th Infantry Division and III Corps would use the exercises to accomplish training objectives, the Army's test and evaluation community planned to test the FCB2. At the same time the division capstone exercise team would assess the progress in meeting Force XXI DTLOMS requirements since the Division Advanced Warfighting Exercise of 1997.[37]

**Effects Coordination Cell/Fires Effects Coordination Cell**

[37] Study Plan for the Division Capstone Exercise (Extract), Jan 00, p. 5.

Looking into the future, the U.S. Army Field Artillery School (USAFAS) saw a battlefield that would be characterized by distributed operations with non-linear, non-contiguous, and well-dispersed forces. To win on that battlefield the joint force or combined arms commander would require effective fires but should not have to worry about their origins. The commander should only have to be concerned about the effects of the fires. For the Field Artillery, this meant providing robust fires platforms with the ability to conduct technical fire direction, revolutionizing the methods of distributing fires, tailoring the force to meet the threat, and designing a radically different team approach for streamlining fire support organizations and battle staff processes. Essentially, the Field Artillery had to adjust its existing fire support operations and organizations that had their roots in the first part of the twentieth century for a new paradigm of effects based fires.[38] As one Field Artillery officer pointed out, "Current digital operations are just the old way of executing fire support operations, but now we sometimes plan and execute with computers. . . . We have refined and digitized this process [fire support]; but, at its base, it has changed little since the early 20th century."[39]

Transforming fire support involved integrating and synchronizing fires from one organization. The Field Artillery had to go beyond the sensor-to-shooter links being developed late in the 1990s. Twenty-first century fires would require sensor linkages to a much broader range of on-demand effects through a centralized Effects Coordination Cell (ECC) that would be linked to a multitude of sensors and effects providers, such as field artillery, naval gun fire, close air support, precision munitions, unmanned aerial vehicles, and even satellites; and would demand consolidating existing fire support elements at the various command echelons because they could not adequately leverage all effects deliverers and sensors. As envisioned at the end of 1998, the ECC would be capable of establishing, altering, and terminating direct

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[38]BG Toney Stricklin, "Fires: The Cutting Edge for the 21st Century," Field Artillery, May-Jun 98, pp. 22-23, Doc III-91, 1998 U.S. Army Field Artillery Center and Fort Sill (USAFACFS)Annual Command History (ACH); Interview, Dastrup with MAJ Gregory A. Palka, TF 2000, 30 Mar 99, Doc III-91A, 1998 USAFACFS ACH; Briefing, subj: The Effects Coordination Cell, 24 Mar 99, Doc III-92, 1998 USAFACFS ACH; Fact Sheet, subj: Futures Fires Command and Control Concept Experimentation Program, 24 Mar 99, Doc III-93, 1998 USAFACFS ACH.

[39]Msg with Atch, subj: ECC Info Requested, 23 Mar 99, Doc III-94, 1998 USAFACFS ACH.

sensor-to-effects links within seconds without lengthy coordination to meet rapidly changing battlefield requirements, would provide a full spectrum of effects management in decisive, shaping, and sustainment missions, and could be tailored optimally to accomplish the mission. Although the Field Artillery School's vision of the ECC's organization was still in the developmental phase at the close of 1998, it, nevertheless, concluded that the cell would most likely be at the brigade, division, and corps levels and would functionally integrate effects delivery systems and organizations, initiated action in 1998 to develop a prototype ECC by 1999 for the corps, and probably would gain many lessons learned from the effects node being developed for the Strike Force headquarters as part of the Army Experimental Campaign Plan to modernize army organizations.[40]

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[40]Stricklin, "Fires: The Cutting Edge for the 21st Century," pp. 22-24; Briefing, subj: The Effects Coordination Cell, 24 Mar 99; Briefing, subj: Future Fires Command and Control Concept Experimentation Program, 9 Dec 98, Doc III-95, 1998 USAFACFS ACH; Memorandum for MAJ Gregory A. Palka, subj: SME Review of ECC for 1998 Annual Command History, 31 Mar 99, Doc III-95A, 1998 USAFACFS ACH;

Fact Sheet, subj: Future Fires Command and Control Concept Experimentation Program, 24 Mar 99; Msg with Atch, subj: ECC Info Requested, 23 Mar 99; Interview, Dastrup with LTC Peter R. Baker, TF 2000, 23 Mar 00, Doc III-34.

In 1999 the new Commandant of the Field Artillery School, Major General Toney Stricklin, generated significant changes with the ECC endeavor. Arriving in August 1999, General Stricklin outlined a vision of focusing on near-term improvements to fire support as well as long-term improvements whereas his predecessor concentrated on long-term enhancements to fire support. Along this line General Stricklin believed that ECC had to have applicability for today's Army to gain acceptance, that the Field Artillery School was overselling what the ECC could do, and that the ECC lacked critical tools to permit it to function as envisioned. To implement the full vision of the ECC required communications systems with a greater band width and more robustness, firing platforms with the ability to do more technical work than existing systems, and a better understanding of digitization. In view of this, General Stricklin advocated scaling back the ECC's functions and renamed it the Fire Effects Coordination Cell to signify an evolution from the fire support element and to gain wider acceptance in the Army. Yet, the General never abdicated the full vision of the ECC, directed his officers to work towards the vision as initially outlined, but told them to implement the Fires Effects Coordination Cell as a near-term solution.[41]

Just as General Stricklin was outlining his vision of the Fire Effects Coordination Cell, General Shinseki announced his Initial Brigade Combat Team concept in October 1999 to make the Army more strategically deployable and lethal. Basically, the Initial Brigade Combat Team endeavor involved fielding a more deployable yet lethal brigade between 2000 and 2003 and provided an excellent opportunity to introduce the Fire Effects Coordination Cell.[42]

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[41]Ibid.; "Medium-weight Units to Take Advantage of Effects-Based Operations," Inside the Army, 10 Apr 00, pp. 6-8, Doc III-33H.

[42]Interview, Dastrup with Baker, 23 Mar 00.

As it existed in 1999, the Fire Effects Coordination Cell represented a significant evolution of the fire support element. Besides providing the same functions as the fire support element, the Fire Effects Coordination Cell introduced new functions. It could conduct information operations, furnish deep operations that were formerly done by the Deep Operations Coordination Cell at the corps and close support, and coordinate nonlethal effects using electronic warfare and nonlethal munitions. Each of these functions were formerly beyond the purview of the fire support element at brigade.[43]

## Assessing the Future

Prompted by the Commanding General of the U.S. Army Training and Doctrine Command, General John N. Abrams, in a letter of August 1999 and by his own vision, Major General Toney Stricklin, critiqued the state of the Field Artillery upon becoming the Commanding General of the U.S. Army Field Artillery Center and Fort Sill (USAFACFS) in August 1999. General Stricklin believed that USAFACFS had to assess its current state, had to develop a vision of the future and strategic goals, had to review tactics, techniques, procedures, and doctrine to make certain that the Field Artillery was pointed in the right direction, and had to shake up the status quo if necessary. Above all, USAFACFS had to analyze recent trends at the combat training centers to glean the lessons learned and had to improve fire support to the maneuver arms, which was his biggest concern. To accomplish

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[43]Ibid.

this list of objectives, General Stricklin assembled his senior colonels and lieutenant colonels in an executive working group in September 1999.[44]

[44]Interview, Dastrup with MAJ Murray Duff, Director, CG's Planning Group, 5 Jan 00, Doc III-34A; Memorandum, subj: None, 30 Aug 99, Doc III-35; Briefing (Extract), subj: Executive Working Group, 10 Sep 99, Doc III-36; Memorandum, subj: Commander's Intent, 10 Aug 99, Doc III-37; Email msg, subj: Assess the Future, 10 Feb 00, Doc III-38.

The executive working group examined four major subject areas: mission/vision, doctrine/fire support integration, school/unit training, and installation vision. After the working group pointed many strengths and weaknesses, General Stricklin evaluated them and integrated them as a part of his overall assessment of the Field Artillery. Based upon this, General Stricklin committed himself to implementing rapidly the changes that he thought were appropriate and executable. To refine the changes further and to address directly the perception that Fort Sill and the Field Artillery School had turned inward by focusing on weapon systems and away from the close fight, the General hosted a tactical/operational fire support conference in January 2000.[45]

**Tactical/Operational Fire Support Conference**

Dedicated to improving fire support for the maneuver commanders and their emerging concerns about the Field Artillery School's commitment to combined arms operations, the Commanding General of the U.S. Army Field Artillery Center and Fort Sill (USAFACFS), Major General Toney Stricklin, sought input from the field during the latter months of 1999 and reached an interesting conclusion. Maneuver commanders perceived that the Field Artillery School had turned inward and focused on field artillery branch issues at the exclusion of supporting the maneuver commander in combined arms operations. To find ways to eliminate the perception, even though it might only be perceived and not real, General Stricklin hosted a Tactical/Operational Fire Support Conference for maneuver commanders, their fire support coordinators, command sergeant majors, and the Field Artillery School in January 2000. In the conference participants freely discussed a variety of issues, ranging from the close fight to

[45]Email msg, subj: Assessing the Future, 10 Feb 00.

digital fire planning versus voice execution, to name just a few, and made recommendations to resolve deficiencies and perceptions about fire support.[46]

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[46]MG Toney Stricklin, "Field Artillery: Relevant, Trained, and Ready," Field Artillery, Sep-Oct 99, pp. 1-2, Doc III-39; Interview, Dastrup with MAJ Troy A. Daugherty, Basic Fire Support Branch, Fire Support and Combined Arms Department (FSCAOD), 2 Feb 00, Doc III-40; Tactical/Operational Fire Support Conference, 18-20 Jan 00, Issue Papers, Doc III-41; Email msg, subj: Jan 2000 Fire Support Conference, 1 Feb 00, Doc III-42; "CG Calls for Action; Leads Fire Support Conference," Fort Sill Cannoneer, 3 Feb 00, pp. 1a, 2a, Doc III-43; MG Toney Stricklin,"Transforming the FA and the Force," Field Artillery, Mar-Apr 00, pp. 1-2, Doc III-43A.

With a commitment to making immediate fixes and ensuring effective fire support for the maneuver arms, General Stricklin focused upon two of the nineteen issues that were discussed during the conference -- target location systems for fire supporters and placing most experienced and best qualified people in company, battalion, and brigade fire support positions -- with the idea that they could be fixed quickly. Conference participants agreed that accurate target location was the first element of accurate predicted fire, that it was also the single largest reason cited by observers/controllers at the combat training centers for poor fires effects in the close fight, that little had been done to improve the ability to determine accurate target location, and that the ability to locate targets accurately had not kept pace with the requirements for accurate predicted fire. From the perspective of the conference participants, the ground/vehicular laser locator designator (G/VLLD) in use was inadequate because it was too heavy for a soldier to pack around when it was detached from a vehicle and because the power supply system (batteries) lost power too fast when it operated away from the vehicle. In view of these deficiencies, conference participants suggested that adopting a lightweight, laser-rangefinder with a global positioning system to locate targets accurately should be the number one priority and even questioned the viability of a laser designator because smart munitions that did not require a forward observer to designate were being developed. Although they favored the lightweight laser designator rangefinder (LLDR) under development with one prototype already produced, conference participants wanted something sooner. Mass production of the LLDR would begin in 2002 with fielding in 2004. As result, some units would have to depend upon the antiquated G/VLLD for at least four years, while others would wait for ten years before receiving the LLDR because of the time required to field the system.[47]

As to be expected, conference participants provided two major recommendations for better accurate target location. First, the Field Artillery School could determine how production and fielding of the LLDR could be moved up so that units would receive them well before 2014. Second, the Army

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[47]Interview, Dastrup with Daugherty, 2 Feb 00; Tactical/Operational Fire Support Conference, 18-20 Jan 00, Group Out Briefs, pp. 11-12, Doc III-44; Tactical/Operational Fire Support Conference, 18-20 Jan 00, Issue Papers, Target Location for Fire Supporters; Email msg, subj: Tactical/Operational Fire Support Conference of Jan 00, 7 Feb 00, Doc III-45; Memorandum for Command Historian, subj: 1999 USAFACFS Annual Command History, 23 Mar 00, Doc III-45A.

could procure off-the-shelf devices that could furnish accurate target location in the near future. At the present the Mark 7 produced by Litton Industries or the Viper 4 produced by Leica could provide a solid interim solution until the LLDR could be fielded.[48]

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[48]Interview, Dastrup with Daugherty, 2 Feb 00; Tactical/Operational Fire Support Conference, 18-20 Jan 00, Group Out Briefs, pp. 10-11; Tactical/Operational Fire Support Conference, 18-20 Jan 00, Issue Papers, Target Location for Fire Supporters; Email msg, subj: Tactical/Operational Fire Support Conference of Jan 00, 7 Feb 00.

General Stricklin also focused his attention on the quality level of fire support officers. As the conference participants pointed out, fire support officers played a critical role. However, inexperienced officers served in fire support positions in maneuver units. For example, the existing career progression path moved lieutenants from company fire support officer to fire direction officer to platoon leader and advanced captains from the Captain Career Course to fire support officer or various staff assignments then to battery command. Similarly, majors served as a battalion S-3 (operations) officer, executive officer, brigade/division S-3 or assistant S-3, or staff officer. This meant that most company, battalion, or brigade fire support officers were staffed by inexperienced junior officers through no fault of their own because the system dictated using them in such positions. Such a situation often led to incomplete fire support plans that failed to support the maneuver commander's plan.[49]

To eliminate this problem conference participants provided insightful recommendations. They urged rewriting Department of the Army Pamphlet 600-3 so that critical fire support positions were identified, so that the most experienced officers served in fire support positions, and so that junior officers received fire support experience prior to becoming a fire support officer. Basically, the recommendations involved reversing career progression patterns. Following the Captain Career Course, captains should move from battery command to fire support. After completing the Command and General Staff College, majors should advance from S-3 or executive officer to brigade fire

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[49]Tactical/Operational Fire Support Conference, 18-20 Jan 00, Group Out Briefs, pp. 6-7, 9-10, 10-12; Tactical/Operational Fire Support Conference, 18-20 Jan 00, Issue Papers, Fire Support Officer; Memorandum for Command Historian, subj: 1999 USAFACFS Annual Command History, 23 Mar 00.

support officer. At the same time lieutenants should be a fire direction officer and a platoon leader before becoming a company fire support officer.[50]

[50]Tactical/Operational Fire Support Conference, 18-20 Jan 00, Group Out Briefs, pp. 7, 9, 10; Interview, Dastrup with Daugherty, 2 Feb 00.

Assessing the input from the conference, General Stricklin said that it reinforced his interest in continuing the dialog between maneuver commanders and fire support officers and that it called for action. In view of this, he took the recommendations on accurate target location, the qualifications and experience of fire support officers, and other issues and pledged to work on them. Some of the issues could be solved quickly, while others would take time.[51]

**Field Artillery and Effective Close Support**

Towards the end of 1999 and the first of 2000, a vigorous debate erupted over the Field Artillery's ability to furnish effective close support. Although many Field Artillery officers recognized the requirement for effective close support for the maneuver forces and discussed it, the Commandant of the Infantry School at Fort Benning, Georgia, Major General Carl F. Ernst, criticized the Field Artillery and fire support in "Is the FA Walking Away from the Close Fight?" published in the Field Artillery in the September-October 1999 issue. "Without question, our current and projected Field Artillery (FA) systems provide an unparalleled degree of range, accuracy and lethality," General Ernst wrote.[52] He then pointed out, "However, the capabilities of these systems will never eliminate the close fight. Whenever there is a requirement to seize and hold a piece of terrain, there will be a requirement for infantry boots in the sand, dust or mud, accompanied by tanks and Bradleys and the close supporting fire of the King of Battle."[53] Although General Ernst did not furnish a precise definition of close fight for fire support, he indicated that it had to be sufficiently

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[51]Ibid.; "CG Calls for Action; Leads Fire Support Conference," pp. 1a, 2a; Stricklin,"Transforming the FA and the Force," p. 2.

[52]MG Carl F. Ernst, "Is the FA Walking Away from the Close Fight?" Field Artillery, Sep-Oct 99, p. 8, Doc III-46.

[53]Ibid.

close to kill the enemy or close enough to force the enemy to keep its head down to permit friendly infantry to advance without fear of hostile small arms or field artillery fire.[54]

After discussing the increased centralization of forward observer assets under the fire support team concept since the 1980s, General Ernst added this piece of advice. He explained:

[54]Ibid.

> We must not lose sight of the close fight. We may weaken the enemy from a distance, but history has sown us time and again that to win the battle, we must close with and destroy the enemy in close, personal and brutal combat. To close that final distance under enemy fire without the suppressive and destructive effects of indirect fires is worse than folly – its suicide."[55]

This basically outlined the General's argument. The Field Artillery had to provide effective close support for friendly infantry and armor to close with the enemy with a minimal amount of casualties from enemy fire.[56]

General Ernst found backing from Lieutenant General Kevin P. Byrnes, the former commander of the 1st Cavalry Division at Fort Hood, Texas. In an article in Field Artillery in the January-February 2000 issue, General Byrnes wrote, "Yes, in many respects, the FA has walked away from the close fight."[57] From General Byrnes, a former field artillery battalion commander, the problem stemmed from inadequate radios without the power and range required to call for fires, from inadequate power sources for night sights, from overworked fire direction centers, from the nature of training, and from priorities. He explained that the Field Artillery sometimes paid too much attention to the delivery of fires at the expense of the role of fire support.[58]

To provide better close support the Field Artillery had to deliver responsive fires when and where the maneuver commander wanted them. This meant hitting targets of opportunity, shifting fires rapidly and effectively around the

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[55] Ibid., p. 11.

[56] Ibid.

[57] Interview, Patrecia Slaydon Hollis, with Byrnes, in Field Artillery, Jan-Feb 00, p. 6, Doc III-47.

[58] Ibid.

battlefield, updating doctrine because part of it was obsolete, and examining the requirement to consolidate the fire support teams at the company level or a higher echelon of command. From General Byrnes's perspective, providing more responsive fires meant centralizing fire support even more to give the commander more flexibility to see the fight and to link the combat observation lasing teams or fire support teams to the shooters.[59]

[59] Ibid., p. 8

As might be expected, criticism of fire support generated a vigorous rebuttal. The Director of the Gunnery Department in the Field Artillery School, Colonel Thomas G. Waller, Jr., wrote, "First, we should ask the question more broadly — is the Army, our country walking away from the close fight?"[60] Answering his own question, he said, "'Yes', and we should thank God we live in a country that does not squander the lives of our sons and daughters. . . . Our national conscience was seared by the close fights and high casualties of the Civil War and World War I. As casualties mounted in World War II, we began to search for technological alternatives to the brutalities of the close fight."[61] Colonel Waller then added, "The lessons of Korea, Vietnam, and the Iran fiasco finally produced an Army and a strategy that were in synch with Washington policy — all levels clicked together in Operation Desert Shield/Desert Storm. The close fights were brief, one-sided affairs with few allied casualties."[62]

Although the Colonel Waller applauded the steps taken to avoid casualties, he also conceded that the Field Artillery could be better prepared for the close fight. With the replacement of cannon by rockets and missiles for general support units, the preponderance of improved conventional munitions in the basic loads, and the trend toward precision munitions and munitions centrality, the Field Artillery lost some of its capability to furnish close support. Yet, with the arrival of a new Chief of Field Artillery, Major General Toney Stricklin, in August 1999, Colonel Waller pointed out, the Field Artillery started reexamining the attention given to the close fight and took steps to improve such support.[63]

Others reacted to the criticism about the Field Artillery lack of attention to the close fight, but the Commandant of the Field Artillery School and the Chief of Field Artillery, Major General Toney Stricklin, captured the essence of the argument. Writing in the Fort Sill Cannoneer in February 2000, he observed that there was a perception that the Field Artillery had walked away from the close fight and had focused on field artillery issues. As long as the perception existed, he continued, it was a problem. The Field Artillery had to demonstrate its commitment to the close fight.[64]

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[60]COL Thomas G. Waller, Jr., "We Have Work to Do," Field Artillery, Jan-Feb 00, p. 2, Doc III-48.

[61]Ibid.

[62]Ibid.

[63]Ibid., p. 3.

[64]K. Douglas Cook, "Always Remember: We're the King of Battle," Field Artillery, Jan-Feb 00, pp. 3-4, Doc III-49;

LTC (R) Robert P. Kingsbury, "'Close' Means 50 Meters," Field Artillery, Jan-Feb 00, p. 4, Doc III-50; "CG Calls for Action; Leads Fire Support Conference," Fort Sill Cannoneer, 3 Feb 00, pp. 1a, 2a, Doc III-51.

**Combat Training Centers and Trends Reversal**

On 15 January 1999 the Deputy Commanding General for Combined Arms at the U.S. Army Training and Doctrine Command (TRADOC), Lieutenant General William M. Steele, held a conference with the combat training centers (CTC) at Fort Leavenworth, Kansas, to discuss trends or problems across the battlefield operating systems. To his dismay General Steele learned that existing trends or problems across the battlefield operating systems, which consistently challenged unit operations and warfighting capabilities, were the same ones that had been identified when he was at the National Training Center, Fort Irwin, California, some ten years earlier, and had not been eliminated. He then asked the commander of the National Training Center about the lack of progress, and he responded that TRADOC's service schools were not on board and helping to eliminate the problems. Prompted by this, General Steele tasked the Center for Army Lessons Learned (CALL) at Fort Leavenworth in February 1999 to identify the trends or problems that required reversing, directed TRADOC service schools to cooperate by furnishing solutions, and established the CTC conference of 28 April 1999 as the suspense date for briefing solutions. Meeting the suspense meant reinvigorating the TRADOC Remedial Action Program (TRAP) that identified problems, established solutions, and called for updates by the proponents to ensure that corrective actions were being taken.[65]

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[65]Interview, Dastrup with MAJ Daryl Andrews, Fire Support Division, Fire Support and Combined Arms Department, 6 Jan 00, Doc III-52; Memorandum for See Distribution, subj: CTC Trends Reversal Program, 22 Feb 98, Doc III-53; Email msg, subj: Trends, 5 Mar 99, Doc III-54.

Shortly after General's Steele's tasking, CALL pointed out the number one emerging negative trend in fire support. Based upon its analysis, CALL wrote in February 1999, "Indirect fires do not support the close fight."[66] At the Joint Readiness Training Center (JRTC) where contact was made very quickly with the opposition force using guerrilla warfare tactics in low-intensity scenarios, infantry platoon leaders and forward observers reluctantly employed indirect fires during small unit contacts. They feared fratricide because the enemy was often only two hundred to three hundred meters away and because many fire support teams were not adequately drilled to provide fire at such close ranges or to adjust fires rapidly in such situations.[67]

At the same time CALL addressed fire support for the heavy forces. At the National Training Center (NTC) where contact was made over a vast, expansive, desert landscape with an armored enemy during high-intensity conflict scenarios, brigades had difficulties shifting from deep operations to close support. Task force observers were routinely out of position to observe enemy formations. Targets were not planned along enemy avenues of approach, and task force observers were not in communication with the appropriate fire support agencies to attack targets of opportunity as they appeared on the battlefield.[68]

Assuming proponency for the trend reversal issue, "Integration of Fires with Maneuver," to improve fire support for the close fight, the U.S. Army Field Artillery School outlined solutions. The school assigned its Fire Support and Combined Arms Department (FSCAOD) the lead. To make the trend reversal issue more manageable, the school divided it into five areas of focus: maneuver commander's intent and focus of fires, transition from the brigade deep battle to the task force close fight, setting the conditions for suppression, obscuration, secure, and reduce (SOSR) to achieve a breach in an obstacle, training and utilization of the combat observation lasing teams (COLTS) in the maneuver brigade, and the integration of aviation into the close fight. Specifically, the school sought input from the Armor School at Fort Knox, Kentucky, the Infantry School at Fort Benning, Georgia, and the fire support trainers at the combat training centers and planned to address each issue based upon doctrine, training, leadership, organization, material, and soldiers (DTLOMS), fix responsibilities, update field manuals and to observe a focused combat training center rotation at the

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[66] Ibid.

[67] Ibid.

[68] Ibid.

National Training Center in August 2000 for a heavy force and the Joint Readiness Training Center in April 2001 for a light force. The focused rotations at the combat training centers would permit observing the solutions to determine their success and to outline further remedial actions if necessary.[69]

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[69]Memorandum for LTC William M. Steele, subj: Combat Training Center (CTC) Trends Reversal Program, 18 Mar 99, Doc III-55; Briefing, subj: USAFAS Fire Support Trends Reversal, 14 Aug 99, Doc III-56; Email msg, subj: none, 6 Jan 00, Doc III-57; Memorandum for Record, subj: Quarterly Update from AC's Office, undated, Doc III-58; Memorandum for See Distribution, subj: Trends Reversal Conference Minuted, 28 Apr 99, 14 May 99, Doc III-59; Email msg with atch, subj: CTC Trends Lines Reversal, 31 Jan 00, Doc III-60; Memorandum for Command Historian, subj: 1999 USAFACFS Annual Command History, 23 Mar 00, Doc III-45A.

As General Steele pointed out, the Project Warrior Program initially began in 1989 with a memorandum of understanding among the Combined Arms Training Activity (CATA), the U.S. Army Total Army Personnel Command (PERSCOM), and the U.S. Army Training and Doctrine Command would be a key to the success of the trends reversal program. The memorandum of understanding intended to spread the expertise of the observers/controllers at the combat training centers to the rest of the force by assigning them to TRADOC service schools as instructors or doctrine writers where they could directly influence the writing of doctrine and/or teaching soldiers. Although the second memorandum of agreement of 1993 among CATA, PERSCOM, and TRADOC was unsigned, the Field Artillery assigned officers with combined training center experience and certification in 1999 to the Field Artillery School as instructors or doctrine writers in keeping with the spirit and intend of the Project Warrior Program and with understanding that they were vital to the success of the trends reversal program and that they provided the Army with subject matter experts to train soldiers at the schools and instructors and to write doctrine.[70]

In August 1999 the Field Artillery School's action plan underwent a significant reorientation. Under Major General Leo J. Baxter, who was the Commandant of the School from June 1997 to mid-August 1999, school focused on long-term solutions. When Major General Toney Stricklin arrived in August 1999, the focus shifted to the near-term with trends that could be fixed in the next one to two years. He wanted the school to fix doctrine, and tactics, techniques, and procedures, to look at current and future equipment issues, and to help units with home station training in effort to improve fire support in the close fight.[71]

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[70]Point Paper, subj: To Explain the Status of Project Warrior, 3 May 99, Doc III-61; Email msg, subj: CTC Conference, 26 Apr Minutes; Next CTC Conference, 23-25 Aug, 18 Jan 00, Doc III-62; Interview, Dastrup with Andrews, 6 Jan 00.

[71]Ibid.; Email msg with Atch, subj: CTC Trend Lines

**The Defense Advisory Committee on Women in the Services: Proposals for the Multiple-Launch Rocket System Career Field to be Open to the Assignment of Women**

Beginning in October 1996 and continuing into 1998, the Defense Advisory Committee on Women in the Services (DACOWITS) fought to open Multiple-Launch Rocket System (MLRS) units to women because the system would be employed at great distances from the front and would be out of range of direct combat action and repeatedly demanded the Army for justification on the policy of closing MLRS to women. By taking this position on women, the committee fundamentally disagreed with the Department of Defense Direct Ground Combat Definition and Assignment Rule's collocation exception policy of 1994 that closed MLRS units to women soldiers. Essentially, the policy defined direct ground combat as engaging an enemy on the ground with individual or crew-served weapons, while being exposed to hostile fire and to a high probability of direct physical contact with hostile force's personnel. Direct combat took place well forward on the battlefield while locating and closing with the enemy to defeat it by fire, maneuver, or shock effect. Army implementation instructions outlined that infantry, armor, and field artillery battalions met the direct combat definition or one of its exclusion provisions, such as collocation. By collocation the Army meant being placed side by side on the battlefield as a member of a combined arms team, and field artillery cannon and MLRS units could be collocated with the other combat arms on the battlefield in combined arms operations. For the DACOWITS collocation was just another weak rationale for excluding women from MLRS units and pressed to have women admitted to

MLRS units.[72]

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[72]Memorandum for Cdr, U.S. Army Field Artillery Center and Fort Sill (USAFACFS), subj: Proposal for MLRS Career Field to be Open to the Assignment of Women, 5 Nov 98, Doc III-55, 1998 USAFACFS ACH; Briefing, subj: Initial CG Brief, 23 Nov 98, Doc III-56, 1998 USAFACFS ACH; Briefing, subj: CG Update, 7 Dec 98, Doc III-57, 1998 USAFACFS ACH; Interview, Dastrup with LTC William A. Rigby, Chief, Field Artillery Proponency Office (FAPO), 3 Mar 00, Doc III-64. Note: According to Dr. Cori Dauber and Judge Paul DeMuniz, who are members of DACOWITS, DACOWITS has been trying since 1988 to open MLRS to women. The most recent attempts came

in 1996 and 1998. See Memorandum for LTC William Rigby, FAPO, USAFAS, subj: SME Review of DACOWITS Portion of 1998 Annual Command History, 18 Feb 99, Doc III-58, 1998 USAFACFS ACH; Memorandum with atch for MG Leo Baxter, subj: DACOWITS Visit to Fort Sill, 11 Oct 99, Doc III-.

On 10 January 1997 the Field Artillery School provided a response to the October 1996 DACOWITS's recommendation and sent it through command channels to the Department of the Army. For unknown reasons the memorandum never reached DACOWITS and sat in the office of the Assistant Secretary of the Army for Manpower and Reserve Affairs for over a year. The failure to receive any response from the Army then caused DACOWITS to react strongly with disappointment at its fall 1998 conference and to approach the Army once again with the recommendation to integrate women into MLRS units.[73]

[73]Msg, subj: DACOWITS, 5 Feb 99, Doc III-59, 1998 USAFACFS ACH; Briefing, subj: Initial CG Brief, 23 Nov 98; Briefing, subj: CG Update, 7 Dec 98.

Directed by the Deputy Chief of Staff for Personnel at Department of the Army, Lieutenant General David H. Ohle, the U.S. Army Field Artillery School (USAFAS) prepared the Army's response to the DACOWITS recommendation of the fall of 1998. Basically, the General wanted the Field Artillery School to provide a cogent explanation for excluding women from serving in MLRS units in the future. Using the direction furnished by the Commanding General of the U.S. Army Field Artillery Center and Fort Sill and Commandant of the Field Artillery School, Major General Leo J. Baxter, the Field Artillery School prepared a response in December 1998 employing doctrine as a rationale and therefore avoided the equality issue that focused upon a woman's ability to serve in a MLRS unit.[74] In a lengthy memorandum of 10 December 1998 written by the Field Artillery Proponency Office in the School, General Baxter explained, "MLRS doctrine has always been to fight forward and place launchers as close to the FLOT [forward line of troops] as possible."[75] Doctrine taught that MLRS units fought at close ranges to support the maneuver forces and to engage the enemy at the maximum ranges possible. In Operation Desert Storm of 1991, for example, MLRS units conducted artillery raids across the FLOT before maneuver units advanced and repeatedly intermixed with maneuver units in large ground formations that invited close, direct fire by the enemy. After addressing MLRS and cannon doctrine and other related issues in detail, General Baxter concluded, "MLRS meets the criteria as stated in the Secretary of Defense 1994 Memorandum and the Department of Army implementation instructions. . . ."[76] As a crew-served weapon, MLRS would be exposed to direct hostile fire, would have a high probability of direct ground attack, and would be deployed well forward. In view of current doctrine and after careful consideration, the Department of Army implementation message for the direct ground combat policy that directed that Field Artillery battalions should remain closed to women was appropriate and should not change, according to General Baxter.[77]

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[74]Memorandum for Cdr, USAFACFS, subj: Proposal for MLRS Career Field to be Open to the Assignment of Women, 5 Nov 98; Msg, subj: DACOWITS, 5 Feb 99; Briefing, subj: Initial CG Brief, 23 Nov 98; Briefing, subj: CG Update, 7 Dec 98; Memorandum for Deputy Chief of Staff for Personnel, subj: DACOWITS Proposal for MLRS Career Field to be Open to the Assignment of Women, 10 Dec 98, Doc III-60, 1998 USAFACFS ACH.

[75]Ibid.

[76]Ibid.

[77]Ibid.

Notwithstanding the Field Artillery School's and Army's position, DACOWITS continued the fight to open MLRS units to women into 1999. At the DACOWITS spring conference of 1999, General Baxter briefed attendees about the tactics, doctrine, and mission of MLRS, basically repeating what he had said in December 1998. Throughout his briefing he explained that MLRS was a crew-served, surface-to-surface weapon system, that it would be exposed to hostile fire through direct ground attack, that it would be deployed well forward, and that it was part of the combined arms team.[78] Continuing, General Baxter said, "We believe field artillery exists solely to fight as part of the combined arms team, dedicated to winning the direct ground combat fight."[79] Based upon this, current doctrine, and the employment of the system in Operation Desert Storm in 1991, MLRS met the criteria stated in the Department of Defense policy of January 1994 and the Department of the Army's implementation message of August 1994. Both the policy and implementation message clearly stated that field artillery battalions would remain closed to women because they would engage direct ground combat.[80]

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[78]Briefing, subj: The Field Artillery Launcher Force, Apr 99, pp. 1-27, Doc III-65; Memorandum, subj: None, Spring 99, Doc III-66.

[79]Briefing, subj: The Field Artillery Launcher Force, Apr 99, p. 28.

[80]Ibid., pp. 28-31.

Undeterred by the Field Artillery's and Army's position, DACOWITS persisted recommending opening MLRS units to women and even urged a personnel review of the issues by the Secretary of Defense.[81] "Deeply committed to supporting our country's military readiness and the appropriate utilization of the talents and abilities of all women and men in the military," DACOWITS forwarded its own analysis on the exclusion of women from MLRS units to General Baxter in October 1999 that was written following a January 1999 visit to Fort Sill by DACOWITS committee members.[82] After reviewing the Field Artillery's and Army's position that excluded women from MLRS units, the DACOWITS's analysis noted, "MLRS is a dynamic, demanding and important career field. It is possible to justify the exclusion of women from MLRS based on the 1994 Assignment Rule and Definition of direct ground combat; however, the exclusion is not necessarily compelled."[83] After expressing the justification ambiguously, the analysis concluded urging the Secretary of Defense to open MLRS units to women. Based upon this, DACOWITS again petitioned the Chief of Staff of the Army, General Eric K. Shinseki, to open MLRS to women.[84]

Subsequently, the Chief of Staff tasked the Field Artillery to make a response. In a briefing to general

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[81]Working Book Issue for Oct 99 DACOWITS Conference, Doc III-66A.

[82]Memorandum for Major General Leo Baxter, subj: DACOWITS Visit to Fort Sill, 11 Oct 99.

[83]Ibid.

[84]Ibid.

officers, the Field Artillery reiterated its position and Army policy but added a new twist. General Baxter's successor, Major General Toney Stricklin, outlined DACOWITS's position and reminded them that the Deputy Chief of Staff for Personnel, General Ohle, and the Assistant Secretary of the Army for Manpower and Reserve Affairs had endorsed the Field Artillery's position as recently as April 1999. Specifically, General Stricklin said Department of Defense Ground Combat Policy closed field artillery battalions to women based upon doctrine, experience, and experimentation and urged a strong response by the Army to close the issue.[85]

[85]CG Talking Points, 16 Oct 99, Doc III-67; Briefing, subj: DACOWITS and MLRS, Oct 99, Doc III-68; Email msg, subj: Input for CSA DACOWITS Response, 8 Oct 99, Doc III-69.

In a draft letter to DACOWITS, General Shinseki fundamentally repeated his predecessors position of 1998 and early 1999. After pointing out that the Army was undergoing a significant transformation, General Shinseki noted, "The nonlinear battlefield has made it more difficult to apply the terms 'combat' and 'non-combat' to define women's roles within the Army in the tradition manner."[86] He then added that the Army had to articulate better the basis for making decisions to open or close military occupational specialties and areas of concentration to women.[87]

**Intermediate Level Education**

In 1999 the Army started revamping its intermediate level education system that included the U.S. Army Command and General Staff College at Fort Leavenworth, Kansas, for majors and advanced education at a civilian college, training with industry, or qualification courses for lieutenant colonels and was programmed to begin in 2004. At the outset of the restructuring, the Army decided that it had to provide the right education to the right field grade officers at the right time in their careers and concluded that it would be a tailored, modular education with a common core. This would prepare field grade officers for the Army's operational needs. Under the previous Officer Personnel Management System (OPMS), fifty percent of a year group attended the Command and General Staff College in residence, and the other fifty percent took the non-resident Command and General Staff College course via correspondence and classroom attendance at an Army installation. Nearly one hundred percent of the majors who attended the Command and General Staff College in residence became branch qualified by filling an executive officer or operations officer position after attendance. Subsequently, eighty to ninety percent of these officers were selected for promotion to lieutenant colonel. In comparison, less than twenty percent of the majors who went through the non-resident Command and General Staff College course became

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[86] Ltr (Draft), Shinseki to Ms Mary J. Wamsley, Chair, DACOWITS, 18 Oct 99, Doc III-70.

[87] Ibid.

branch qualified. As a result, less than twenty percent of the officers who took the non-resident course were selected for promotion to lieutenant colonel. This basically meant that resident attendance was a prerequisite for promotion and later success.[88]

[88]Briefing, subj: Universal Military Education Level Study Phase III, 2 Apr 99, Doc III-71; Email msg with atch, subj: Intermediate Level Education, 21 Mar 00, Doc III-72.

OPMS XXI and intermediate level education reforms promised to change this practice. As explained in April 1999, fifty percent of a year group promoted to major would attend the Command and General Staff College in residence, and fifty percent would take the non-resident Command and General Staff College course as under the previous system. Of the Command and General Staff College attendees, one hundred percent would become branch qualified as majors in the operations career field, such as infantry, field artillery, aviation, and armor. Of those who went the non-resident route, one hundred percent of the majors would become branch qualified in the non-operations track, such as the operations support field, the information operations field, and the installation support field that had been created by the OPMS XXI reforms. Every major under OPMS XXI whether the individual attended the resident course or not could become branch qualified and have opportunities for future promotion to lieutenant colonel in their respective field.[89]

Moreover, other principles would govern intermediate level education. Majors could attend the resident course at the Command and General Staff College or take the Command and General Staff College course via the Total Army School System (TASS) distributed classroom method or the TASS correspondence course method. Prior to the lieutenant colonel board, a field grade officer would also have the opportunity to take advanced civilian schooling, training with industry, or qualification courses as appropriate to enhance promotion possibilities. Ultimately, how a field grade officer received intermediate level education that would consist of the intermediate level education common core (Command and General Staff College, TASS distributed classroom, and TASS correspondence) and career field/branch/functional area education at a civilian school, training with industry, or qualification courses would be

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[89]Briefing, subj: Universal Military Education Level Study Phase III, 2 Apr 99; Interview, Dastrup with LTC William A. Rigby, Chief, Field Artillery Proponency Office, 17 Mar 00, Doc III-73; Email msg with atch, subj: Intermediate Level Education, 21 Mar 00.

immaterial for promotion beyond major. Attendance at the Command and General Staff College would no longer be a determining factor for promotion and success in the future as it was in 1999 and would be distributed fairly among the four OPMS XXI career fields and not concentrated in the combat arms as has been the practice.[90]

[90]Briefing, subj: Draft Intermediate Level Education, 16 Mar 00, Doc III-73A; Email msg with atch, subj: Intermediate Level Education, 21 Mar 00.

Ensuring that each of the four career fields had its fair share of slots in the Command and General Staff College resident course under the intermediate level education format being advocated created a problem for the Field Artillery and other combat arms. In the past the fifty percent ratio meant that the Field Artillery would have sufficient number of graduates from the Command and General Staff College resident course to fill field grade positions of battalion executive officer, battalion operations officer, and brigade fire support officer and ultimately battalion command slots because fewer functional area officers attended the resident course. With the new formula that divided officers into operational and non-operational fields the Army reduced the number of Field Artillery positions at the Command and General Staff College resident course from eighty to forty five to give more seats to non-operational fields. The decreased number unfortunately failed to cover the number of available executive officer, battalion operations officer, and brigade fire support officer slots. As a result, the Field Artillery would have to use non-resident course graduates who did not receive the same amount of operations training to fill a portion of the slots.[91]

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[91]Interview, Dastrup with Rigby, 17 Mar 00; Briefing, subj: Field Artillery, 5 Apr 99; Briefing, subj: Universal Military Education Level Study Phase III, 2 Apr 99; Briefing, subj: Field Artillery Br-13, Mar 99, Doc III-74.

To prevent this from happening the Field Artillery urged revamping selection to the resident Command and General Staff College course with its emphasis on operations. The Field Artillery wanted only operational career field artillery officers to attend the resident course and desired to eliminate officers from the operations support field, the information operations field, and the installation support field from the course. This would increase the number of field artillery officers in attendance and would permit filling field artillery executive officer, operations officer, and brigade fire support officer slots with Command and General Staff College graduates with their strong training in operations and war fighting. Despite the compelling argument, the formula for filling seats in the resident course remained unchanged at the end of 1999. The Field Artillery would get forty-five seats and be forced to fill some of its executive, operations, and fire support officer positions with non-resident course graduates. However, the U.S. Army Training and Doctrine Command's Combined Arms Center at Fort Leavenworth created a team to study the proposal that essentially adopted the Field Artillery's position as the recommended future for intermediate level education development and urged the Deputy Chief of Staff for Personnel and the Department of the Army to provide the requisite resources. Until the resources were committed, the formula for selecting field grade officers to attend the resident course remained fairly divided among the four career groups and the Field Artillery would have to use non-resident course graduates to fill field grade operations, executive, and fire support officer slots.[92]

## EQUIPMENT

### Sense-and-Destroy-Armor-Munition

Early in the 1970s, the Army projected that the Warsaw Pact's future armored forces would be sophisticated. The Pact's combat formations would be composed of mixes of maneuver and armored vehicles, field artillery, logistical units, and command and control elements. Equally important, the Warsaw Pact would have the capability of employing highly technical target acquisition and electronic countermeasure devices.[93]

To offset the enemy's numerical superiority, the Army

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[92]Briefing, subj: Universal Military Education Level Study Phase III, 2 Apr 99; Briefing, subj: Field Artillery, 5 Apr 99; Briefing (Extract), subj: Untitled, 1999, Doc III-75; Interview, Dastrup with Rigby, 17 Mar 00; Email msg with atch, subj: Intermediate Level Education, 21 Mar 00.

[93]1994 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 120-21.

reasoned that it had to improve its fire support. The Army could increase the number of weapons, but manpower and monetary constraints discouraged taking this course of action. After further consideration the Army turned to upgrading training and technology as a means of enhancing fire support to exploit current and future resources more efficiently. As a vital part of enhancing fire support that included introducing new weapons, target acquisition systems, command and control systems, support systems, and doctrine, the Army initiated action to develop smart munitions (precision munitions) that could be steered to the target and that would be more deadly than existing conventional high-explosive fragmentation projectiles.[94]

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[94]Ibid., p. 121.

Besides introducing the Copperhead projectile, which required a laser designator to guide it to the target, the Army started work on the Sense-and-Destroy Armor (SADARM) munition, which was a fire-and-forget precision munition, at the beginning of the 1980s to counter enemy armor. The projectile would be delivered over the target where it would dispense submunitions that would orient, stabilize, and descend by parachute in a controlled spin, searching a circular area with a diameter of approximately 150 meters. When a submunition's infrared, active and passive millimeter wave sensors confirmed a target, the submunition's warhead would fire a self-forging tantalum penetrator to destroy the target upon impact.[95]

After several years of development on the 155-mm. SADARM, the Army conducted technical testing in 1993 to determine if low-rate production could begin during the fourth quarter of Fiscal Year (FY) 1993. Based upon the expected technical performance, the Army established a criteria of twenty-four hits from seventy-two submunitions. If SADARM met the effectiveness criteria, production would begin. However, technical difficulties during the June 1993 performance test led to a high dud rate and an insufficient number of hits (nine hits from seventy-two submunitions). As a consequence, the Army raised serious questions about the munition's reliability. The unexpected poor performance compelled the Army to halt the test and to cancel the Army System Acquisition Review Council (ASARC) and Defense Acquisition Board (DAB) that would convene to consider further development. In the meantime, the Multiple-Launch Rocket System (MLRS) SADARM experienced expulsion problems and an excessive number of duds.[96]

In view of the technical difficulties, the Army restructured the SADARM program in 1993-1994 and simultaneously encountered confusing guidance from Congress. In September 1993 the Army Acquisition Executive approved a proposal by the SADARM Program Manager to fix the problems and to test the munition again, which meant increasing developmental time. Meanwhile, a joint Senate and House Appropriations Committee appropriated money in FY 1994 to terminate the SADARM program, while a joint Senate and House Authorizations Committee provided money to conduct further analysis for a 155-mm. SADARM only. Based upon legal

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[95]Director, Operational Test and Evaluation, FY98 Annual Report (Extract), subj: SADARM, Doc III-75A; 1996 USAFACFS ACH, pp. 100-01; 1997 USAFACFS ACH, p. 66; Email msg, subj: SADARM Input to 1999 Annual Command History, 31 Mar 00, Doc III-75B.

[96]1995 USAFACFS ACH, pp. 103-04.

guidance, the Army directed the SADARM Program Manager to continue work on the munition, although confusion over the direction of the program existed.[97]

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[97] Ibid. pp. 104-05; Director, Operational Test and Evaluation FY98 Annual Report (Extract), subj: SADARM.

Intensive efforts by the SADARM Program Manager and the contractor corrected the technical problems. During the technical tests in April 1994, the munition scored eleven hits and eight near misses from the thirteen projectiles (twenty-six submunitions) fired at targets at a range of approximately fifteen kilometers. This success demonstrated that SADARM was technically mature and reliable as it approached the low-rate production decision in the second quarter of FY 1995.[98] The Chief of the Munitions Branch, TRADOC System Manager (TSM) Cannon, Directorate of Combat Developments (DCD), U.S. Army Field Artillery School (USAFAS), explained the importance of the accomplishments of 1994. Early in March 1995, he pointed out that the Program Manager's and the contractor's work brought the 155-mm. SADARM "back from the dead."[99]

Based on the Congressionally-directed Smart Munition Study conducted by the Field Artillery School in 1994, the Army, in the meantime, stopped all work on the MLRS variant of SADARM. Although the study reaffirmed the need for a field artillery smart munition, numerous alternatives existed for the MLRS variant, such as the Brilliant Antiarmor Preplanned Product Improved (BAT P3I) submunition. The final decision to defer work on the MLRS submunition, however, was based on a follow-on study entitled, MLRS Smart Tactical Rocket Study that identified BAT P3I as a viable alternative to a MLRS smart munition and halted work with the munition. The study also concluded that there were not any viable options to the 155-mm. SADARM.[100]

In the October 1994 Field Artillery, (formerly called the Field Artillery Journal until mid-1987) the Chief of the Munitions Branch clearly outlined the rationale for SADARM. He pointed out that the munition was a day-night, fire-and-forget, top-attack munition that would add a new dimension to "fighting with fires" and would dramatically enhance the

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[98]Director, Operational Test and Evaluation FY98 Annual Report (Extract), subj: SADARM.

[99]1995 USAFACFS ACH, p. 105.

[100]Ibid., pp. 105-06.

Army's force projection. Years of engineering had produced a munition that was more lethal than high-explosive munitions or dual-purpose improved conventional munitions (DPICM) and that was easier to employ than the Copperhead precision munition. In fact, gun crews could handle SADARM like any other 155-mm. projectile. Thus, at the end of 1994, the SADARM program was poised for Department of Defense approval to enter low-rate initial production.[101]

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[101]Ibid., p. 106.

Early in 1995, three separate decisions led to low-rate initial production in preparation for the Initial Operational Test and Evaluation in 1998. Based upon the munition's performance during the testing of April 1994 and the ASARC review of December 1994, on 13 January 1995 the Army Acquisition Executive, Gilbert F. Decker, approved the SADARM program to proceed to the Defense Acquisition Board (DAB) because the Department of Defense had oversight authority. However, he requested that the Program Manager pursue cost-reduction efforts to save the government money. On 30 March 1995 the DAB conducted a low-rate production review of the SADARM program. In view of the ASARC's decision and the Joint Requirement Oversight Council's validation of key performance parameters on 16 February 1995, the DAB approved entry into low-rate initial production. Likewise, the ASARC directed restructuring the program to reduce costs.[102]

Notwithstanding the decision to move into initial low-rate production, the Army and contractor still had one major concern with the performance of SADARM. During testing, the submunitions often collided after being ejected from the carrier projectile. To fix the shortcoming the contractor developed a belleville spring to separate the submunitions when they were ejected. Although subsystem testing in the summer and fall of 1995 indicated that the spring functioned properly, the Field Artillery School and contractor were waiting official recognition at the end of 1995 that the shortcoming had been fixed.[103]

Tests in 1996 and 1997 validated the improvements to SADARM. In April and May 1996 during Engineering and Verification Tests at Yuma Proving Ground, Arizona, SADARM produced eight hits from nine projectiles. Subsequently,

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[102]Director, Operational Test and Evaluation FY98 Annual Report (Extract), subj: SADARM; 1996 USAFACFS ACH, p. 104; 1997 USAFACFS ACH, p. 68.

[103]1995 USAFACFS ACH, pp. 106-07.

SADARM first-article testing at Yuma Proving Ground in December 1996 yielded five hits from four projectiles (eight submunitions). During Initial Production Tests in the summer and early winter of 1997 at Yuma Proving Ground and the Cold Region Test Center, Alaska, SADARM's performance exceeded the Army's expectations to permit moving into operational testing in mid-1998 and towards the ASARC of December 1998.[104]

[104]Director, Operational Test and Evaluation FY98 Annual Report (Extract), subj: SADARM; 1996 USAFACFS ACH, p. 105; 1997 USAFACFS ACH, pp. 68-69; Fact Sheet, subj: SADARM, Apr 98, Doc III-102, 1998 USAFACFS ACH; Fact Sheet, subj: SADARM, Feb 99, Doc III-103, 1998 USAFACFS ACH.

Work on SADARM continued into 1998 and 1999 with a focus on improving the reliability of the submunitions. During the initial operational test and evaluation of August 1998, SADARM performed at a lower level than anticipated to demonstrate that it was not operationally effective. Because of this, the Army oriented the SADARM program towards enhancing reliability of the submunitions, decided to conduct additional testing in 1999 to evaluate corrections to major failures, and inserted a limited user test into the basic SADARM program for the third quarter of FY 2000.[105]

After additional work on the submunition's reliability, the Army conducted intensive testing at Yuma Proving Ground during three days of firing on 31 August-2 September 1999. The test firings, which were part of a two-phase program to ensure the reliability of SADARM submunitions for the limited user's test, demonstrated a significant increase in reliability and lethality. As the U.S. Army SADARM Project Manager, Colonel Bernard E. Ellis, noted, the tests provided the Army with solid evidence that M898 SADARM exceeded its operational requirements and promised a successful limited users test in April 2000.[106]

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[105]Fact Sheet, subj: XM892 Extended Range Projectile, Feb 99, Doc III-104, 1998 USAFACFS ACH; Fact Sheet, subj: SADARM, Feb 99; Fact Sheet, subj: SADARM, Apr 98; Memorandum for Dick McKean, TSM Cannon, subj: SME Review of SADARM Portion of 1998 Annual Command History, 18 Feb 99, Doc III-105; Director, Operational Test and Evaluation Annual Report FY98 (Extract), subj: SADARM; Email msg, subj: SADARM Historical 99, 30 Mar 00, Doc III-75BB.

[106]"SADARM Successful in U.S. Army Reliability Tests,"

Journal of Aerospace and Defense Industry News, 11 Feb 00, http://aerotechnews.com/starc/2000/021100/SADARM.html, Doc III-75C; "SADARM Smart Munition Achieves 25 Direct Hits," Defense Briefing, 16 Sep 99, http://www.defensebriefing.com/lc-14.htm, Doc III-75D; Email msg, subj: SADARM Historical 99, 30 Mar 00.

Meanwhile, the Army initiated a product improvement (PI) program in 1998-1999 that would lead to fielding a SADARM PI M898E1 with improved sensors, a larger footprint, and increased lethality. The SADARM PI munitions would also be fielded in the extended range XM892 projectile. However, a loss of production money for basic and SADARM PI in 1999 because money was being put into other munitions threatened to stall development and prevent putting the SADARM PI in the XM892. Exhibiting confidence in SADARM, however, the Deputy Director of TSM Cannon pointed out that the limited user's test in April 2000 should convince the Army to put more money back into the munition to get it on track.[107]

**Crusader Self-Propelled 155-mm. Howitzer**

Initially part of an ambitious acquisition program in the 1980s aimed at reducing procurement and sustainment costs by introducing a family of armored vehicles mounted on a common chassis, the Crusader, a self-propelled 155-mm. howitzer, and its resupply vehicle promised to revolutionize cannon field artillery and to serve as the next-generation self-propelled howitzer. Even though studies conducted late in the 1970s and early in the 1980s recognized the need for Crusader, the U.S. Army Field Artillery School (USAFAS) validated the requirement for the howitzer and its resupply vehicle once again in the 1990s. According to TRADOC System Manager (TSM), Cannon, in the Directorate of Combat Development (DCD), the system would give the Army a dynamic warfighting capability. The M109A2/A3 self-propelled 155-mm. howitzer and its successor, the M109A6 Paladin self-propelled 155-mm. howitzer, lacked sufficient mobility, survivability, lethality, and effectiveness for combat in the twenty-first century. In all areas of concern, the Crusader exceeded the capabilities of the other two howitzers significantly and would be the premier cannon system in the world upon being fielded in 2005.[108]

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[107]Fact Sheet, subj: XM982 Extended Range Projectile, Feb 99, Doc III-104, 1998 USAFACFS ACH; Fact Sheet, subj: SADARM, Feb 99; Fact Sheet, subj: SADARM, Apr 98; Memorandum for Dick McKean, TSM Cannon, subj: SME Review of SADARM Portion of 1998 Annual Command History, 18 Feb 99, Doc III-105, 1998 USAFACFS ACH; Director, Operational Test and Evaluation FY98 Annual Report (Extract), subj: SADARM; Interview, Dastrup with Doug Brown, Dep Dir, TSM Cannon, 3 Mar 00, Doc III-75E; Email msg, subj: SADARM Historical 99, 30 Mar 00; "SADARM Smart Munition Achieves 25 Direct Hits," Defense Briefing, 16 Sep 99; "SADARM Successful in U.S. Army Reliability Tests," Aerotech News and Review, 11 Feb 00.

[108]1995 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 113-14; Report (Extract), subj: Army Heavy Force Modernization Plan, 1998,

p. F1, Doc III-106, 1998 USAFACFS ACH. To minimize confusion the name "Crusader" will be used when referring to the howitzer and its resupply vehicle. Through the early 1990s, the Crusader was called the Advanced Field Artillery System and the resupply vehicle was called the Future Armored Artillery Resupply Vehicle. Both were separate programs. See Paul F. Pearson's and Glenn K. Otis's "Crusader: Linchpin of the Force XXI Army," Army, Nov 96, pp. 45-47, for an interesting discussion about the rationale for Crusader by two retired Army officers.

As demonstrated by Operation Desert Storm early in 1991, moreover, the Army critically required a new field artillery system to replace the M109A2/A3 because the Paladin that was scheduled to be fielded shortly would provide only a temporary solution. Of the three combat arms (Infantry, Field Artillery, and Armor), the Field Artillery had the most obsolete systems. Yet, the Armored Systems Modernization program as it was structured through mid-1991 made Crusader the fourth priority behind the Block III tank, the Future Infantry Fighting Vehicle, and the Combat Mobility Vehicle.[109]

In view of this incongruity with reality, a General Accounting Office (GAO) report and the Senate Armed Services Committee's Fiscal Year (FY) 1992 budget report severely questioned the Army's priorities. Pressured by the General Accounting Office report and the Senate Armed Services Committee, the Army revamped its Armored System Modernization program. On 30 October 1991 the Army sent Congress a position paper that explained a reordering of priorities. The Army deferred further development on the Block III Tank, the Future Infantry Fighting Vehicle, and the Combat Mobility Vehicle. Options to resume development on the systems would be left open to meet the threat, while key components -- cannon research and engine development -- would be retained in the technology base for continued development. Developing the Crusader became the number one priority for the armored forces.[110]

As development on the gun, propellant, and chassis moved forward during the 1990s, USAFAS confronted the issue of examining alternative self-propelled 155-mm. howitzers to the Crusader. In January 1995 the Milestone I Acquisition Decision Memorandum for Crusader, written by the Office of the Secretary of Defense, required the Army to evaluate foreign

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[109]1995 USAFACFS ACH, p. 114.

[110]Ibid., pp. 114-15.

systems, specifically the German PzH2000 self-propelled 155-mm. howitzer, to gain a better appreciation of the Crusader. Subsequently, in November 1995 the Army tasked the Project Manager for Crusader to determine if the PzH2000 met the requirements for Crusader.[111]

[111] Ibid., pp. 112-13.

This assignment led to a series of meetings in 1996 with the prime German contractor, Wegmann GmBH, and the German army, who were seeking potential foreign buyers. In May 1996 the Assistant Secretary of the Army for Research, Development, and Acquisition, Herbert K. Fallin, Jr., directed the Army to conduct a two-phase investigation to determine if the PzH2000 could be used as a Crusader. While Phase I, called the "quick look assessment," would provide a benchmark for future analysis, Phase II would be an in-depth analysis. Subsequent to Mr. Fallin's tasking, a team from the Directorate of Combat Developments, USAFAS, visited Germany late in June 1996 for a "quick look" assessment of the PzH2000. Although discussions with the Germans at that time disclosed significant differences between the American and German methods of collecting data, one team member concluded, "The PzH2000 is a very capable system that meets the needs of the German army."[112] The visit also revealed that howitzer could be modified to meet some Crusader requirements but that it could not meet all of them. For example, the PzH2000 did not have a companion resupply vehicle, lacked a cannon cooling system that was required to provide continuous fire support to shape the battle and support surge and peak battle conditions, had a lower rate of fire, was less accurate, and had a five-person crew whereas the Crusader had a three-person crew.[113]

Although the Germans insisted that they could modify the howitzer to meet the Army's requirements, the Army still opposed adopting it. On 6 December 1996 Mr. Fallin explained, "There are two principal reasons why the PzH2000 as a system does not meet our Crusader Objectives."[114] First, the Crusader required a cooled cannon. Second, the reduction in operational costs in crew size from the Paladin to Crusader was imperative because of projected budgets. "Although it may be possible to grow the PzH2000 system to meet Crusader

[112] Ibid., p. 114.

[113] Ibid., pp. 113-14.

[114] Ibid., p. 115.

requirements," Mr. Fallin added, "the analyses that we have shared with you suggest that this would not be the most efficient path to procure a system that meets our requirements."[115] Even so, the Army would still conduct a Phase II analysis in the near future to complement the Phase I analysis completed in 1996.[116]

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[115] Ibid.

[116] Ibid.

One day later, Under Secretary of Defense, Dr. Paul G. Kaminiski, reaffirmed the Army's position. In a letter to the German Minister of Defense, Dr. Kaminiski recognized the possibility of cooperating with the Germans in developing the Army's next-generation howitzer. After hearing the advantages and disadvantages of working with the Germans and using the PzH2000, he wrote, "In the end, however, the issue became one of the rate of fire that each gun could achieve and sustain. Our Army is convinced that the requirement they have stated for a sustained rate of fire must be achieved."[117] Dr. Kaminiski then noted, "While there is a possibility the PzH can be modified to meet this same requirement, that kind of modification would be essentially a new and much different program that could not offer the research and development savings necessary to justify a decision to procure PzH2000."[118] Given the costs, Dr. Kaminiski declined the German offer of using the PzH2000. Notwithstanding this, the Army should retain the PzH2000 as a backup should the Crusader "encounter serious technical difficulties."[119]

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[117] Ibid., p. 116.

[118] Ibid.

[119] Ibid.

In its report of June 1997, the General Accounting Office (GAO) reviewed the Crusader program to determine its status and the availability of an alternative, such as the PzH2000. After conducting extensive interviews with varying levels of Army command and private industry in 1996-1997, the GAO concluded, "No existing artillery system meets all of the Crusader requirements."[120] Notwithstanding its favorable report, the GAO acknowledged that the Crusader program faced considerable programmatic risks. More specifically, the technical challenges faced in developing and integrating advanced technologies, the potential compression of the program's schedule of development, and the absence of defined criteria for entering into low-rate initial production and full-rate production could jeopardize fielding the system.[121] To minimize the risk of prematurely entering into production, the GAO report recommended that the Secretary of Defense should direct the Secretary of the Army to establish criteria specifying, at a minimum, that the Crusader system should demonstrate its ability to meet all key requirements, that it was on schedule for satisfying it reliability requirements before entering low-rate initial production, and that it was operationally effective and suitable before entering full-rate production. If the requirements could not be met, an alternative system could be considered. This left open the option of adopting the PzH2000, but this was not a viable consideration as far as the Army was concerned because the German howitzer failed to meet its needs.[122]

Shortly afterwards, an article in Defense Daily on 21 October 1997 came to the defense of the German howitzer. It argued that the German PzH2000 would meet the needs of the Army after being improved and would be a less expensive than the Crusader. In a series of meetings and briefings during the remaining months of 1997 with congressional staffers, the Army addressed the article's contentions. Among other things, the Army pointed out that the PzH2000 would not provide revolutionary technology to support the force well into the next century, that PzH2000 modifications would still fall short of the Crusader's, and that they would not provide savings. In fact, the PzH2000 was essentially a 1990 howitzer with serious mission deficiencies that precluded consideration. The howitzer was heavy, lacked automated loading capabilities, and was still to a great extent a manual

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[120]General Accounting Office Report, subj: Army Armored Systems, Jun 97, p. 10.

[121]1997 USAFACFS ACH, pp. 74-75.

[122]Ibid., p. 75; GAO Report, subj: Army Armored Systems, Jun 97, p. 11.

system. Ultimately, the PzH2000 failed to meet Crusader requirements, nor could it meet them with the modifications. In view of this, as far as the Army was concerned, the Crusader remained the future howitzer of choice because it would have a state-of-the-art cockpit with embedded command and control that would permit the crew to fight the system to its maximum potential, would have a robust cannon that would not overheat, would have a reliable ammunition loading system, and would have a powerful engine to keep the field artillery force up with the maneuver forces. From the Army's perspective based upon research, the Crusader would last at least forty years.[123]

[123] 1997 USAFACFS ACH, pp. 75-76.

In a briefing given at the direction of the Office of the Deputy Chief of Staff for Operations and Plans on 2 October 1997, the Project Manager for Crusader and the TSM Cannon from Fort Sill continued defending Crusader from its detractors. They pointed out that Paladin was a success story, but it was manpower intensive, lacked sufficient lethality, lacked the mobility of the supported force, and was a survivability risk. The Army simply required a more lethal, mobile, and survivable cannon system to meet the needs of the future because the Paladin would not be able to support Army XXI or the Army After Next. Equally important, the existing method of developing the system was cost effective and innovative to ensure that the Crusader satisfied the user's requirements at the best possible price in light of budget cuts.[124]

About the same time as the briefing, the National Defense Panel questioned the rationale for the system in light of funding restraints and even urged reducing the number of Crusaders to be produced. This proposal caused the Commandant of the Field Artillery School, Major General Leo J. Baxter, to come to the defense of the system. In letters to members of the panel, General Baxter explained, "Crusader is a world-class artillery system for the 21st century. . . . As the Chief of Field Artillery, I am somewhat in awe of Crusader's potential. It is a revolutionary fire support platform."[125] Although a direct impact of the letters was not felt in 1997, they represented a part of the Army's and the School's effort to sell the Crusader and avert possible elimination of the system, given the budget situation.[126]

Just as budgetary considerations raised the specter of finding a less expensive alternative weapon system or reducing the number of Crusaders to be developed and modifying the Acquisition Program Baseline schedule, they also drove a reconsideration of the system's design. A "Gray Matter Team" composed of the TRADOC System Manager, the Project Manager for Crusader, and the contractor met several times over a period of several months in 1997 to review the system's requirements, the state of development, and the program objectives and to recommend the optimum balance of cost, weight, and performance parameters. Based upon their findings, the team's recommendations urged adjusting the requirements to ensure system growth and cost effectiveness in an era of budgetary constraints and led to changes in the operational requirement document. As the team's work suggested, funding lay at the heart of Crusader issues in 1997. Notwithstanding threats to

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[124]Ibid., p. 76.

[125]Ibid.

[126]Ibid., pp. 76-77.

the system caused by budget cuts, a System Level Review on 16-18 December 1997 verified that development was moving forward as scheduled.[127]

Based upon the steady progress in developing the required technology over the past several years and an Army requirement, the Program Executive Officer for Ground Combat and Support Systems and the Chief of Field Artillery, Major General Leo J. Baxter, evaluated the Crusader program early in 1998 to determine its future. On 12 March 1998 they officially announced:

[127] 1997 USAFACFS ACH, p. 77.

> We are satisfied with the progress that has been made and with the ability of the design to meet the Crusader system requirements. We authorize the Project Manager and TRADOC [U.S. Army Training and Doctrine Command] System Manager to continue with development of the Crusader system.[128]

This decision approved the system design and authorized the fabrication of two prototypes of the howitzer for delivery in December 1999 and two prototypes of the resupply vehicle for delivery in July 1999 to support technical and operational testing.[129] According to the Crusader project officer in TSM

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[128]Memorandum for Project Manager, Crusader, and Cmdt, U.S. Army Field Artillery Center, subj: PEO for Ground Combat and Support Systems and Commandant of U.S. Army Field Artillery School In-process Review of the Crusader System, 12 Mar 98, Doc III-109, 1998 USAFACFS ACH.

[129]Fact Sheet, subj: Crusader, Feb 99, Doc III-110, 1998 USAFACFS ACH; "Crusader Update," Field Artillery, Mar-Apr 98, p. 11; "Crusader Update," Field Artillery, May-Jun 98, p. 41, Doc III-111, 1998 USAFACFS ACH.

Cannon in the Field Artillery School, the decision also took one more step towards ensuring that today's second lieutenants and privates would, indeed, have a world-class weapon with which to win quickly and decisively in any conflict of the next century.[130]

[130]"Update," Field Artillery, May-Jun 98, p. 41.

As many others involved with the Crusader system had already done, the project officer at the Field Artillery School explained the revolutionary nature of the howitzer shortly after the decision to develop the hardware had been made. The self-propelled howitzer's digitized cockpit would ensure that the system would become an all-encompassing fighting platform, would be fully integrated in the tactical Internet, would be able to exploit information dominance, and would be its own fire direction center. With this latter characteristic the Crusader would eliminate the requirement for platoon, battery, and battalion fire direction centers and would raise the qualifications necessary for cannon crew members by moving fire direction center and tactical decision-making functions to the weapon. This basically meant that crew members would need training with tactical Internet operations, tactical fire direction readouts, and mechanical and electronic diagnostic and prognostic readouts.[131]

Notwithstanding this, funding threatened to stall progress. The Defense Authorization Act for Fiscal Year (FY) 1999 withheld funding until five critical issues were resolved favorably and reported to Congress by 1 March 1999. Once again, the Army and Field Artillery had to defend Crusader against detractors. In a report of February 1999, they answered the issues raised by Congress and explained that Crusader would be the first American howitzer since World War One that would be superior to other 155-mm. self-propelled howitzers, that it would fill an urgent void, that it would provide critical support for the Army and Joint Vision 2010, that it would satisfy Division XXI design requirements, that it would deliver the optimum balance of cost and performance, and that it would clearly furnish a revolution in tactical fires. This reasoning convinced Congress of the Crusader's importance to future warfighting, fostered support, and gained funding for the system.[132]

Meanwhile, as outlined in the U.S. Army Training and Doctrine Command's Heavy Force Modernization Plan, written at

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[131]"Crusader Update," p. 41. See Rupert Pengelley's "Battling with Tactical Internets," Jane's International Defense Review, Feb 00, pp. 44-50, Doc III-28, for more information on the tactical Internet.

[132]Briefing, subj: Crusader: FY99 Authorization Language Report to Congress, Fall 98, Doc III-112, 1998 USAFACFS ACH; Interview, Dastrup with MAJ Gerald W. Lucas, TSM Cannon, 4 Feb 99, Doc III-113, 1998 USAFACFS ACH; MAJ Donald L. Barnett, "Crusader Report to Congress," Field Artillery, Nov-Dec 99, pp. 14-18, Doc III-77; Crusader: A Report to the Congressional Defense Committees, Feb 99, Executive Summary, Doc III-78.

the direction of Congress during the latter months of 1998, the Army would procure 1,138 Crusaders during the first two decades of the twenty-first century. This number would equip twenty-two active component battalions, twenty-six Army National Guard battalions, and eight prepositioned sets and would furnish howitzers for the training and logistics base. Fielding would begin in FY 2005 by fielding division artilleries and their supporting field artillery brigades in complete packages. As a result, active component and Army National Guard units would be equipped concurrently.[133]

[133]Report, subj: Heavy Forces Modernization Plan, 1998, p. F1; Director of Operational Test and Evaluation FY99 Annual Report (Extract), subj: Crusader, Doc III-79.

In June 1999 Fort Sill received good news about Crusader. That month United Defense L.P. announced its intentions to construct a state-of-the-art assembly facility in Elgin, Oklahoma, which was located adjacent to Fort Sill's East Range. In 2004 the first production version of the howitzer was scheduled to roll out of the facility and onto Fort Sill's East Range where field artillerymen and contractors would test it. According to General Baxter, the Elgin site made good sense. Most of the Crusaders would be used at Fort Sill and Fort Hood, Texas. Assembling them near Fort Sill would facilitate training and testing.[134]

Even before the enthusiasm of the Elgin facility could wear off, another crisis enveloped the Crusader. After becoming Chief of Staff of the Army in the summer of 1999, General Eric K. Shinseki officially announced on 12 October 1999 his objective to make the Army a more strategically responsive force. To do this he planned to develop a force that would be deployable, agile, versatile, lethal, survivable, sustainable, and dominant at every point along the spectrum of operations and concurrently established the goal of deploying a combat-capable brigade anywhere in the world within 96 hours after liftoff, a division on the ground in 120 hours, and 5 divisions within 30 days.[135]

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[134]"FA Chief: Crusader Program Viable, Has Great Support," Fort Sill Cannoneer, 21 Oct 99, pp. 1a, 2a, Doc III-80; "Elgin Wins Crusader Assembly Plant," Fort Sill Cannoneer, 24 Jun 99, pp. 1b, 2b, Doc III-81.

[135]"Army Announces Vision for the Future," U.S. Army

News Release, 12 Oct 99, Doc III-82; Vision Statement, 23 Jun 99, Doc III-83.

As might be expected, the drive to create a more strategically deployable force had critical implications with the existing Crusader program late in 1999. Considered to be too heavy by many within the Army for the medium-weight forces envisioned by General Shinseki, the Army contemplated terminating the Crusader to save money for the new medium brigade and suitable systems. Hard work by the Field Artillery School, in particular TSM Cannon, and negotiations during the last two months of 1999 prevented eliminating the Crusader, although several programs, including the Multiple-Launch Rocket System Smart Rocket and the Army Tactical Missile System Block IIA, were canceled to help fund the medium-weight brigades to be formed and their equipment and weapon systems.[136]

Because General Shinseki disliked the Crusader's and the resupply vehicle's weight but liked its capabilities and wanted it to be an integral member of the Army's dominant maneuver force, the Army revamped the Crusader program beginning in December 1999 to make the self-propelled howitzer and its resupply vehicle lighter and more strategically deployable. Restructuring involved decreasing the overall weight of the self-propelled howitzer from 55 tons to 38-42 tons and the resupply vehicle from 50 tons to 38-42 tons to permit loading two self-propelled howitzers or two resupply vehicles on a C-5B aircraft and carrying them 3,200 nautical miles but retaining the key performance parameters. To reach the weight restrictions the Army planned to replace the current vehicle structure and components with lighter weight materials, to utilize modular add-on armor kits to augment the basic hull and turret structure to enhance protection against specific regional threats, to reduce the ammunition and fuel payload, and to utilize a lightweight engine that would be common with the Abrams tank. This would permit reducing the length and width of the vehicles and create additional weight savings. Also, the Army outlined developing a wheeled version of the resupply vehicle that would weight 38-42 tons and would increase road speed, slipped fielding back from 2005 to 2008 to develop the technology and to make the necessary modifications to the program, and intended to use the Crusader as a technology base for other systems. Because the reduced weight Crusader would not be suitable for the medium brigades, the Army determined to give it to the counterattack corps (III Armored Corps) and to field only 480 Crusaders and resupply

[136]Email msg with atch, subj: Crusader, 5 Jan 00, Doc III-84; Email msg with atch, subj: Special Report, 4 Jan 00, Doc III-85; Interview, Dastrup with MAJ Stephen Hitz, TSM Cannon, 7 Mar 00, Doc III-86; "Secretary of the Army Says Crusader Still Viable," ArmyLink News, 15 Nov 99, Doc III-87.

vehicles. This was down from 1,138 that would have been fielded to the active component and part of the Army National Guard.[137]

**Lightweight Towed 155-mm. Howitzer**

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[137]Email msg with atch, subj: Crusader, 1 Mar 00, Doc III-88; Email msg with atch, subj: Crusader, 5 Jan 00; Email msg with atch, subj: Special Report, 4 Jan 00; Email msg with atch, subj: Future of Heavy Systems, 6 Jan 00, Doc III-89; Interview, Dastrup with Hitz, 7 Mar 00; Director of Operational Test and Evaluation, FY 99 Annual Report (Extract), subj: Crusader; MAJ Donald L. Barnett, "Crusader Target Weight: 38 to 42 Tons," Field Artillery, Mar-Apr 00, pp. 34-36, Doc III-89A.

When the United States shifted its national defense priorities from forward-deployed forces in Europe to force projection from the continental United States (CONUS) early in the 1990s when the Cold War ended, lightweight weapons attracted the Army's interest more than before. Lightweight weapons were more strategically and tactically deployable than heavier weapons. In view of the new world order and the drive for strategically deployable equipment, the Army wrote an Operational and Organizational Plan in 1991 for a lightweight towed 155-mm. howitzer, called the Advanced Towed Cannon System (ATCAS), to replace the aging M198 towed 155-mm. howitzer.[138]

To accomplish its mission of conducting expeditionary operations across the entire spectrum of conflict throughout the world, the U.S. Marine Corps, in the meantime, wrote a Joint Service Operational Requirement in 1989 for a lightweight, towed 155-mm. howitzer to provide close and long range fire support to the maneuver forces. At the time the Marine Corps employed the towed M101A1 105-mm. howitzer, which was adopted in 1939 and was 1920s technology, as a contingency weapon for certain missions because the M198 was too heavy. Although the M101A1 did not have the desired lethality and range, it provided the mobility needed by highly maneuverable ground forces in raid or rapid action scenarios. However, the weapon was only marginally supportable because of its age and maintainability. In light of this and new Department of Defense acquisition regulations, the Marine Corps replaced the Joint Service Operational Requirement of 1989 with an approved

[138]1995 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 121-22; See General Accounting Report, subj: Army and Marine Corps M198 Howitzer, Dec 95, Doc III-89B, for background information,.

Mission Need Statement in May 1993 for a lightweight, towed 155-mm. howitzer to supplant the M198 and M101A1.[139]

[139]Ibid., pp. 122-23.

Given the common need for a lightweight towed 155-mm. howitzer, the Army and the Marine Corps joined forces. In October 1993 they signed a memorandum of agreement that outlined the system's desired characteristics. The howitzer would have a maximum weight of nine thousand pounds and a capability of firing rocket-assisted projectiles to a range of thirty kilometers. According to the memorandum, the Army would take the lead in defining the detailed requirements for the howitzer. This would be done through an early user-sponsored study to establish an analytical basis and cost effectiveness of the system, to evaluate the potential of existing lightweight 155-mm. howitzer prototypes that had been built by various contractors, and to explore labor-saving and tactical efficiencies possible through improved technologies. The study ultimately would lead to a refined, detailed statement of the joint requirement to allow the development of a Joint Operational Requirements Document.[140]

Meanwhile, the Field Artillery School wrote a draft Mission Need Statement for the Advanced Towed Cannon System, renamed the Lightweight 155-mm. Towed Howitzer in 1996 and XM777 in 1997, for the Army in 1993-1994. Because the Army did not want a separate Mission Need Statement and because the Marine Corps Mission Need Statement adequately stated the basic requirements for the weight, range, and weapon capabilities that the Army needed, the U.S. Army Training and Doctrine Command (TRADOC) requested the U.S. Army Field Artillery School to explore endorsing the Marine Corps's Mission Need Statement or developing a joint Mission Need Statement with the Marine Corps.[141] Recognizing that the Marine Corps did not want to write a new Mission Need Statement and that the basic requirements for the howitzer were identical for both services, the Field Artillery School recommended in May 1994 that the Army should adopt the Marine Corps's Mission Need Statement to simplify acquiring a new towed howitzer and sent the Statement to TRADOC.[142]

Upon approving the Statement in June 1994 after arriving at the same conclusions that the Field Artillery School had reached, TRADOC forwarded it to the Department of the Army. Based upon TRADOC's recommendation and a review of the Marine Corps's Mission Need Statement, the Department of the Army

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[140]Ibid., p. 123; 1997 USAFACFS ACH, p. 78.

[141]1995 USAFACFS ACH, pp. 123-24; 1997 USAFACFS ACH, pp. 78-79.

[142]1996 USAFACFS ACH, p. 124. See Memorandum for Cdr, TRADOC, subj: USAFAS Endorsement of the USMC Mission Need Statement for a Lightweight 155-mm Towed Howitzer, 3 May 94, Doc III-114, for additional information, 1998 USAFACFS ACH.

approved it for use in September 1994 and took the lead in developing the lightweight 155-mm. howitzer operational requirements document with support from the Marine Corps.[143]

[143]1996 USAFACFS ACH, pp. 124-25.

Over the next eighteen months, key events with the system occurred. In February 1995 the Assistant Secretary of the Navy for Research, Development, and Acquisition approved moving the lightweight 155-mm. towed howitzer program into the Concept Exploration and Definition Phase and outlined the need for a shoot off between candidate 155-mm. systems. On 29 September 1995 the Army approved the Joint Operational Requirements Documents that outlined the system's characteristics. Five months later in February 1996, the Assistant Secretary of the Navy for Research, Development, and Acquisition sanctioned moving the program into the Engineering and Manufacturing Development phase (EMD).[144]

Although a joint program existed to produce a lightweight, towed 155-mm. howitzer for the Army and Marine Corps, one basic difference existed between the two services' objective system. Because the Marine Corps had an immediate requirement for a towed 155-mm. howitzer to replace the M198 and M101, it decided to field a howitzer without digital capabilities. The Army's lightweight 155-mm. towed howitzer, in comparison, would be fully digitized and would be introduced later than the Marine Corps's. However, the Marine Corps planned to digitize their lightweight 155-mm. towed howitzer through product improvement programs subsequent to fielding.[145]

Although the biggest obstacles to digitization were weight restrictions, power requirements, and the need to harden the automated systems to withstand weather and operational conditions, technology solved the problems. In 1996 modern electronics made possible an onboard computer with an integrated radio modem and an onboard power supply. Linked with a single-channel ground and airborne radio system (SINCGARS), the computer would furnish rapid, secure

[144] Ibid., p. 125; 1997 USAFACFS ACH, p. 79.

[145] 1996 USAFACFS ACH, pp. 125-26.

communications to the fire direction center or platoon operations center and directly to target acquisition sources. Ultimately, the computer would improve responsiveness and increase accuracy, lethality, and survivability.[146]

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[146]*Ibid*., p. 121.

In the meantime, the Joint Program Manager for the weapon system conducted a series of tests in 1996. Four contractors passed the initial screening criteria. They were Vickers Shipbuilding and Engineering Limited (VSEL), Royal Ordnance, Lockheed-Martin Defense Systems, and Lewis Machine and Tool Incorporated. In May 1996 Lewis Machine and Tool Incorporated was disqualified because its prototype had actually been constructed by a government arsenal. Subsequently, Lockheed-Martin Defense Systems dropped out of the tests because its prototype had too many technical difficulties to be competitive. By the time that testing had ended, only Vickers and Royal Ordnance remained in contention. For three months in 1996, B Battery, 3rd Battalion, 321st Field Artillery from Fort Bragg, North Carolina, and L Battery, 3rd Battalion, 11th Marine Regiment from Twenty Nine Palms, California, conducted operational testing on the contractor howitzers.[147]

Based upon the test results and the ability to meet development time lines and costs, the U.S. Government awarded the contract to the team of Vickers and Textron Marine and Land Systems in 1997 with the latter being the prime contractor for engineering, manufacturing, and development to refine Vicker's ultra lightweight field howitzer prototype so that it could be massed produced by industry and be a suitable replacement for the M198 towed 155-mm. howitzer. Funded by the U.S. Marine Corps, the contract stipulated the delivery of eight nondigitized howitzers for operational testing in 1999. If the eight howitzers passed the tests conducted by the Marine Corps to ensure that the design satisfied the joint operational requirements, production of 526 nondigitized howitzers for the Marine Corps would begin with a first unit to be equipped in mid-2002. Retrofitting them with digitized capabilities would come later. Subsequently, the Army would receive 273 digitized howitzers in 2005.[148]

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[147]Ibid., pp. 121-22; Interview, Dastrup with John Yager, LW155 Project Manager, TSM Cannon, 10 Feb 99, Doc III-115, 1998 USAFACFS ACH; "New USMC Towed Howitzer," Field Artillery, Jul-Aug 98, p. 37, Doc III-116, 1998 USAFACFS ACH.

[148]1997 USAFACFS ACH, p. 80; Interview, Dastrup with

John Yager, 10 Feb 99; "New USMC Towed Howitzer," p. 37.

In 1998 funding problems forced a revision of the lightweight 155-mm. towed howitzer contract and set back development a few months. Unable to continue work because it had run out of funding, Textron Marine and Land Systems requested in August 1998 to be relieved of its responsibilities as prime contractor. After lengthy legal discussions with Textron, the U.S. government agreed in September 1998 to accept the company's request and permitted Vickers to become the prime contractor to finish the remaining engineering and manufacturing development phase work. On 21 December 1998 Vickers (GEC Marconi Land and Naval Systems) officially announced that it had taken over as the prime contractor and was prepared to keep the project going through production.[149]

In the meantime, the Field Artillery School and the XVIII Airborne Corps at Fort Bragg, North Carolina, integrated a battery of towed 155-mm. automated howitzers in the Rapid Force Projection Initiative Advanced Concept Technology Demonstration (RFPI ACTD) at Fort Benning, Georgia, in July-August 1998.[150] They wanted to determine how much more effective and survivable the M198 with a Digital Fire Control System was than the standard M198. During the RFPI ACTD, C Battery, 1-377th Field Artillery, an XVIII Airborne Corps general support asset stationed at Fort Campbell, Kentucky, demonstrated the capabilities of the Digital Fire Control System through field exercises and simulation with encouraging results. Assessing the howitzer's performance, Lieutenant General William F. Kernan, Commanding General of the XVIII Airborne Corps, wrote, "During the conduct of the Rapid Force Projection Initiative Advanced Concept Technology Demonstration Field Experiment, the . . . Automated Howitzer

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[149]Interview, Dastrup with John Yager, 10 Feb 99; Press Release, U.S. Lightweight Howitzer Program Engineering and Manufacturing Development, 21 Dec 98, Doc III-117, 1998 USAFACFS ACH; Fact Sheet, subj: LW 155-mm. Howitzer, Apr 99, Doc III-89A; Fact Sheet, subj: LW 155-mm. Howitzer, Mar 00, Doc III-90.

[150]Memorandum for Record, subj: Input from John Yager, LW155 Automated Howitzer Project Officer, TSM Cannon, 10 Feb 99, Doc III-118, 1998 USAFACFS ACH; Memorandum for Deputy Assistant Secretary of the Army for Research and Development, subj: USAFAS Support for the RFPI ACTD, 5 Jun 95, Doc III-119, 1998 USAFACFS ACH; Memorandum for John Yager, TSM Cannon, subj: SME Review of LW155 Portion of 1998 Annual Command History, 18 Feb 99, Doc III-120, 1998 USAFACFS ACH.

appeared to have great potential."[151] The U.S. Army Operational Test and Evaluation Command shared the general's conclusion in a draft report of November 1998.[152]

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[151]Memorandum for Cdr, U.S. Army Forces Command, subj: Support for High Mobility Artillery Rocket System and Automated 155mm Howitzer Modernization for XVIII Airborne Corps, 9 Nov 98, Doc III-121, 1998 USAFACFS ACH.

[152]Report, subj: Assessment for the 155-mm. Automated Howitzer, RFPI ACTD, 18 Nov 98, pp. 1-1 - 2-1, Doc III-122, 1998 USAFACFS ACH; Interview, Dastrup with John Yager, 10 Feb 99; Fact Sheet, subj: 155-mm. Towed Artillery Digitization, Feb 99, Doc III-122A, 1998 USAFACFS ACH.

Subsequent to the Rapid Force Project Initiative, the XM777 went through several key hurdles in 1999. Through 1998 the Army had furnished ambiguous support for the XM777 because of funding limitations and competing requirements for a technologically advanced Future Direct Support Weapon System to replace the M119A1 105-mm. towed howitzer. Determining that the Future Direct Support Weapon System required additional technological work, the Commandant of the Field Artillery School, Major General Leo J. Baxter, rekindled Army interest in the XM777 in February 1999 after consulting with the Deputy Assistant Commandant-Futures in the school. Shortly afterwards, the United State government signed a memorandum of understanding with the United Kingdom and Italy for joint development of the XM777 because the latter were looking for a lighter 155-mm. towed howitzer. This agreement would permit sharing developmental costs and foster commonality among the three countries.[153]

**Future Direct Support Weapon System or Advanced Technology Light Artillery System**

In 1996 the Field Artillery began exploring earnestly the elimination of all 105-mm. howitzers currently used as direct support weapons for the light and special purpose forces for several reasons. First, the 105-mm. howitzer had only two types of munitions that enhanced weapon range and lethality. These munitions included the recently produced rocket assisted projectile, the M913, and the recently type-classified dual-purpose improved conventional munition (DPICM), the M915. The munitions, however, lacked sufficient killing power and required large expenditures of ammunition to achieve the desired effect upon targets. Second, the 105-mm. howitzer offered little opportunity to improve its overall combat effectiveness, extended little or no growth potential as a weapons platform for the future battlefield, and would not satisfy Army XXI requirements. Third, the 155-mm. howitzer fired a far broader family of munitions that had much greater effectiveness when compared to the 105-mm. howitzer shell. Fourth, technology had advanced to the point where it was feasible to produce a 155-mm. direct support weapon

[153] Interview, Dastrup with John Yager, TSM Cannon, 7 Mar 00, Doc III-91; Email msg with atch, subj: LW 155, 16 Mar 00, Doc III-92.

weighing little more than the current 105-mm. direct support weapon, the M119A1 howitzer.[154]

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[154] 1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), p. 81.

In order to acquire a lightweight 155-mm. howitzer for direct support missions in light or special purpose forces to replace 105-mm. howitzers, the Field Artillery School developed and staffed a mission need statement with industry and other government agencies at a Integrated Concept Team meeting. The U.S. Army Training and Doctrine Command (TRADOC) subsequently approved the mission need statement in November 1997 and forwarded it to the Department of the Army where it was assigned a Catalog of Approved Requirements Documents number. Funding was being addressed in the Program Objective Memorandum for Fiscal Year 2000-2005.[155]

The Field Artillery School explained that the expected light weight of the Advanced Technology Light Artillery System (ATLAS) 155-mm. howitzer would be achieved by employing two complementary recoil management means. Renamed the Future Direct Support Weapon System (FDSWS) early in 1999, the system would employ soft recoil or fire out of battery technique. In the soft recoil application the howitzer cannon tube would move forward to achieve forward velocity. As this was occurring, the weapon would be fired. The recoil energy generated by the departing projectile had to overcome the forward motion of the tube before the tube would begin its rearward motion. This technique, although it was not new, would dissipate up to fifty percent of the recoil force in just overcoming the forward movement of the tube. Also, the system was being considered for the integration of electrorheological fluid technology. Upon the application of an electrical charge, electrorheological fluids would change viscosity. The integration of electrorheological fluids would permit real time management (fine tuning) of the recoil force imparted to the cannon upon firing. Such management would occur in milliseconds because the application of electric charge to the fluid would change the viscosity instantaneously. These combined technologies would result in a weapon platform of five thousand pounds, which would be only eight hundred pounds heavier than the M119A1 howitzer.[156]

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[155] Ibid.; Msg, subj: ATLAS Input to Annual Command History, 17 Mar 99, Doc III-123, 1998 USAFACFS ACH.

[156] 1997 USAFACFS ACH, pp. 81-82; Msg, subj: ATLAS Input to Annual Command History, 17 Mar 99; Msg, subj: ATLAS

Input to Annual Command History-Reply, 17 Mar 99, Doc III-124, 1998 USAFACFS ACH.

Late in 1998 and early 1999, further developments shaped the FDSWS/ATLAS program. In the fall of 1998, the Commandant of the Field Artillery School, Major General Leo J. Baxter, explained, "ATLAS will provide the lethality, strategic deployability, and operational and tactical mobility needed to defeat future threats across the spectrum of conflict."[157] The howitzer's light weight would make it ideal for the light forces. Along this line General Baxter made a critical decision on 23 February 1999. He reaffirmed that the lightweight 155-mm. howitzer would replace the M198 towed 155-mm. howitzer and that FDSWS/ATLAS would be a direct support weapon for the light forces to replace the M119 towed 105-mm. howitzer. This effectively ended considering the FDSWS/ATLAS for a general support role. Equally important, the General deferred making a decision on the caliber size, pending a forthcoming analysis to determine the ideal caliber (105-mm. to 155-mm.), the range, and the other desired characteristics. This meant as of early 1999 that the caliber was undecided even though the mission was not.[158]

In the fall of 1999, the new Chief of Staff for the Army, General Eric K. Shinseki, delivered a speech to the Association of the United States Army in Washington D.C. that outlined his vision and concept to reorganize the Army and that significantly altered the FDSWS program. Essentially, the General desired to make the heavy forces lighter and more deployable and to make the light forces more lethal with greater staying power. His plan, dubbed the Medium Brigade Concept, called for the organization of two brigades at Fort

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[157] MG Leo J. Baxter, "ATLAS: Close Support for Future Light Forces," Field Artillery, Sep-Oct 98, p. 1, Doc III-125, 1998 USAFACFS ACH.

[158] Baxter, "ATLAS: Close Support for Future Forces," p. 2; Interview, Dastrup with Steve Johnson, Project Manager, DCD, 23 Feb 99, Doc III-126, 1998 USAFACFS ACH; Msg, subj: ATLAS Input to Annual Command History, 17 Mar 99.

Lewis, Washington, beginning in September 2000 as a step towards meeting the his vision.[159]

[159] Email msg with atch, 17 Mar 00, Doc III-93.

Although the initial brigades would be fielded with existing equipment, General Shinseki wanted a common platform to reduce the logistics, training, and maintenance burden on the units. Accordingly, TRADOC began the development of requirements documents for the interim brigade, now called the Interim Brigade Combat Team, to be fielded with current weapon technology but integrated on the common platform. The Directorate of Combat Developments in the U.S. Army Field Artillery School worked extensively in preparation of the operational requirements document for the Fire Support Team Variant and the Self-propelled Howitzer Variant of the Interim Brigade Combat Team Capstone Requirements Document. As the same time the Directorate worked with the Department of the Army to develop the funding profiles for the Program Objective Memorandum for Fiscal Years 2002-2007. The Army deleted the funding line for the FDSWS in the Program Objective Memorandum (POM) for Fiscal Years 2002-2007. The Chief of Staff used that money to help fund the Interim Brigade Combat Team and the objective Brigade Combat Team requirements. One of these was the Future Combat System that would be the objective chassis. According to plans in 1999, there would be a direct fire variant and an indirect fire variant to be mounted on the Future Combat System chassis and fielded around 2012.[160]

**Multiple-Launch Rocket System**

In 1998 and 1999 improvement efforts with the Multiple-Launch Rocket System (MLRS) focused on enhancing the munitions to give them better range and precision and making the launcher more responsive. Although MLRS performed well during Operation Desert Storm in 1991, its rockets and their submunitions raised serious concerns. During the war, many Iraqi artillery assets outranged their coalition counterparts, including MLRS. Also, the high dud rate of munitions, including MLRS submunitions, raised apprehensions about the safety of soldiers passing through impact areas. Together, the proliferation of rocket systems with greater ranges than MLRS and the unacceptable dud rate led to the requirement for an extended-range (ER) MLRS rocket with a range of forty-five

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[160]Email msg with atch, 17 Mar 00; Email msg with atch, 20 Mar 00, Doc III-94.

kilometers and a lower submunition dud rate. Such a range would increase the commander's ability to influence the battlefield at depth and to fire across boundaries and simultaneously would improve the survivability of launcher crews.[161]

[161] 1995 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), p. 126; Fact Sheet, subj: MLRS Rockets, 1998, Doc III-127, 1998 USAFACFS ACH. See Memorandum for Record, subj: MLRS, 2 Jun 99, Doc III-95, for a good history of MLRS.

Between 1995 and 1999 the Army moved ahead with developmental efforts on the ER-MLRS M26A2 rocket loaded with the M85 grenade with a self-destruct fuze. Although the self-destruct fuze was improved as indicated by tests in 1995 and although the required range for the rocket was met, tests in 1996 disclosed that the dud rate was still too high. This caused the Army to develop a "get well plan" in April 1996 to improve the self-destruct fuze and to conduct additional testing in 1997. After the M85 grenade had demonstrated a reduced dud rate that satisfied the requirement, the Army moved the rocket into low-rate initial production in 1997 with operational testing in Fiscal Year (FY) 1998. Although the ER-MLRS rocket successfully passed the operational tests in 1998, funding constraints and the decision to transition to a guided MLRS rocket with more accuracy limited production to less than five thousand rockets. Because equipment that could produce the ER-MLRS M26A1 rocket with M85 grenade at the desired quantities was unavailable, the Army started fielding the ER-MLRS M26A1 rocket loaded with the M77 dual purpose improved conventional munition (DPICM) with a standard fuze to U.S. Forces, Korea, in 1999 to meet their urgent need for extended-range capability. After the production equipment had been validated and could actually generate the needed quantities of M85 grenades, the remaining quantities of ER-MLRS rockets would be loaded with the M85 grenade to make the M26A1 rocket.[162]

[162]1996 USAFACFS ACH, p. 123; 1997 USAFACFS ACH, pp. 82-83; Fact Sheet, subj: ER-MLRS, Feb 99, Doc III-128, 1998 USAFACFS ACH; Fact Sheet, subj: MLRS Rockets, 1998; Interview with atch, Dastrup with MAJ Patrick J. Sutherland, TSM RAMS, 24 Feb 00, Doc III-96; Fact Sheet, subj: MLRS Rocket, Apr 99, Doc III-97; FY 99 Annual Report (Extract), Directorate of Testing and Evaluation, subj: ER-MLRS Rockets and GMLRS Rockets, Doc III-98; Interview, Dastrup with Jeff Froysland, TSM RAMS, 2 Mar 00, Doc III-99; Information Paper, subj: XM235 Self Destruct Fuze, 10 Feb 00, Doc III-

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As the Army worked to introduce the ER-MLRS M26A1 rocket, it decided to adopt an extended-range guided MLRS rocket that could be fired from the M270A1 MLRS Launcher and High Mobility Artillery Rocket System (HIMARS) Launcher. Writing in Army in September 1996, the Commandant of the Field Artillery School, Major General Randall L. Rigby, explained the reasoning behind the decision to introduce the guided MLRS rocket. In recent years the Army's ability to protect itself from long-distance attack had been eroded with the proliferation of long-range rocket and cannon systems. To counter this the U.S. Army Missile Command's Research, Development, and Engineering Center with support from industry initiated work on an extended-range guided rocket for the MLRS to replace ER-MLRS in the twenty-first century. Unlike the accuracy of the traditional free-flight MLRS rocket that degraded as the range to the target increased, the guided rocket's guidance system would provide consistent, improved accuracy from a minimum range of fifteen kilometers to a maximum of sixty to seventy kilometers, depending upon warhead weight and type of propellant, to attack area and point targets. This would give the MLRS an additional fifteen kilometer range beyond the ER-MLRS. Such a range would permit hitting more targets, would make the MLRS more survivable because it could be positioned farther from the target, would require fewer rockets to neutralize a target, would reduce logistical requirements, and would enhance the Army's ability to conduct precision strikes. Given the need for the rocket, the Army awarded a contract to Lockheed Martin Vought Systems in November 1998 for engineering and manufacturing development (EMD) with low-rate initial production to begin in 2002 based upon successful testing and with the first unit to be equipped in 2004. The guided MLRS rocket, moreover, would be complemented by the smart MLRS tactical rocket with a maximum range of sixty to seventy kilometers. The smart munition that would be effective against a wide variety of high-value targets to include counterfire, air defense sites, and maneuver elements. In 1999, however, the Department of the Army terminated the smart MLRS rocket to save money for developing and fielding the Initial Brigade Combat Team as part of the transformation of the Army effort to make the Army more strategically deployable.[163]

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[163] 1996 USAFACFS ACH, pp. 123-24; 1997 USAFACFS ACH, p. 83; Fact Sheet, subj: Guidance and Control for Guided MLRS Rocket, Feb 99, Doc III-129, 1998 USAFACFS ACH; Fact Sheet, subj: MLRS Rockets, 98; "International Partners Sign $121 million GMLRS Contract, MLRS Dispatch," Fourth Quarter 1998, p. 2, Doc III-130, 1998 USAFACFS ACH; Fact Sheet, subj: MLRS Rockets, 1998, Doc III-131, 1998 USAFACFS ACH; Fact Sheet, subj: MLRS Smart Tactical Rocket, 1998; "Guided MLRS Moving into EMD," MLRS Dispatch, Third Quarter 1998, p. 2,

Doc III-132, 1998 USAFACFS ACH; Annual Report, Program Executive Officer Tactical Missiles, 1998, pp. 18-19, Doc III-133, 1998 USAFACFS ACH; Email msg with atch, subj: Future of Heavy Systems, 6 Jan 00, Doc III-101; Interview, Dastrup with Jeff Froysland, TSM RAMS, 2 Mar 00; Fact Sheet, subj: MLRS Rockets, Apr 99; FY 99 Annual Report (Extract), Director of Operational Test and Evaluation, subj: MLRS ER- and Guided-MLRS Rockets; Email msg with atch, subj: MLRS, 13 Mar 00, Doc III-102.

As the Army was dropping one MLRS rocket program, it explored the possibility of adding another in 1999. Looking at Kosova in 1999 and the need to reduce damage to civilian property and lives, the Army required a more accurate MLRS rocket with a high-explosive, unitary warhead and investigated the possibility of acquiring the unitary rocket. It would be equipped with a fuze with the capabilities of a proximity fuze, a point-detonating fuze, or a time-delay fuze, depending upon the target. The proximity fuze capability would give a large burst over the target. The point-detonating fuze capability would reduce the size of the burst and collateral damage because of the ground burst, while the time-delay fuze capability would permit the rocket to penetrate certain types of structures or targets and then detonate the rocket. Besides the availability of three different fuze capabilities with each having advantages and disadvantages, the unitary rocket would be equipped with an anti-jam guidance system to improve accuracy beyond even the guided MLRS rocket.[164]

Meanwhile, two critical factors generated the drive to modernize the MLRS M270 launcher. Early in the 1990, the Army realized that the M270 was growing obsolete with electronic parts becoming more expensive and difficult to obtain by the twenty-first century. To combat the growing obsolescence, the Army initiated the Improved Fire Control System (IFCS) program in 1992 to replace obsolete electronic systems and to provide for growth potential for future munitions. Subsequently, the analysis of Operation Desert Storm of 1991 caused the Army to conclude that it needed a more responsive and survivable MLRS launcher to engage highly mobile targets. This led to the Improved Launcher Mechanical System (ILMS) program in 1995 to reduce reaction times by decreasing the time to aim and load the launcher.[165] For several years the Improved Fire Control System and Improved Launcher Mechanical System modifications were two separate program elements. As a result of the integrated test program initiative, the Army combined the two programs in 1997 to make one. Together, the two modernization efforts would produce the M270A1 launcher early in the twenty-

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[164]Interview, Dastrup with Froysland, 2 Mar 00; Email msg with atch, subj: MLRS Rockets, 6 Mar 00, Doc III-103; Email msg, subj: MLRS Rockets, 6 Mar 00, Doc III-104; Memorandum for Dir, TSM Rockets and Missiles, subj: Coordination of 1999 USAFACFS Annual Command History, 29 Mar 00, Doc III-104A.

[165]Interview with atch, Dastrup with MAJ Patrick J. Sutherland, TSM RAMS, 24 Feb 00; FY 99 Annual Report (Extract), Director of Operational Test and Evaluation, subj: MLRS M270A1 Launcher, Doc III-105.

first century.[166]

[166] 1997 USAFACFS ACH, p. 84; Fact Sheet, subj: MLRS Launcher Improvements, 1998, Doc III-136, 1998 USAFACFS ACH; "M270A1 Production to Begin," MLRS Dispatch, Third Quarter 1998, p. 5, Doc III-132, 1998 USAFACFS ACH; Report (Summary), Director of Operational Testing and Evaluation, subj: MLRS M270A1 Launcher, 12 Feb 99, Doc III-137, 1998 USAFACFS ACH; Interview with atch, Dastrup with MAJ Patrick J. Sutherland, TSM RAMS, 24 Feb 00; Email msg with atch, subj: MLRS, 13 Mar 00.

Developmental work on the M270A1 launcher progressed in 1998. Based upon successful testing of the Improved Fire Control System and Improved Launcher Mechanical System early in the year to demonstrate that deficiencies identified in 1997 testing had been fixed, the Program Executive Officer of Tactical Missiles, Brigadier General Willie Nance, approved moving into low-rate initial production of forty-five launchers on 28 May 1998 with a goal of conducting initial operational test and evaluation in September 1999 and fielding the launchers in the fourth quarter of FY 2000.[167]

In 1999 problems arose to halt testing. Data collected from training the test crews early in the year showed that the soldiers were having problems with the modem for digital communications and as a result had to reconfigure their communications more often than appeared necessary. This problem, the immaturity of the software, and the unavailability of Low-rate Initial Production (LRIP)-configured M270A1 launchers that were required for the initial operational test and evaluation prompted senior management officials in July 1999 to postpone the test until May 2001. The delay would permit further maturation of the software and

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[167]Interview, Dastrup with CPT Richard P. Howard, TSM RAMS, 9 Feb 99, Doc III-138, 1998 USAFACFS ACH; Memorandum for Director, DCD, subj: Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99, p. 234, Doc III-138A, 1998 USAFACFS ACH; Fact Sheet, subj: MLRS Launcher Improvements, 1998; "M270A1 Production to Begin," MLRS Dispatch, Third Quarter 1998, p. 5; Report (Summary), Director of Operational Testing and Evaluation, subj: MLRS M270A1 Launcher, 12 Feb 99.

would allow using Low-rate Initial Production M270A1 launchers as planned rather than engineering and manufacturing development launchers that did not have the enhanced processors that could run the VX Works operating software that was planned for fielding.[168]

[168]Interview with atch, Dastrup with Sutherland, 24 Feb 00; FY 99 Annual Report (Extract), Directorate of Test and Evaluation, subj: MLRS M270A1 Launcher; "IOTE for New Multiple-Launch Rocket System to Slip 18 Months," Inside the Army, 22 Nov 99, pp. 1, 11, Doc III-106; Email msg with atch, subj: MLRS, 13 Mar 00.

Just as the low-rate initial production M270A1 launcher was coming out, the Army generated new system requirements as part of the drive for better situational awareness, which was the ability to know where everyone was on the battlefield. The growing concern with situational awareness forced M270A1 hardware to be replaced in the near future so that the MLRS launcher would part of the tactical Internet, which was a system of computers, radios, and other communications equipment to simply communications.[169]

Meanwhile, the decision of the Chief of Staff of the Army, General Eric R. Shinseki, caused the Army to revise the number of M270A1 launchers to be purchased. Initially, the Army had planned to buy 857 launchers. With the emphasis shifting to medium forces, the Army cut the planned number to 412 in 1999. These would go to the counterattack forces of the III Armored Corps.[170]

In the meantime, rapidly changing technology made the

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[169] Interview with atch, Dastrup with Sutherland, 24 Feb 00; FY 99 Annual Report (Extract), Director of Operational Test and Evaluation, subj: MLRS M270A1 Launcher. See Rupert Pengelley's "Battling with Tactical Internets," Jane's International Defense Review, Feb 00, pp. 44-50, Doc III-28, for additional discussion on tactical Internets.

[170] Interview with atch, Dastrup with Sutherland, 24 Feb 00; Memorandum for Dir, TSM Rockets and Missiles, subj: Coordination of 1999 USAFACFS Annual Command History, 29 Mar 00.

launcher's 486 computer obsolete and caused the Army to decide to replace it with a Power PC processor and the VX Works operating system for the initial operational test and evaluation and the first unit equipped. As explained to acquisition officials in 1998 and 1999, the new computer would provide numerous advantages. It would increase the processing capabilities significantly, would expand random access memory (RAM) capacity from eight megabytes to thirty-two megabytes, would provide a sixty-four bit rather than a thirty-two bit processor, and would provide a cost reduction of $33,000 per launcher. Meanwhile, the VX Works operating system would provide state-of-the-art capabilities.[171]

[171]Interview with atch, Dastrup with Sutherland, 24 Feb 00; FY 99 Annual Report (Extract), Director of Operational Test and Evaluation, subj: MLRS M270A1 Launcher; Email msg with atch, subj: MLRS, 13 Mar 00; Memorandum for Dir, TSM Rockets and Missiles, subj: Coordination of 1999 USAFACFS Annual Command History, 29 Mar 00.

Even before serious developmental work on the M270A1 could start, a critical need arose that led to a parallel development effort with the M270 launcher. In 1993 the Army determined that the ATACMS Block IA would receive its Global Positioning System (GPS) initialization data directly from the launcher. Although the M270A1 launcher would have that capability, the Block IA missile would be introduced in 1998 before the launcher would be fielded. In view of this, the Army decided to upgrade the M270 launcher by incorporating GPS navigation to create the Improved Positioning Determining System (IPDS) launcher that it could fire the ATACMS Block IA. As of 1998, funding existed to field twenty-nine IPDS launchers beginning in 1998 and continuing into 2003 when they would be retrofitted to M270A1 configuration. Ten IPDS launchers went to the C Battery, 6-37th Field Artillery in Korea, which received new equipment training in February 1998, and nineteen went to the 2-18th Field Artillery at Fort Sill, Oklahoma, which underwent new equipment training in March-May 1998.[172]

## High Mobility Artillery Rocket System

Although the Army first envisioned the need for a light multiple rocket launcher system in the 1980s as it started to field more light divisions, efforts to introduce it increased in urgency in the 1990s. In a message in mid-September 1990, the Commanding General of the U.S. Army Training and Doctrine Command (TRADOC) wrote, "TRADOC support for the HIMARS [High Mobility Artillery Rocket System] program has not waned. Indeed recent world events [the crisis in the Persian Gulf] serve to highlight the need for such a capability. The HIMARS

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[172]1997 USAFACFS ACH, pp. 83-84; "2-18th Certified on MLRS IPDS Use," MLRS Dispatch, Second Quarter 1998, p. 4, Doc III-134, 1998 USAFACFS ACH; Fact Sheet, subj: Improved Positioning Determining System Launcher, 1998, Doc III-135, 1998 USAFACFS ACH.

program will continue to receive full TRADOC support. . . ."[173]

[173] 1995 U.S. Army Field Artillery Center and Force Sill (USAFACFS) Annual Command History (ACH), pp. 132-33. See 1994 USAFACFS, pp. 163-86 for an in-depth discussion of the development of HIMARS.

Although HIMARS was well-received throughout the Army with a few exceptions and showed promise, budgetary problems stalled development. In 1991 the Army did not fund HIMARS in its Long-Range Research, Development, and Acquisition Plan because the payoff of fielding two battalions was not deemed worth the cost of a new start. The Operational Requirements Document (ORD) stated only a requirement for two battalions with three being desired, whereas Legal Mix VII, being conducted by the U.S. Army Field Artillery School, supported a requirement of four to six battalions based on the Army's need to respond to two major regional contingencies in rapid sequence. Notwithstanding the requirement for increased "capability and lethality of. . . early deploying forces," HIMARS lost funding in the Army's program objective memorandum in March 1992 because the small amount of funding marked the program as being unable to be executed by budget managers in Headquarters, Department of the Army.[174]

As a part of the effort to obtain HIMARS, in the meantime, the Field Artillery School began working as early as the spring of 1992 to find funding to construct one or two prototypes. Prototypes would permit commanders and other Army officials to observe the system's capabilities firsthand and to erase any doubts about the necessity of funding it. Perceiving that the Department of Defense's Science and Technology Initiative (Thrust) Number Five, Advanced Land Combat, could be an avenue to begin HIMARS development and gain momentum with the program, the School looked to that source. However, Dr. Fenner Milton, the chairperson of Thrust Number Five, only authorized money ($4.2 million) in December 1992 for Fiscal Years (FY) 1994-1996 to develop technology that could feed into HIMARS because of its potential to provide a substantial warfighting capability to early deploying light forces. Notwithstanding this, the HIMARS program still lacked funding for prototype development because Dr. Milton only provided money for developing the technology that might be used in HIMARS and not for developing prototypes.[175]

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[174] Ibid., pp. 133-34.

[175] Ibid.

The Field Artillery School's struggle to field HIMARS continued into the next year. On 24 February 1993 the Office of the Assistant Secretary of the Army for Research and Development wrote that Dr. Milton had expressed interest in working with the Field Artillery School. He wanted to reach an overall research and development strategy that supported HIMARS, that was affordable, and that could be justified.[176] In a subsequent telephone conversation with the Director of the Directorate of Combat Developments (DCD), U.S. Army Field Artillery School, on 5 March 1993, Dr. Milton reemphasized his support for HIMARS. With this, funding from Thrust 5 seemed possible for HIMARS prototypes, but it never came.[177]

Meanwhile, the School pursued action with the U.S. Army Tank and Automotive Command, the U.S. Army Missile Command, the Program Manager of Multiple-Launch Rocket System (MLRS) and others to build a mockup HIMARS. This would permit collecting user input, maintaining visibility at high-profile events, and demonstrating the feasibility of the design. Equally important, the mockup could eventually lead to funding for prototypes.[178] Although funding for HIMARS remained critical during 1993, the mockup, which could be carried by a C-130 but could not fire, could elevate and traverse to fixed positions, and had a two-person crew, produced the desired results. At the Association of the United States Army convention in October 1993, the Chief of Staff of the Army, General Gordon R. Sullivan, expressed an interest in the mockup. Based upon successful mockup demonstrations, the Undersecretary of Defense and other Department of Defense agencies also expressed an interest in developing HIMARS prototypes. Even though high-level support existed, even though the Depth and Simultaneous and Attack Battle Laboratory at the Field Artillery School and the Joint Precision Strike Demonstration Task Force were working to obtain funds, and even though a test firing in December 1993 was successful, HIMARS still remained unfunded at the close of 1993.[179]

Although funding did not materialize in 1994, support for HIMARS continued to grow. In January 1994 the Field Artillery School shipped the HIMARS mockup to Fort Polk, Louisiana, for the light commander conference. Army commanders there "loved" HIMARS as did the Marines, who desired to display it at Twenty Nine Palms, California. As many in the Field Artillery School anticipated, the Marine Corps enthusiastically endorsed

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[176]Ibid., pp. 134-35.

[177]Ibid., p. 135.

[178]Ibid.

[179]Ibid., pp. 135-36.

HIMARS. In fact, School participants at the March 1994 demonstration for the Marine Corps reported, "They [Marine Corps] were all impressed with the HIMARS."[180] Eight months later, the Army Chief of Staff expressed his support.[181]

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[180]Ibid., p. 136.

[181]Ibid., pp. 136-37.

Although the support failed to produce any funding at the end of 1994, Program Manager, Multiple-Launch Rocket System and the Rapid Force Projection Initiative (RFPI), a joint effort sponsored by U.S. Army Missile Command (MICOM) and Dismounted Battle Space Battle Laboratory, Fort Benning, Georgia, signed a memorandum of agreement early in 1995 to build four HIMARS prototypes with RFPI putting $33 million towards rapid design, fielding, and experimentation in 1998. The RFPI, a multi-year effort, planned to conduct an Advanced Concepts Technology Demonstration (ACTD) in 1998 using new target acquisition systems, "shooters," and command and control systems with the intent of moving mature technological solutions into significant operational capabilities to fill the gap created by the aging forward-based equipment and the power projection strategy of forced or early entry operations. Through the ACTD the RFPI ultimately wanted to address the vulnerabilities of early entry forces during the initial days of a deployment and before the entrance of follow-on forces into the area of operations by increasing their lethality, survivability, and ability to control battle tempo. One of the new systems would be the four HIMARS prototypes. After the ACTD of the summer of 1998, the RFPI intended to leave three of the four HIMAR prototypes behind for the XVIII Airborne Corps to use and evaluate for approximately two years.[182]

[182] 1997 USAFACFS ACH, pp. 91-92; Fact Sheet, subj: RFPI ACTD, Apr 98, Doc III-145, 1998 USAFACFS ACH.

In 1996 the HIMARS experienced mixed progress. Even though the Field Artillery School reaffirmed the requirement for HIMARS, the Army in July 1996 removed funding for the first two years of engineering and manufacturing development (EMD) from the Fiscal Year (FY) 1998 Program Objective Memorandum. As the U.S. Army Training and Doctrine (TRADOC) System Manager, Rockets and Missiles in the Field Artillery School explained, this produced a disconnect. Funded when the Army and the contractor signed a contract in February 1996, the four RPFI ACTD prototypes would be fielded late in 1998. User testing by the XVIII Airborne Corps would be completed about 2000. Without funding for engineering and manufacturing development of HIMARS, the Army slipped the start of development of the objective system to FY 2004 and the first unit equipped date to FY 2009. The lack of EMD funding, therefore, created a gap of several years between the end of user testing with the prototypes in FY 2000 and the first unit equipped date. As a result, the Field Artillery School feared the inability of incorporating lessons learned from the prototype testing into the development of the objective HIMARS system. Funding had to be restored to eliminate the gap and to minimize losing the lessons learned and contractors with development experience.[183]

Fortunately, the Army partially resolved the funding issue in 1997 and 1998. With the availability of some funds, the Army decided to initiate a maturation phase in 2001 and to introduce modifications to HIMARS based upon the extended user evaluation, to begin engineering and manufacturing development in 2000, to start procurement in 2004, and to launch fielding in 2005. Because the system would add considerable fire support capability to early deploying light forces and because emerging force structure studies called for each of the two field artillery brigades in support of the light division to consist of two HIMARS battalions and one towed artillery battalion, the Army funded HIMARS in the POM.[184]

In 1999 the Army approved an accelerated program for two battalions beginning in FY 2005. The Program Executive Office for Tactical Missiles authorized moving the program into a thirty-six month maturation phase in 2000. Any modifications

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[183]1996 USAFACFS ACH, pp. 139-40; 1997 USAFACFS ACH, p. 92.

[184]1997 USAFACFS ACH, p. 92; CPT Jason W. Robbins, "HIMARS for Deployable 'Heavyweight' Fires," Field Artillery, May-Jun p. 33, Doc III-146, 1998 USAFACFS ACH; Fact Sheet, subj: MLRS Launcher Improvements, Apr 98, Doc III-147, 1998 USAFACFS ACH; Msg, subj: HIMARS, 14 Feb 99, Doc III-148, 1998 USAFACFS ACH; Msg, subj: HIMARS History, 12 Feb 99, Doc III-149, 1998 USAFACFS ACH.

necessary based upon the extended user evaluation would take place during the maturation phase and would lead to developmental testing in FY 2001, the start of operational testing in FY 2004, and equipping the first unit in 2005.[185]

[185]Memorandum for Dir, TSM Rockets and Missiles, subj: Coordination of 1999 USAFACFS Annual Command History, 29 Mar 00, Doc III-III-104A.

Based upon HIMARS's successful showing in the RFPI ACTD of mid-1998, the Army, in the meantime, determined to retain the system. The Army left three of the four HIMARS prototypes behind for the XVIII Airborne Corps to form a platoon of three HIMARS in the 3-27th Field Artillery to use for approximately two years beginning in October 1998 and in 1999 considered leaving HIMARS with the XVIII Airborne Corps beyond the end of the extended user evaluation period that would end in September 2000. The fourth prototype remained with the contractor for continued development.[186]

Testing in 1998, which included firing an Army Tactical Missile System Block IA missile, went well to push HIMARS further along the developmental process in 1999. That year, the Program Manager for HIMARS received permission to move into the maturation phase and to incorporate design changes based upon the ACTD and XVIII Airborne Corps use.[187] In fact,

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[186]"HIMARS Fires First Rockets," MLRS Dispatch, Second Quarter 1998, p. 2, Doc III-134, 1998 USAFACFS ACH; Robbins, "HIMARS for Deployable "Heavyweight" Fires," p. 33; Msg, subj: HIMARS, 14 Feb 99; Memorandum for Dir, TSM Rockets and Missiles, subj: Coordination of 1999 USAFACFS Annual Command History, 29 Mar 00.

[187]MG Leo J. Baxter, "Force Modernization: It isn't Just for Heavy Forces Anymore," Field Artillery, Jan-Feb 99, p. 1, Doc III-107; Interview with atchs, Dastrup with MAJ Lawrence J. Abrams, TSM RAMS, 24 Feb 00, Doc III-108.

the Commanding General of XVIII Airborne Corps, Lieutenant General William F. Kernan, commented in an interview about the importance of the missile system. He noted, "HIMARS is paramount to our success and survivability."[188] Lieutenant Colonel Donald E. Gentry and Major Cullen G. Barbato of the 3-27th Field Artillery, who participated in the ACTD as part of the XVIII Airborne Corps wrote, "HIMARS is a significant leap forward in fire support for early entry and light forces. Light force commanders who must deploy to undeveloped areas soon will have the firepower normally associated with heavier forces."[189]

**Army Tactical Missile System and Brilliant Antiarmor Submunition**

[188]Interview, Patrecia S. Hollis, editor of Field Artillery with LTG William F. Kernan in Field Artillery, Jan-Feb 99, p. 3, Doc III-109.

[189]Gentry and Barbato, "HIMARS: Firepower for Early Entry Forces," Field Artillery, Jan-Feb 99, p. 19, Doc III-110.

After several years of full-scale engineering and development in the 1980s, the Army introduced the Army Tactical Missile System (ATACMS) early in the 1990s to meet the pressing requirement for attacking second-echelon forces. Mounted on a Multiple-Launch Rocket System (MLRS) M270 launcher, ATACMS was designed to engage "soft" stationary targets (air defense units; command, control, and communications; surface-to-surface missile units; logistical sites; and helicopter forward operating bases) at ranges of 25 to 165 kilometers by dispensing bomblets over the target. Because of Operation Desert Shield of 1990, the Army shifted the fielding the first ATACMS from Germany to Saudia Arabia when it fielded the first missile system in August 1990. As combat operations in Operation Desert Storm by A Battery, 6-27th Field Artillery, 75th Field Artillery Brigade demonstrated, ATACMS, later renamed ATACMS Block I as new versions were introduced, gave the Army its first real deep attack capabilities with a conventional weapon to support AirLand Battle. Ultimately, Lockheed Martin Vought Systems of Grand Prairie, Texas, produced approximately fifteen hundred missiles by Fiscal Year (FY) 1997 to complete fielding.[190]

Operational considerations in 1991-92, in the meantime, raised the necessity of an extended-range ATACMS. Concerned about deficiencies in theater missile defense, the U.S. Army Strategic Defense Command tasked the U.S. Army Field Artillery School (USAFAS) to find solutions. In its Artillery Attack Operations Study, approved by the Commandant of the Field Artillery School, Major General Fred F. Marty, in February 1993, the School determined that an extended range would improve ATACMS's operational capabilities by allowing it to engage more targets at a deeper range.[191]

This conclusion dovetailed nicely with observations of many Army officers. Based upon their experiences in Operation Desert Storm in 1991, commanders, their staffs, and users also visualized the need for greater range for ATACMS. Some insisted that the existing range was inadequate and restricted the number of targets that could be engaged. With engineering changes the system could achieve twice or more the range of the current ATACMS Block I to give commanders more flexibility to attack deep targets, such as long-range, surface-to-surface missile launchers, and air defense sites, to compensate for

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[190]1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 84-85; Interview, Dastrup with MAJ Jay Hilliard, TSM RAMS, DCD, 5 Feb 99, Doc III-139, 1998 USAFACFS ACH. See Memorandum for Record, subj: ATACMS, 2 Jun 99, Doc III-111, for a short history on ATACMS.

[191]1995 USAFACFS ACH, p. 130.

availability shortfalls of tactical air because of priorities, weather, and darkness, and to attack targets more quickly than tactical air could.[192]

[192]Ibid., pp. 130-31; Memorandum for Dir, TSM Rockets and Missiles, subj: Coordination of 1999 USAFACFS Annual Command History, 29 Mar 00, Doc III-104A.

Over the next several years, the Field Artillery School worked to introduce the Extended-Range ATACMS, renamed Improved ATACMS and finally ATACMS Block IA in 1994. During 1993, the School developed the requirements and documentation for the Army System Acquisition Review Council (ASARC) of February 1994 that would decide if the system could go into engineering and manufacturing development. Co-chaired by the Army Vice Chief of Staff and Military Deputy to the Assistant Secretary of the Army for Research, Development, and Acquisition, the ASARC reviewed the plans to extend ATACMS's range by reducing the payload and to incorporate the Global Positioning System (GPS) navigational system. The council approved the plans in February 1994 and directed the program to proceed with engineering and development of the enhancements. When completely fielded, the ATACMS Block IA would have a range of 70 to 300 kilometers and would carry approximately 300 anti-personnel, anti-material M74 bomblets to neutralize soft targets rather than the 950 carried in the ATACMS Block I. Increased accuracy of the ATACMS Block IA, produced by the GPS navigational system, would offset the reduction in number of bomblets and produce a greater range than ATACMS Block I.[193]

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[193]1995 USAFACFS ACH, p. 130; Fact Sheet, subj: ATACMS, 1998, Doc III-140, 1998 USAFACFS ACH; Interview, Dastrup with Hilliard, 5 Feb 99; Report (Summary), Director of

Operational Testing and Evaluation, subj: ATACMS Block IA, 12 Feb 99, Doc III-141, 1998 USAFACFS ACH; Fact Sheet, subj: ATACMS, Apr 99, Doc III-112; Interview with atchs, Dastrup with MAJ Jay Stephens, TSM RAMS, 24 Feb 00, Doc III-113; Memorandum for Dir, TSM Rockets and Missiles, subj: Coordination of 1999 USAFACFS Annual Command History, 29 Mar 00, Doc III-104A.

Development continued in 1996-1997. In 1996 the Army conducted test firings of ATACMS Block IA at White Sands Missile Range, New Mexico. Test firings from III Corps Artillery crews demonstrated the system's ability to accept digital fire missions from a Joint Surveillance and Target Attack Radar System (JSTARS) and Ground Station Module (GSM). Although all of the testing was not completed, the initial successful firings prompted the Program Executive Officer, Tactical Missiles on 21 May 1996 to approve a low-rate initial production to begin in September 1996. However, reliability concerns brought up early in 1997 caused the Gilbert F. Decker, the Army Acquisition Executive, to retain the system in low-rate initial production in 1997 to permit the Army to address effectiveness and reliability issues. Subsequent testing in 1997 justified a full-scale production decision by the Army in February 1998 with production to run about four years and the first fielding beginning in 1998. Funding levels as of 1998 would introduce 652 ATACMS Block IA missiles over the life of the production contract.[194]

In the meantime, difficulties with another missile led to significant modifications in the ATACMS program. In 1984 the Army started development on a brilliant antiarmor submunition (BAT) as part of a larger combat development program, the Tri-Service Standoff Attack Missile (TSSAM). TSSAM was a joint program to develop a stand-off cruise missile that would employ stealth technology to enhance survivability with the Army version being launched from the Multiple-Launch Rocket System (MLRS) launcher. Meanwhile, BAT was designed to employ acoustic and infrared seekers to acquire, classify, and destroy moving armored combat vehicles deep within enemy

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[194]1997 USAFACFS ACH, pp. 85-86; Interview, Dastrup with Hilliard, 5 Feb 99; Fact Sheet, subj: ATACMS, 1998; Fact Sheet, subj: ATACMS, 1999, Doc III-142, 1998 USAFACFS ACH; Memorandum for Record, subj: Annual History Input from MAJ Jay Hilliard, TSM RAMS, 24 Feb 99, Doc III-143, 1998 USAFACFS ACH.

territory (one hundred kilometers or more). BAT would have allocation logic to minimize the possibility of multiple BATs engaging a single vehicle and a large acquisition footprint to locate targets within four kilometers of the dispense point. Equally important, the Army designated TSSAM as the primary system to deliver BAT with ATACMS Block II being the secondary choice if TSSAM development should slip any more or be cut because of budget reductions.[195]

[195] Report (Summary), Director of Operational Testing and Evaluation, subj: ATACMS Block II/BAT, 12 Feb 99, Doc III-144, 1998 USAFACFS ACH; 1995 USAFACFS ACH, pp. 108-09.

Although ATACMS could carry BAT, the Army preferred TSSAM. The latter depended upon stealth technology to evade detection and had the ability of delivering more BAT submunitions than ATACMS Block II could (twenty-two versus thirteen). Because ATACMS Block II would fly almost three times faster than TSSAM, it gave the target less time to move after the missile had been fired and to evade being hit. Although the cost-per-kill with both, TSSAM and ATACMS Block II, was almost equal, integrating BAT with ATACMS Block II would be difficult. To dispense more BAT submunitions, ATACMS Block II would require a much blunter nose, which would make it less aerodynamic. Also, experts had to solve the problem of dispensing submunitions from ATACMS Block II over the target because the missile would be traveling at supersonic speeds when it released its submunitions. Regardless of the carrier missile, BAT would enable the Army to attrit enemy armored combat vehicles at great depth and "meter the flow" to make the close battle more manageable.[196]

In November 1993 the option of using TSSAM as a BAT carrier lost its attractiveness, forcing changes in priorities. Because of test failures and the increasing cost of the missile, the Army obtained permission from the Office of the Secretary of Defense to pull out of the TSSAM developmental effort. This left ATACMS Block II as the carrier missile and meant, at least for the time being, that the Army had to find a way to dispense BAT from a fast-moving missile. Interestingly, the decision to pull out of the TSSAM program had a negative impact. By coming so late in 1993, the decision prevented the Army from funding ATACMS Block II as a carrier for BAT in Fiscal Year (FY) 1994. As a result, fielding BAT was set back three years from 1998 to 2001.[197]

In the meantime, at the request of Congress in 1992, the General Accounting Office gathered information on the BAT program. Specifically, it examined the reasonableness of BAT cost estimates, the Cost and Operational Effectiveness Analysis's support for BAT development, and the Army's plans to demonstrate operational effectiveness prior to low-rate initial production approval. Besides pointing out that costs were escalating, the General Accounting Office indicated in a

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[196]Ibid., p. 109.

[197]Ibid., p. 109-10.

draft report of late 1993 that there was no way to conduct a full BAT operational test because of safety and other constraints. Because the Army received the draft report in January 1994, nothing had been done in 1993 to address the above concerns.[198]

[198]Ibid., pp. 110-11; 1997 USAFACFS ACH, pp. 87-88.

In 1994 a controversy between the Directorate of Operational Tests and Evaluation, a Department of Defense agency, and the Army arose over the operational tests of BAT. Picking up where the General Accounting Office left off, the Directorate of Operational Tests and Evaluation wanted the Army to fire two fully operational ATACMS Block II missiles with BAT warheads (twenty-six submunitions) to determine if they worked properly. In contrast, the Army wanted to fire only the number of warheads required to prove that BAT worked because it did not have sufficient numbers of threat vehicles to justify using two BAT warheads.[199]

Held in 1994, design verification tests significantly reduced the concerns with BAT. In the initial test the Army dropped two BATs from an airborne aircraft to validate hardware design. Both hit their respective targets. Minor problems, however, in a subsequent test in 1995 caused BAT to fail and miss the target. This influenced the Army to delay testing while additional engineering changes were made. BAT drop testing from aircraft resumed in 1996 and produced several successful engagements. On 16 October 1997 a flight test occurred in which BAT submunitions were successfully dispensed from the carrier for the first time. Based upon this and other successful flight tests, the ASARC of December 1998 decided to go into low-rate initial production with ATACMS Block II BAT and prepared for the Defense Acquisition Board of February 1999 because the Department of Defense had oversight responsibilities for the missile. Successful testing in 1999 led to awarding a low-rate initial production contract in the fall of 1999 with operational testing in 2000 and initial operational capability in 2001.[200]

Although the original justification -- the Soviet and Warsaw Pact threat -- had disappeared with the end of the Cold War, the requirement for BAT still existed. In 1994 the Army explained, "The greatest potential threat to US Forces is that posed by armored and motorized forces. These highly mobile armored maneuver forces, supported by armed helicopters, are expected to pursue battlefield objectives using numerical force superiority, speed, and penetration."[201] The Army also noted that it had an inadequate capability to attack armored vehicles and surface-to-surface missile launchers beyond the

[199]1995 USAFACFS ACH, p. 111.

[200]1997 USAFACFS ACH, p. 88; Interview, Dastrup with Hilliard, 5 Feb 99; Memorandum for Record, subj: Annual History Input from MAJ Jay Hilliard, TSM RAMS, 24 Feb 99; Interview with atchs, Dastrup with MAJ Jay D. Stephens, TSM RAMS, 24 Feb 00.

[201]1995 USAFACFS ACH, p. 112.

range of close combat weapons. In addition, the Army had the urgent need for an autonomous, terminal homing submunition to defeat moving and stationary targets in the second echelon of the threat array.[202]

[202] Ibid.

In view of the requirement to attack stationary armored vehicles and surface-to-surface missile (SSM) transporters, erectors, and launchers (TELS), the Army visualized the need for improving the BAT. The BAT Pre-Planned Product Improvement (P3I) would have the capabilities of attacking moving armor, stationary armor, hot or cold armor, SSM TELS, and heavy multiple rocket launchers and would be more capable in bad weather and against countermeasures. Carrying six BAT submunitions rather than thirteen as the ATACMS II would, ATACMS Block IIA would have a range of one hundred to three hundred kilometers and would use a global positioning system (GPS) augmented guidance system that was similar to the one in the ATACMS IA and ATACMS II to improve accuracy. As planned in 1997 and 1998, the BAT P3I would also be fielded in the remaining ATACMS Block II missiles starting in FY 2005 rather than BAT. ATACMS Block IIA with BAT P3I would also have an initial operational capability of FY 2007.[203]

In 1999 the Chief of Staff of the Army, General Eric K. Shinseki, revamped the Army's priorities when he announced his attention to field a medium-weight brigade combat team in the

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[203] 1997 USAFACFS ACH, p. 89; Fact Sheet, subj: ATACMS, Feb 99; Fact Sheet, subj: ATACMS, 1998; Interview, Dastrup with Hilliard, 5 Feb 99; Memorandum for Record, subj: Annual History Input from MAJ Jay Hilliard, TSM RAMS, 24 Feb 99; Email msg with atch, subj: ATACMS, 6 Mar 00, Doc III-114.

near future. To find money for the brigade, the Army terminated ATACMS Block IIA along with other programs in 1999. Rather than letting the ability to attack MRLs and TELs disappear, the Army chose to integrate that capability into the ATACMS Block II P3I BAT.[204]

**Firefinder Radars**

[204]Interview with atch, Dastrup with Stephens, 24 Feb 00; Email msg with atch, subj: ATACMS, 6 Mar 00.

Because of the growing threat of counterfire from hostile fire support systems, the Army initiated action in 1984 to improve its AN/TPQ-36 and AN/TPQ-37 radars. The Army considered these radars to be too large and heavy for AirLand Battle and for use with the light forces that were being developed. Through product improvements the Army planned to field a mobile, survivable Firefinder radar to replace the Q-36 and Q-37 radars in the target acquisition battery. To do this, the Army created a block improvement program in 1985-1986 to integrate existing Firefinder radars into a single follow-on system that would be based on the Q-36. Ongoing improvements to the Q-36 became Block I. Block II outlined incorporating crew reduction and self-leveling of the Q-36 radar and placing it on a five-ton truck, while Block III would add electronic improvements to the Q-36 radar late in the 1990s. Fielded on either a five-ton truck or track vehicle for the heavy division or a High Mobility Multipurpose Wheeled Vehicle (HMMWV) for the light forces, the Q-36 Block III radar would provide highly mobile and light target acquisition support. Because of the radar's configuration, the crew could rapidly occupy positions, detect targets up to thirty-six kilometers in range, and then quickly displace for better survivability.[205]

In 1987 the U.S. Army Field Artillery School split the Q-36 Block II program into Block IIA and Block IIB. With Block IIA the School outlined reducing the size of the Q-36 to fit on a five-ton truck to permit the crew to emplace the radar in fourteen minutes and displace it in five minutes and provide target acquisition for heavy divisions. In comparison, Q-36 Block IIB improvements focused on placing the radar on a trailer and towing it with a HMMWV to support the light forces. Block IIB would also reduce the number of vehicles required to transport the system and enhance strategic deployability.[206]

In view of the Army's shift from forward-deployed forces in Europe to power projection from the continental United States after the Cold War ended, the Commandant of the Field Artillery School, Major General Raphael J. Hallada (1987-1991), eliminated the Q-36 Block IIA early in the 1990s and placed priority and all funding into Block IIB. The Army then divided Block IIB into two phases or versions that would improve the survivability, mobility, and capability of the Q-36. In phase one (Q-36 version 7/HMMWV) the operations control group would be mounted on an M1097 HMMWV that would

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[205]1996 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Historical Review (AHR), p. 90.

[206]1995 USAFACFS Annual Command History (ACH), pp. 138-39.

tow the M116A2 cargo trailer. The second M1097 HMMWV would carry an MEP 112A generator and tow the Antenna Transceiver Group that would be mounted on a modified M116A2 trailer. The M998 HMMWV reconnaissance vehicle would pull a second M116A2 trailer that would have an additional MEP112A generator. This would improve the radar's transportability and mobility and produce a radar that could support both light and heavy forces.[207]

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[207] Ibid., p. 139.

Subsequent to these improvements, the Army planned to upgrade the Q-36 through electronics enhancements in phase two (Q-36 version 8). Besides being the first major pre-planned product improvement to the radar to prevent system obsolescence and decrease maintenance requirements, the electronics upgrade would eliminate the S-250 shelter and provide a flat panel display/control unit mounted in a Lightweight Multi-Purpose Shelter. The upgrade would also incorporate a new high-speed signal processor to furnish faster access to data (fifty to one hundred targets per minute), would increase memory and digital map storage, and would reduce maintenance and shelter space requirements. Additionally, the upgrade would increase detection ranges for mortars and field artillery from twelve kilometers to eighteen kilometers, allow remote operations up to one hundred meters from the shelter, provide weapon type identification, reduce the incidence of false targets, and enhance the probability of location.[208]

Work on the Q-36 version seven and Q-36 version eight produced viable results by 1994. Each active division artillery would receive three radars, while each active separate maneuver brigade would get one. Initial fieldings of the Q-36 version seven radar began late in 1993 and were completed in July 1994. Because of delays in contract awards for long-lead items, however, the Army fielded the radars without the Modular Azimuth Positioning System (MAPS). This required retrofitting these Q-36s with MAPS between August 1994 and July 1995. This action completed the fielding of the Q-36 version seven. Meanwhile, low-rate initial production for Q-36 version eight radars started in December 1993 with a successful initial operational test and evaluation (IOTE) of February 1996. In response, the Army awarded a production contract for the electronic upgrade to Northrup-Grumman on 19 August 1996 for eleven Q-36 version eight systems for delivery

[208]Ibid., pp. 139-40.

in 1998.[209]

[209]1996 USAFACFS ACH, pp. 143-44; 1997 USAFACFS ACH, p. 94; Memorandum for Record, subj: SME Comments on Firefinder Radars, 24 Feb 99, Doc III-149A, 1998 USAFACFS ACH.

In 1998 the Q-36 version eight system ran into problems that stalled fielding. Although the Program Manager for Firefinder and the Director of the Directorate of Combat Developments in the Field Artillery School understood that the radar had difficulties detecting volley fire, they agreed on 14 July 1998 to a conditional release pending the correction of the shortfall by the contractor as quickly as possible. At the same time they agreed to waive the false location requirement of one per six hours to one per three hours to provide some relief to the contractor. Subsequently, the Army fielded a total of six radars to three units during the last three months of 1998. Initial reports from the units, however, confirmed an excessive false location rate that exceeded the one per three hours and frequent system lock-up problems that hampered operations, even though detecting volley fire had improved.[210] Yet, the improved ability to

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[210]Interview, Dastrup with Ron Anderson, FF Program Manager, DCD, USAFAS, 17 Feb 99, Doc III-150, 1998 USAFACFS ACH; Memorandum for AC, USAFAS, subj: AN/TPQ-36(V)8 Fielding Concerns, 22 Dec 98, Doc III-151, 1998 USAFACFS ACH; Memorandum for Deputy Chief of Staff for Operations and Plans, subj: Suspension of Q36(V)8 Fielding, 4 Jan 99, Doc III-152, 1998 USAFACFS ACH; Memorandum for BG Dean R. Ertwine, Deputy for Systems Acquisition US Army

detect volley fire failed to satisfy the requirement and along with the other deficiencies suggested that version eight was not better than version seven as anticipated and that version eight was not operational and "a go to war system."[211] The false target detections, system lockups, and volley fire requirements had to be corrected before unconditional

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Communications-Electronic Command, subj: AN/TPQ-36(V)8 Fielding Concerns, 23 Dec 98, Doc III-153, 1998 USAFACFS ACH.

[211]Memorandum for BG Dean R. Ertwine, subj: AN/TPQ-36(8) Fielding Concerns, 23 Dec 98.

fielding.[212] As a result, the Army suspended fielding until the software deficiencies could be fixed. Once the software deficiencies had been corrected, the Army initiated fielding the system again to the active component and then planned to field it to the Army National Guard.[213]

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[212]Ibid.

[213]Memorandum for BG Dean R. Ertwine, subj: Suspension of Q36(V)8 Fielding, 7 Jan 99, Doc III-154, 1998 USAFACFS ACH; Interview, Dastrup with Anderson, 17 Feb 99, Interview, Dastrup with Gordon Wehri, Chief, Target Acquisition Branch, Materiel, Requirements, and Integration Division, DCD, 6 Mar 00, Doc III-115.

In the meantime, the Field Artillery School introduced another change to its counterfire radar system modernization program in 1990. Because the existing Firefinder Q-37 radar lacked the range, survivability, mobility, and target processing and identification capability to support future requirements and because the Q-36 modernization effort would not meet all of the Field Artillery's radar requirements as initially planned, the School identified the need for the Advanced Target Acquisition Counterfire System (ATACS) to replace the Q-37. The Q-37, which was 1970s radar technology, was obsolete and vulnerable to enemy radar, radio intercept, and locating and jamming systems. The Advanced Target Acquisition Counterfire System would take advantage of leap-ahead technology to give the Army a passive system or, at a minimum, passive or active cuing, would reduce the equipment and manpower needs significantly, and would furnish support to the corps area of influence in AirLand Operations. In addition, it would be capable of driving on and off a C-130 and larger aircraft and air insertion by CH-47D and would reduce crew size from twelve to six.[214]

In 1991 three alternatives existed to satisfy the Advanced Target Acquisition Counterfire System requirement. First, the Army could start a new research and development program. Second, it could introduce material changes to the existing Q-37 that would be less expensive than a new start. Third, the Army could negotiate a memorandum of understanding with France, the Federal Republic of Germany, and the United Kingdom to enter the European Counterbattery Radar (Cobra) program. Of the three possibilities, the last was the least expensive and most promising. In view of this, the Army opened negotiations with the Europeans in August 1991 to participate in their program, but it lacked funding to proceed beyond this point with Cobra. Later in 1992, the Army withdrew entirely because Cobra was becoming too expensive and large and did not meet the Field Artillery's requirements.[215]

[214]1995 USAFACFS ACH, pp. 141-42.

[215]Ibid., p. 142.

In 1993-1994 the Army chose to upgrade the existing Q-37 to meet its requirements for target acquisition because it was less expensive than a new start. As of 1994, the Enhanced Firefinder AN/TPQ-37 (Block I) program and the Firefinder AN/TPQ-37 Pre-planned Product Improvement (Block II) program existed. Basically, the Q-37 Block I represented an upgrade to the existing Q-37. Enhancements would include improved transportability, better mobility, and the incorporation of MAPS. The reliability, availability, and maintainability of the system would be upgraded through hardware and software improvements. After successful testing was completed at the Yuma Proving Ground, Arizona, production of twenty-six modification kits began in 1995. During the following year, the Army began fielding the Q-37 Block I radar to the active force. Funding, however, limited fielding to twenty-six systems through 1997. This meant that only part of the active force would have the Q-37 Block I radar. The rest were left with the original Q-37 until more funding could be obtained.[216]

The Advanced Target Acquisition Counterfire Radar, renamed Advanced Firefinder System in 1992, the AN/TPQ-37 Firefinder Pre-planned Product Improvement P3I Block II in 1994, the AN/TPQ-37 Block II in 1996, and the AN/TPQ-47 in 1998, offered significant improvements over the existing Q-37. Utilizing advanced technology, the Q-37 Block II would provide rapid and increased target location, improved accuracy, and enhanced target classification at greater ranges. At the same time it would significantly reduce equipment and manpower requirements and improve transportability, maintainability, and reliability for increased effectiveness on the battlefield. Besides this, it would furnish support to the entire corps area of influence with enhanced target processing and multiple friendly fire capability. Although research and development funding would not be available until Fiscal Year 1997, the U.S. Army Training and Doctrine Command (TRADOC) approved the operational requirements document, written by the Field Artillery School, in August 1995. Subsequently, the Department of the Army approved the requirements document in September 1996, and the request for proposal went out to private industry in the fall of 1997 with a contract for three prototypes being awarded to Raytheon in July 1998 and with the operational requirements document being approved in September 1999. Ultimately, the Q-47, would replace all Q-37s, including the Q-37 Block I, on a one-for-one basis and meet the needs of a digitized battlefield.[217]

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[216]Ibid., pp. 142-43; 1997 USAFACFS ACH, p. 95.

[217]1996 USAFACFS ACH, pp. 146-47; 1997 USAFACFS ACH, p. 96; Interview, Dastrup with Ron Anderson, Firefinder Project Manager, DCD, 17 Feb 99; Interview, Dastrup with Wehri, 6

Profiler

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Mar 00; Operational Requirements Document for the AN/TPQ-47 Firefinder Radar, Nov 99, Doc III-116.

In 1999 the U.S. Army Field Artillery School initiated action to replace the existing meteorological measuring set that used antiquated technology by obtaining data from radiosonde instrumentation carried aloft by balloons and sent back to a ground-based receiver with the Profiler. As the operational requirements documents, signed on 15 October 1999 by the Commandant of the Field Artillery School, Major General Toney Stricklin, explained, the Profiler would provide a modernized, real-time meteorological capability over an extended battle space out to five hundred kilometers and would provide vital target area meteorological information from a mesocale model that acquired information from weather satellites, the current radiosonde, and the integrated meteorological system for the employment of smart weapons to ensure proper munition selection and optimal aiming. The Profiler would also furnish field artillery forces with current or expected weather conditions along the projectile trajectory and within the target area.[218]

**The Bradley Fire Support Vehicle and Striker**

In 1999 the U.S. Army Field Artillery School (USAFAS) continued working on type classifying and fielding the Bradley Fire Support Vehicle (BFIST) that was programmed to be the programmed to the M981 Fire Support Vehicle (FISTV). Late in the 1970s, a U.S. Army Training and Doctrine Command (TRADOC) working group, Close Support Study Group (CSSG) II, met to optimize observed fire support for the maneuver forces. Besides reaffirming the necessity of the Fire Support Team (FIST) that had been created in the mid-1970s to integrate fire support with the maneuver arms at the company level, the group recommended fielding a mobile fire support vehicle for

[218]Operational Requirements Document for the Profiler, 15 Oct 99, Doc III-117; Email msg with atch, subj: Radar, GLPS, and Profiler, 10 Mar 00, Doc III-118.

reliable, secure communications.[219]

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[219] 1995 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), p. 144; Interview, Dastrup with MAJ David W. Johnson, Jr., Materiel, Requirements, and Integration (MRI) Division, Directorate of Combat Developments (DCD), 6 Mar 00, Doc III-119; Email msg with atch, subj: BFIST and Eyes for the Light Fighters, 13 Mar 00, Doc III-120; Memorandum for Record, subj: The Bradley Fighting Vehicle, 13 May 94, Doc III-120A.

In its drive to ensure effective fire support, CSSG II considered alternatives to the improved M113 armored personnel carrier that had been designated as the FIST vehicle in the mid-1970s. The first option involved employing the XM2 infantry fighting vehicle/XM3 cavalry fighting vehicle family of vehicles. Either vehicle offered greater mobility and survivability than the M113 and the newer M981. The cavalry fighting vehicle was a derivation of the infantry fighting vehicle with minor interior modifications for crew size, additional ammunition, and equipment storage and did not have the firing ports and associated weapons. The second option centered on adopting the M981. After examining the alternatives the study group recommended fielding the M981 as the Field Artillery's fire support vehicle, retaining the M113, and using both vehicles as interim solutions until the XM2/XM3 (named the Bradley Fighting Vehicle in 1981 after General of the Army, Omar N. Bradley) modified for fire support missions and called the BFIST could be introduced as the long-term solution.[220]

CSSG II did not heartily endorse the M113 or M981 as the fire support vehicle for several reasons. Early in the 1980s, the Army would be fielding the XM1 (Abrams) tank and the XM2/XM3 Bradley, which would provide significant mobility and survivability over the M113 and M981. According to doctrine, the fire support vehicle required mobility and survivability equal to the supported force. Only XM2/XM3 Bradley vehicles modified as a BFIST could furnish the requisite mobility and survivability. In the meantime, the Field Artillery would have to employ M113s and M981s until sufficient numbers of XM2s/XM3 Bradleys were available for fire support, which meant compromising effective close support for the maneuver arms.[221]

Operation Desert Storm (ODS) of 1991 highlighted the deficiencies of the M981 and reaffirmed the necessity of the BFIST. During the war, mobility and sustainability problems hampered the M981's ability to keep pace with the maneuver forces that were equipped with the Abrams tank and the Bradley fighting vehicle. Also, the M981 lacked self-protection against armored threats and presented a unique signature that made it easy to identify as a fire support vehicle, causing it to be an attractive and vulnerable target for hostile fire. In addition, infantry and armor units did not stock sufficient spare parts for the M981 because it was a low-

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[220]1995 USAFACFS ACH, pp. 144-45; Memorandum for Record, subj: The Bradley Fighting Vehicle, 13 May 94; "United Defense LP M2 Infantry Fighting Vehicle/M3 Cavalry Fighting Vehicle," Jane's Armour and Artillery: 1998-1999, p. 375, Doc III-121.

[221]Ibid., pp. 145-46.

density vehicle.[222]

[222] Ibid., p. 146; 1996 USAFACFS ACH, p. 149; 1997 USAFACFS ACH, p. 97; Army Heavy Force Modernization Plan (Extract), p. D-1, Doc III-106, 1998 USAFACFS ACH; Memorandum for Record, subj: The Bradley Fighting Vehicle, 13 May 94; MAJ Neill J. Hamill, "BFIST is on the Way," Field Artillery, May-Jun 97, p. 45, Doc III-122.

After funding became available early in the 1990s and after the maneuver arms got their Bradley fighting vehicles, equipping the Field Artillery with the BFIST became a reality and promised to solve the problems created by the M981. Outlined in the Operational Requirements Document approved by TRADOC in September 1994, the BFIST would have mobility comparable to the supported force, use common repair parts, present a common signature with the supported force, be equipped with a 25-mm. chain gun for self-defense, and have a first-generation forward looking infrared (FLIR) sight and digitization.[223]

As of 1995-1996, combat and materiel developers envisioned two models of BFIST (the M7 and M7A1) with each being a type-classified system. The M7 involved integrating a fire support mission package onto a Bradley A2 ODS chassis. The fire support mission package initially included a laser designator (later removed as a requirement), a ring laser gyro and inertial navigation systems, a forward entry device, a lightweight computer unit, and associated components to process digital information. The A2 ODS would also have a laser ranger finder, a global positioning system, a driver's thermal viewer, and a battlefield combat identification system (when it became available) to reduce the probability of fratricide.[224] With a scheduled fielding in 2004, the M7A1 would be more advanced and use a Bradley M2A3 chassis with the fire support mission package. The M7A1 would add a core electronic architecture to process messages on the digitized battlefield, and would have two second-generation FLIR sights. The second-generation FLIR on the M7A1 would double the target identification range of the first-generation FLIR on the M7.[225]

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[223]1995 USAFACFS ACH, pp. 146-47; 1997 USAFACFS ACH, pp. 97-98; Email msg with atch, subj: BFIST and Eyes for the Light Fighter, 13 Mar 00.

[224]Briefing (Extract), subj: BFIST Overview, Oct 96, Doc III-68, 1996 USAFACFS ACH; Interview, Dastrup with MAJ Neil J. Hamill, BFIST Manager, DCD, 30 Jan 97, Doc III-69, 1996 USAFACFS ACH; LTC Robert M. Hill, "Future Watch: Target Acquisition and Precision Attack Systems," Field Artillery, Jan-Feb 96, pp. 18-19, Doc III-67, 1996 USAFACFS ACH.

[225]1996 USAFACFS ACH, p. 150; 1998 USAFACFS ACH, p. 144; Email msg with atch, subj: BFIST and Eyes for the Light Fighters, 13 Mar 00; Hill, "Future Watch," pp. 18-21; Briefing, subj: BFIST Overview, 1995, Doc III-122A; Briefing, subj: BFIST Overview, Oct 1996, Doc III-122B; Director of Operational Test and Evaluation, Annual Report for FY99 (Extract), subj: BFIST-A3, Doc III-123; "The

Bradley Fire Support Vehicle," Field Artillery, Oct 94, p. 19, Doc III-124; Memorandum for Record, subj: The Bradley Fire Support Vehicle, 13 May 94; Interview, Dastrup with MAJ Neil J. Hamill, DCD, 30 Jan 97, Doc III-124A; Memorandum for Director, Directorate of Combat Developments, subj: Coordination of 1999 Annual Command History, 29 Mar 00, Doc III-124B.

Meanwhile, work on the BFIST moved forward. On 1 October 1996 the contractor, United Defense Partnership, delivered four prototype M7s to the Army for testing. During January-October 1997, technical testing conducted at the Aberdeen Proving Ground, Maryland, focused on system reliability and maintainability, fire support team mission equipment performance, and system integration. Overall, the testing demonstrated that all critical system design characteristics had been met.[226]

The following year, the Army made several critical decisions about the BFIST. In May-June 1997 the Army conducted limited user testing. Using soldiers from the 3rd Infantry Division, the Army placed the M7 BFIST in an operational environment at Fort Sill, Oklahoma, where it functioned as a fire support vehicle for the first time. During the test, the Army encountered software problems that restricted the vehicle's ability to perform its mission as desired. Because the vehicle's overall performance met the requirements during the user test and because the system satisfied design characteristics during the technical testing of early 1997, the Army moved the M7 BFIST into low-rate initial production with the objective of having the initial operational test and evaluation completed in 1999.[227]

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[226]1996 USAFACFS ACH, p. 151; 1997 USAFACFS ACH, p. 98.

[227]1997 USAFACFS ACH, pp. 98-99; Interview, Dastrup with Rick Dies, Dep Dir, MRI, and MAJ Ron Todd, MRI, 2 Mar 99, Doc III-155, 1998 USAFACFS ACH; Army Heavy Force Modernization Plan, 1998, p. D-2; Memorandum for Director,

DCD, subj: Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99, p. 264, Doc III-138A, 1998 USAFACFS ACH; Email msg, subj: BFIST and Eyes for the Light Fighters, 14 Mar 00, Doc III-125; "United Defense LP M2 Infantry Fighting Vehicle/M3 Cavalry Fighting Vehicle," Jane's Armour and Artillery: 1998-1999, pp. 374-79; "United Defense LP M2 Infantry Fighting Vehicle/M3 Cavalry Fighting Vehicle," Jane's Armour and Artillery: 1999-2000, pp. 360-66, Doc III-126; Interview, Dastrup with MAJ Neil J. Hamill, BFIST Manager, DCD, 30 Jan 97; Email msg, subj: BFIST and Eyes for the Light Fighter, 14 Mar 00; Hamill, "BFIST is on the Way," p. 45.

In 1998-1999 the Army reshaped the BFIST programs with additional decisions. Late in 1998, the Army's Heavy Force Modernization Plan announced that the BFIST would go to all heavy brigades and that the more advanced M7A1 would be fielded to the modernized heavy digitized brigades. Based upon the successful limited user tests in 1998, the Army subsequently conducted developmental testing on the M7 BFIST in 1999 and prepared for the initial operational test and evaluation in 2000. In the meantime, the Program Executive Officer for Ground Combat and Support Systems approved Milestone II decision for the M7 BFIST that permitted moving it into low-rate initial production contract.[228]

In the middle of these critical developments, the project

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[228]Interview, Dastrup with MAJ Johnson, 6 Mar 00; Email msg with atch, subj; BFIST and Eyes for the Light Fighters, 13 Mar 00; Email msg, subj: BFIST and Eyes for the Light Fighters, 16 Mar 00, Doc III-127; Interview, Dastrup with Rick Dies, Div Chief, Material Requirements and Integration, DCD, and MAJ Ron Todd, Material Requirements and Integration, 2 Mar 99, Doc III-155, 1998 USAFACFS ACH; Army Heavy Force Modernization Plan, 1998, p. D2, Doc III-106, 1998 USAFACFS ACH; Memorandum for Director, DCD, subj: Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99, Doc III-138A; Memorandum for Director, Directorate of Combat Developments, subj: Coordination of 1999 Annual Command History, 29 Mar 00.

manager for the BFIST modified the acquisition strategy for the M7A1 system by initiating an engineering change proposal to the M7 BFIST to develop it to the A3 BFIST. The vehicle would be based on the Bradley M2A3 chassis and integrate the M7 fire support mission package. Thus, as 1999 drew to a close, the M7 BFIST and the A3 BFIST existed as official Army endeavors to adapt the Bradley fighting vehicle to fire support missions.[229]

[229]Email msg, subj: BFIST and Eyes for the Light Fighters, 14 Mar 00; Email msg with atch, subj: M7 vs A3 BFIST Comparison, 18 Mar 00, Doc III-128; Memorandum for Director, Directorate of Combat Developments, subj: Coordination of 1999 Annual Command History, 29 Mar 00.

Meanwhile, the Combat Observation Lasing Team (COLT) also employed the M981 fire support vehicle. Besides lacking mobility and stealth, the M981 had been designed for armored and mechanized forces and presented a unique signature in forces that used High Mobility Multipurpose Wheeled Vehicles (HMMWVs) as their scout vehicles. In response to this discrepancy, TRADOC approved a change to the Fire Support Vehicle Operational Requirements Document in April 1997, written by the Field Artillery School, to leverage fire support vehicle technology for heavy and light forces. In the Operational Requirements Document the Field Artillery School retained the BFIST for the heavy forces and urged developing a vehicle with BFIST mission capabilities for the COLTS by integrating the fire support mission equipment package onto a HMMWV chassis, known as the Striker, to provide COLTS with unprecedented mobility, flexibility, and stealth to replace the M981. Also, the Striker would be less noticeable because it would present a common signature, would save Bradley assets for fire support teams, and would lower operating costs for COLTs. Based upon its performance in the Task Force XXI Advanced Warfighting Experiment of March 1997, the Striker vehicle, as well as the Striker concept that furnished six Striker vehicles to each heavy maneuver brigade, was adopted by the U.S. Army and was approved as a Warfighting Rapid Acquisition Program (WRAP) by the Chief of Staff of the Army on 14 May 1997. This meant development and fielding could be accelerated.[230]

In July through October 1998 the Army conducted customer testing on a prototype Striker vehicle at the Yuma Proving Ground, Arizona, as a result of WRAP. Although testing revealed daytime vision to be good, nighttime vision failed to meet the requirements. Equipped with a Ground/Vehicle Laser Locator Designator (G/VLLD) with a first-generation Forward-Looking Infrared (FLIR) thermal night sight, the Striker lacked the ability to see far enough in the night during testing. Even so, the Army approved low-rate initial production in September 1998 with the caveat that the night vision capability had to be extended to meet the requirement and scheduled the first major test in the second quarter of FY 2000.[231]

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[230]Memorandum for Director, DCD, subj: Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99, Doc III-138A, 1998 USAFACFS ACH; 1997 USAFACFS ACH, p. 99; Email msg with atch, subj: BFIST and Eyes for the Light Fighters, 13 Mar 00; Memorandum for Director, Directorate of Combat Developments, subj: Coordination of 1999 Annual Command History, 29 Mar 00, Doc III-124B.

[231]Interview, Dastrup with Rick Dies and MAJ Ron Todd, MRI, 2 Mar 99; Memorandum for Director, DCD, subj:

Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99; Memorandum for Director, Directorate of Combat Developments, subj: Coordination of 1999 Annual Command History, 29 Mar 00.

In 1999 several critical events with Striker occurred. Early in the year, the Army type-classified the system as the M707 Striker and conducted a successful air drop test to demonstrate Striker's ability to be dropped from an aircraft. Also, the contractor built three prototypes for developmental and operational testing in 2000.[232]

**The Lightweight Laser Designator Rangefinder**

Early in the 1990s, fire supporters employed the Ground/Vehicular Laser Locator Designator (G/VLLD) to lase targets for location and precision-guided munitions. The system weighed 107 pounds, reduced the mobility of light fire support teams, and did not meet their needs. In response to this situation and the lack of a man portable system to designate targets, the U.S. Army Field Artillery School wrote an Operational Requirements Document that was approved in February 1994 by the U.S. Army Training and Doctrine Command (TRADOC) to replace the G/VLLD with the Lightweight Laser Designator Rangefinder (LLDR). Although the LLDR remained unfunded for several years, the School still pursued it. Combining technological advances in position/navigation (Precision Lightweight Global Positioning System), thermal sights, and laser development, the LLDR was a lightweight, compact, man-portable system designed for dismounted or mounted operations. Besides determining range, azimuth, and vertical angle, the LLDR would permit light forces to perform fire support functions quickly and accurately on a fast-paced, less dense, and more lethal battlefield and would offer the best alternative to the G/VLLD. Because of its modular design, it could be readily tailored to the mission. In its target location configuration the LLDR weighed about twenty pounds and had the ability of locating targets accurately out to ten kilometers and seeing the battlefield with a near, all-weather capability at shorter ranges. An integrated thermal night-sight provided continuous day/night operations and the ability to see through obscurants, such as fog and smoke. If

[232]Interview, Dastrup with LTC Johnson, 6 Mar 00; Email msg with atch, subj: BFIST and Eyes for the Light Fighters, 13 Mar 00.

needed, the LLDR could be configured with a separate laser designator module to designate moving and stationary targets for precision munitions. This configuration increased the system's weight to thirty-five pounds. Equally important, the LLDR could be used in training environments because of its eye-safe rangefinder.[233]

[233] 1997 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), pp. 99-100; Memorandum for Director, Directorate of Combat Developments, subj: Coordination of 1999 Annual Command History, 29 Mar 00, Doc III-124B.

In 1996-1997 the situation with the LLDR changed dramatically. Recognizing the need for such a piece of equipment, the Program Management Office for Nightvision funded the LLDR through the end of engineering and manufacturing development, while the Field Artillery School made the system an initiative of the Task Force XXI Advanced Warfighting Experiment of March 1997. During the experiment, the surrogate LLDR performed well and was subsequently approved as a Warfighting Rapid Acquisition Program (WRAP) in April 1997. WRAP status would accelerate fielding to the light forces and integration onto the Striker. As a final design review of June 1998 indicated, the LLDR satisfied the requirements, and work on a baseline production model began during the latter months of 1998. Additionally, funding was approved to pursue development of a longer range variant that could meet the Striker's thermal range requirements. However, technical problems with the software and hardware forced slipping developmental testing from 1999 to 2000.[234]

**The Gunlaying and Positioning System**

As work was moving forward with LLDR, the Field Artillery School took steps to acquire the Gun Laying and Positioning System (GLPS). For years the field artillery battalion provided survey. This meant that towed howitzer batteries and M109A5 155-mm. self-propelled howitzer batteries had to wait for conventional survey to be furnished by the battalion, which was time consuming and inefficient, in order to furnish accurate fires. In light of this, the Field Artillery School wrote an Operation Requirements Document that was approved by TRADOC in July 1993 for the GLPS. The system would be a tripod-mounted positioning and orienting device that consisted of a gyroscope, an electronic theodolite, an eye-safe laser rangefinder, and a Precision Lightweight Global Position System Receiver and that would give the battery autonomous

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[234]Memorandum for Director, DCD, subj: Coordination of 1998 USAFACFS Annual Command History, 29 Mar 99; Interview, Dastrup with Rick Dies and MAJ Ron Todd, Materiel Requirements and Integration, DCD, 2 Mar 99; Interview, Dastrup with LTC David Johnson, MRI, 6 Mar 00

positioning and directional capability. Lightweight and mobile, the GLPS established an orienting station, allowed the battery commander to position and orient his howitzers accurately and rapidly, and permitted retaining the unreliable and old Positioning and Azimuth Determining System in reserve as a backup. Based upon its performance in Task Force XXI Advanced Warfighting Experiment of March 1997, GLPS was approved to be part of the Army's Warfighting Rapid Acquisition Program, which would expedite fielding.[235]

[235]1997 USAFACFS ACH, p. 101; Memorandum for Cdr, U.S. Army Training and Doctrine Command, subj: GLPS, 22 Mar 93, Doc III-129.

In 1998 the Army tested GLPS prototypes and revised the number to be fielded. Initial operational testing and evaluation in July-October 1998 and subsequent climatic testing in Alaska and Australia demonstrated the GLPS's overall ability to withstand wide ranges in temperature and to operate below the equator, even though accuracy and correctable maintenance problems existed, and permitted moving into follow-on testing and evaluation in 1999 and fielding to the Total Army beginning with the active Army in 1999 and then the Army National Guard in 2000. In the meantime, the growing need to reduce the amount of work by the survey team in light units, the Army decided to expand the number of GLPSs from one per battery to two per battery.[236]

**Advanced Field Artillery Tactical Data System**

Almost ten years after the Field Artillery had initially recognized the need for a computer for command, control, and communications to improve its responsiveness on a mobile battlefield, it gained its first experience with the application of automated data processing in 1959 with the development of the Field Artillery Digital Automated Computer (FADAC). The computer calculated technical fire direction data faster and more accurately than humans could and promised highly precise and rapid fire. However, the breakdown of equipment, the requirement to back up the computer with manual procedures, and the lack of education about the computer's capabilities caused many Field Artillerymen of the late 1950s and early 1960s to accept computerized gunnery reluctantly.[237]

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[236]Interview, Dastrup with Rick Dies and MAJ Ron Todd, Materiel Requirements and Integration Division, DCD, 2 Mar 99; Interview, Dastrup with Gordon Wehri, Chief, Target Acquisition Branch, Materiel, Requirements, and Integration Division, DCD, 6 Mar 00.

[237]1995 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH), p. 148. See General Accounting Office Report, subj: Battlefield

Automation, Nov 95, Doc III-129A, for background information on the Army's effort to digitize its forces.

The drive for better responsiveness as the battlefield was becoming more mobile and desire for first-round accuracy encouraged the Army to develop a second-generation computer for field artillery command, control, and communications. Between 1961 and 1965 the Army conducted extensive studies to determine where the improvements to automation should be made. The results of the studies led to the requirement for the Tactical Fire Direction System (TACFIRE), which was fielded in the mid-1970s and computed technical and tactical fire direction data.[238]

Because TACFIRE was large, heavy, and based on 1950s and 1960s technology, the Army took steps to replace it. In response to a memorandum of 13 November 1978 from the Office of the Undersecretary of Defense for Research and Engineering that authorized a new computer for fire support command, control, and communications, the Army initiated work on a successor system that would optimize operational efficiency, simplify training, ease maintenance requirements, reduce life cycle costs, and improve survivability. Later in 1981, the Army and the Department of Defense (DOD) approved developing the Advanced Field Artillery Tactical Data System (AFATDS) as part of the Army Tactical Command and Control System (ATCCS), which would be a family of computers, peripherals, operating systems, utilities, and software to support each individual battlefield operating system.[239]

After a decade of work on the hardware and the software that was fraught with many software developmental delays, the Army started testing AFATDS to determine its readiness for fielding. According to the Field Artillery School in 1990, AFATDS represented a complete departure from TACFIRE. Whereas AFATDS offered distributive (decentralized) processing using office computers, networking of computers, and employing task menus, TACFIRE depended upon centralized command and control and was a format driven system. TACFIRE taxed training because the operator had to memorize many formats and legal entries and had to use them frequently to remember them. As such, AFATDS would be more user friendly and a significant

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[238]Ibid., pp. 148-49; Memorandum for Boyd Dastrup, subj: Untitled, 26 Feb 99, Doc III-157, 1998 USAFACFS ACH.

[239]1996 USAFACFS ACH, pp. 152-53.

improvement over TACFIRE.[240]

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[240]*Ibid*., p. 153.

Work on the software for AFATDS pressed forward in 1990-1991. On 27 April 1990 the Army signed the full-scale development contract with Magnavox for version one (later renamed AFATDS 96) software. Scheduled for fielding in 1992, version one (AFATDS 96) would update the software developed for the concept evaluation program that was conducted late in 1989, provide initial functionality at all echelons of fire support from the corps to platoon level, and would integrate field artillery, mortar, naval gunfire, and close air support into planning and execution functions. In fact, the Preliminary Design Review held in November 1991 verified moving version one (AFATDS 96) software into the critical design phase of development with Force Development Testing and Experimentation (FDTE) scheduled for September 1993. However, software problems forced rescheduling the FDTE for October 1993. Work on version two (later renamed AFATDS 97) software, which would have more capabilities than version one (AFATDS 96), in the meantime, began during the latter months of 1992. Subsequently, a private contractor or the government would produce version three (subsequently renamed AFATDS 00) software, which would have even more capabilities than the other two versions and would meet the objective system requirements.[241]

Technical problems with version one (AFATDS 96) software arose during technical testing in 1993 and caused delaying the FDTE again. In fact, in August 1993 the Army slipped the FDTE from October 1993 to January 1994. Pushing back the FDTE also forced moving the Initial Operational Test and Evaluation (IOTE) from May-June 1994 to July-September 1994. Further version one (AFATDS 96) software developmental problems caused the IOTE to be moved into mid-1995.[242]

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[241] Ibid., pp. 153-54.

[242] Ibid., pp. 154-55.

After the FDTE of May 1995 had determined that version one (AFATDS 96) had been improved since the initial testing and was ready for operational testing, the U.S. Army Operational Test and Evaluation Command held an Initial Operational Test and Evaluation in July-September 1995 at Fort Hood, Texas. The test unit, the 1st Cavalry Division, conducted a pilot test, a record test, and an interoperability test. Although the tests revealed some deficiencies, no single or aggregation of deficiencies warranted rating the system as being ineffective. During the tests, version one (AFATDS 96) demonstrated the ability to receive and process information from a variety of sources to support tactical field artillery fire plans and showed that it enhanced the maneuver commander's control of fire support. In view of this and the overall success of the test, the Office of the Assistant Secretary of the Army for Research, Development, and Acquisition authorized the Program Executive Officer for Command, Control, and Communications Systems in December 1995 to proceed with full-rate production with AFATDS and to field version one (AFATDS 96) software. In 1996-1997 the Army sent the software through many technical and operational tests to ensure that deficiencies identified in the 1995 IOTE had been resolved and fielded version one (AFATDS 96) to a division artillery, three corps artilleries, two army fire support elements, three battlefield coordination detachments, an enhanced deep operations coordination cell, and command post Tango in Korea units.[243]

In the midst of developing, testing, and fielding of the version one (AFATDS 96) software, the Field Artillery School participated in Task Force XXI Advanced Warfighting Experiment (AWE) in 1997 that focused on the digitized brigade of 2003. The AWE consisted of live and constructive simulations and culminated with a brigade task force rotation at the National Training Center, Fort Irwin, California, in March 1997 and employed AFATDS hardware and an experimental version of version two (AFATDS 97) software as one of its digitized systems. As might be expected, the AWE produced key lessons for version two (AFATDS 97). One officer in the TRADOC System Manager (TSM) AFATDS in the Field Artillery School noted that most difficult challenge for combat developers was introducing software in the age of computers and the digitization of

[243]Ibid., p. 155; "AFATDS Update," Field Artillery, Mar-Apr 98, p. 34, Doc III-158, 1998 USAFACFS ACH; FY 95 Report (Summary), Director of Operational Test and Evaluation, subj: AFATDS, Doc III-159, 1998 USAFACFS ACH; FY 97 Report (Summary), Director of Operational Test and Evaluation, subj: AFATDS, Doc III-160, 1998 USAFACFS ACH; Report, subj: Assessment Report for the Division XXI AWE, Jan 98, Section 3, Doc III-67, 1998 USAFACFS ACH.

military forces. Under the AFATDS development and fielding concept the unit received the complete hardware package just prior to new equipment training. However, the Army did not deliver the objective AFATDS software. It delivered AFATDS software incrementally in a series of versions, as previously mentioned, with each building on the previous one.[244]

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[244]1997 USAFACFS ACH, pp. 104-05.

As TSM AFATDS pointed out, this software fielding format produced training challenges. Units had to train and qualify operators at fielding, had to furnish sustainment training on existing software, and had to provide training on each software version as it was delivered. For example, the Task Force XXI variant of version two (AFATDS 97) was immature and untested. In an effort to optimize the software, combat developers and software engineers continued to issue improvements to version two (AFATDS 97) right up until the start of the AWE. The battalion literally loaded new software as it prepared for the AWE. As a result, operators and leaders neither fully understood nor were trained on the new software.[245]

In view of this experience with Task Force XXI and the time lost because of unexpected software problems, the Army and TSM AFATDS concluded that they had to modify the fielding format. They had to permit time for training to be completed. For example, in the sixty days preceding the Division AWE of late 1997 that followed the Task Force XXI AWE, the unit received no new version two (AFATDS 97) changes so that training could take place. This gave leaders and operators confidence with the software and their ability to fight digitally. Also, the Division AWE indicated that the Army and TSM AFATDS had to expedite fixes identified by commanders in the software and get them to field sooner so that training could be completed.[246]

Meanwhile, as the AWEs were taking place, the Army planned to field three different variations of AFATDS version two between 1997 and 1999 as AFATDS 97, AFATDS 98, and AFATDS 99 and version three AFATDS software in 2000 as AFATDS 00. As explained by U.S. Army Training and Doctrine Command (TRADOC) System Manager for Fire Support Command, Control, and Communications (FSC3) in the fall of 1996, the releases would

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[245] Ibid., p. 105; "AFATDS Update," Field Artillery, Mar-Apr 98, p. 34; Report, subj: Assessment Report for the Division XXI AWE, Jan 98, Section 3.

[246] 1997 USAFACFS ACH, p. 105; Report, subj: Assessment Report for the Division XXI AWE, Jan 98, Section 3.

enhance corps and echelons-above-corps deep operations functions, joint capabilities, and Multiple-Launch Rocket System (MLRS) and Paladin howitzer interfaces and lead to full technical fire direction capabilities. Specifically, AFATDS 97 would furnish corps and echelons-above-corps functionality, modify MLRS/Army Tactical Missile System (ATACMS) command and control processes, and enable the Field Artillery to plan and execute deep battle operations faster and safer than ever before.[247]

[247]1996 USAFACFS ACH, pp. 155-56.

AFATDS 98, AFATDS 99, and AFATDS 00 would provide additional capabilities. To be released in 1998, AFATDS 98 would concentrate on U.S. Marine Corps/joint functionality, meet Department of Defense computing standards, and facilitate greater interoperability among the services. AFATDS 99, scheduled for release in 1999, would begin the move toward technical fire direction on a single platform by building direct interfaces with MLRS and Paladin, while AFATDS 00 (version three) would be the objective system and would be released in 2002. With AFATDS 00 software, AFATDS, as planned in 1997, would automate all 321 specified fire support tasks developed at the Field Artillery School. Moreover, AFATDS would operate in the fire support element and fire support coordination centers of the supported maneuver force and field artillery command posts, fire direction centers, and selected field artillery elements throughout the command structure to furnish integrated, responsive, and reliable fire support. Reflecting upon the state of AFATDS development, a conference held at the U.S. Army Field Artillery School in June 1998 concluded that AFATDS was on the right track and that it would greatly facilitate command, control, and communications for field artillery units.[248]

Technical problems and Task Force XXI recommendations, in the meantime, delayed fielding AFATDS 97 from 1997 into 1998. Following a limited users test in October 1997 to ensure that deficiencies cataloged in previous tests had been resolved and following the integration of functional improvements

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[248]1997 USAFACFS ACH, p. 104; Msg, subj: Annual History Report, 2 Feb 99, Doc III-161, 1998 USAFACFS ACH; Fact Sheet, subj: AFATDS, 29 Oct 98, Doc III-162, 1998 USAFACFS ACH.

identified during Task Force XXI, the Army released AFATDS 97 in April 1998 and fielded it to the XVIII Airborne Corps artillery, the 82nd Airborne Division artillery, the 101st Airborne Division artillery, and the 2nd Battlefield Coordination Detachment during the course of 1998. For units already equipped with AFATDS 96, new equipment training teams conducted five weeks of training on AFATDS 97 that focused upon the differences between the two version.[249]

[249]"AFATDS Update," Mar-Apr 98, p. 34; Msg, subj: Annual History Report, 2 Feb 99; LTC Douglas G. Beley, "AFATDS and the Task Force AWE," Field Artillery, Jan-Feb 98, p. 4, Doc III-163, 1998 USAFACFS ACH; "AFATDS Update,: Field Artillery, May-Jun 98, p. 17, Doc III-164, 1998 USAFACFS ACH; "AFATDS Update," Field Artillery, Sep-Oct 98, p. 27, Doc III-165, 1998 USAFACFS ACH; FY 97 Report (Summary), Director of Operational Test and Evaluation, subj: AFATDS; FY 98 Report (Summary), Director of Operational Test and Evaluation, subj: AFATDS.

Based upon existing and future capabilities of AFATDS, the Assistant TRADOC System Manager for AFATDS in the Field Artillery School, Lieutenant Colonel Douglas G. Beley, early in 1998 postulated a paradigm shift in fire control. With TACFIRE or the Initial Fire Support Automated System (IFSAS) the fire direction center was the nucleus for planning and delivering fires. In AFATDS units the fire support officer's role would expand to "focus the artillery fight during both planning and execution."[250] The brigade fire support officer would orchestrate the field artillery battle using AFATDS fire support tools. "Many activities and, more importantly, fire support decisions traditionally expected of the fire direction officer [would] become the FSO's [fire support officer's]. Decisions to modify attack guidance and priority of fires now can be made and implemented at the brigade FSE [fire support element]," Colonel Beley wrote in the January-February 1998 edition of Field Artillery.[251] Ultimately, the key to massing battalion fires and focusing fires to support the brigade commander would be a well-trained brigade and battalion fire support officer. Only time would tell if the forecast was accurate.[252]

In effort to ensure that its Total Army capabilities and power projection responsibilities were met, in the meantime, the Army revised the fielding schedule for AFATDS in 1998. The new fielding methodology established by the Army determined that "first-to-fight" units with their "go-to-war" reserve supporting units would be fielded first and less critical active component units and their supporting reserve units would be fielded next. Under the old practice the active component units were scheduled to receive AFATDS

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[250]Beley, "AFATDS and the Task Force AWE," p. 5. See Email msg, subj: AFATDS, 2 Mar 00, Doc III-129B, for the correct position of LTC Beley.

[251]Ibid.

[252]Ibid.

through Fiscal Year (FY) 2004, and then all National Guard units would be fielded from FY 2004 through FY 2008. This practice created a disconnect because many Army National Guard roundout units would not have AFATDS, while their active component units would have it.[253]

[253]Msg with Atchs, subj: Revised AFATDS Fielding Plan, 12 Feb 99, Doc III-167, 1998 USAFACFS ACH.

Meanwhile, the Army continued work on AFATDS 98 that would replace AFATDS 97. In October-November 1998, the Army conducted a joint U.S. Marine Corps and Army limited users test to examine AFATDS 98's ability to satisfy U.S. Marine Corps requirements and identified deficiencies in air operations, naval surface fire support, trigger events, fire planning, and attack aviation. The following June-July 1999, the Army held another test to determine if the deficiencies had been corrected. Besides demonstrating solutions to problems identified during the limited user test of 1998, the 1999 test noted that the latest version of AFATDS 98 had difficulties transferring and receiving friendly and enemy unit status information through the U.S. Marine Corps Tactical Combat Operations, was unable to process air support requests, air tasking orders, and airspace control orders effectively, and was unable to execute fire plans consistently. Yet, the problems were correctable, and AFATDS 98 would be fielded to the 17th Field Artillery Brigade, the 214th Field Artillery Brigade, 75th Field Artillery Brigade, the 18th Field Artillery Brigade, and 10th Mountain Division in 2000.[254]

## DEPTH AND SIMULTANEOUS ATTACK BATTLE LABORATORY

### Precision Engagement

In December 1999 the Depth and Simultaneous Attack Battle Laboratory submitted a proposal to the Department of the Army staff, the U.S. Army Training and Doctrine Command (TRADOC) at Fort Monroe, Virginia, and the Combined Arms Center at Fort Leavenworth, Kansas, to consolidate responsibility for issues with precision engagement, which was one of the principle thrusts of Joint Vision 2010. In the proposal the Battle

[254]FY 99 Annual Report, Director of Operational Test and Evaluation, subj: AFATDS, Doc III-130; Interview with atch, Dastrup with William Sailers, Dep Dir, TSM AFATDS, 29 Feb 00, Doc III-131; Fact Sheet, subj: AFATDS, Apr 99, Doc III-132; Briefing (Extact), subj: AFATDS Accomplishments, Dec 99, Doc III-133; "AFATDS Update," Field Artillery, Jan-Feb 00, p. 5, Doc III-134.

Laboratory explained that recent events had raised serious concerns regarding the Army's involvement in precision engagement. In fact, the Army lacked a unified position on many precision engagement issues, including joint targeting and digital integration. Units lacked a single point of contact to resolve complex issues, while the Army was not always represented at critical joint forums.[255]

[255]Email msg with atch, subj: Precision Engagement at the Battle Lab, 25 Feb 00, Doc III-135.

Continuing, the Battle Laboratory added that expertise was required to develop and implement fully an Army precision engagement strategy that resided at several locations. The Depth and Simultaneous Attack Battle Laboratory had the experience with precision engagement and joint target issues as the operational manager of several advanced concept technology demonstrations and had established working relationships with the battlefield coordination detachments and deep operational coordinating cells. The Battle Laboratory envisioned the cooperation of the Intelligence, Aviation, Field Artillery, and other TRADOC centers as needed, the Combined Arms Center, and the Army Battle Command System TRADOC managers to review issues of common concern related to weapons, sensors, organizations, or automation that supported the goals of precision engagement.[256]

**Theater Precision Strike Operations Advanced Concept Technology Demonstration**

On 21 November 1997 the Department of Defense approved Theater Precision Strike Operations Advanced Concept Technology Demonstration as a new start for Fiscal Year (FY) 1998 that would run for six years in response to the Joint Forces Land Component Commander's requirement for an enhanced capability to conduct theater precision engagements and fires. In exercises planned for FYs 1999, 2000, and 2001, the demonstration would exercise and evaluate existing and emerging technology on a synthetic battlefield that would incorporate live, virtual, and constructive simulations. The objective of the demonstrations centered on improving the strike planning process, expanding shared situational awareness, increasing joint and combined interoperability, and improving transition to reinforcement. At the same time the demonstration would provide emerging leave-behind capabilities with U.S. forces in the United States and Korea.[257]

In 1998 and 1999 the Theater Precision Strike Operations Advanced Concept Technology Demonstration conducted its first exercises. During those years, the Depth and Simultaneous Attack Battle Laboratory provided extensive support for Foal Eagle, Reception, Staging, Onward Movement and Integration, and Summer Exercise and Ulchi Focus Lens. These exercises demonstrated new capabilities to enhance interoperability among Army, Navy, and Air Force automated systems, fighting the counterfire battle, and identifying operational level

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[256] Ibid.

[257] 1997 USAFACFS ACH, p. 63; Email msg with atch, subj: TSPO History Piece, 8 Mar 00, Doc III-136; Fact Sheet, subj: Theater Precision Strike Operations, Apr 99, Doc III-137.

requirements.[258]

[258]Memorandum for Record, subj: Battle Lab Input to 1998 Annual Command History, 22 Mar 99, Doc III-96, 1998 U.S. Army Field Artillery Center and Fort Sill (USAFACFS) Annual Command History (ACH).

Other key efforts occurred. During 1999, for example, joint interoperability activities included the development of an interface between Army and Air Force systems to address the inability to request digitally a cross service asset to attack time critical targets and to co-host the Automated Deep Operations Coordination System on the Army supported Global Command and Control System-Army. Rapid prototyping endeavors involved the development of a web client for the Advanced Field Artillery Tactical Data System (AFATDS) to provide access to the AFATDS database and the real time U.S.-only Counterfire Common Operational Picture. Other works consisted of the development of a three-dimensional viewer scene generation tool to use National Imagery and Mapping Agency map date products better and a capability to permit near real time electronic intelligence displays from the All Source Analysis System Intelligence System.[259]

The Depth and Simultaneous Attack Battle Laboratory also continued to integrate entity-level fire support simulation into the Corps Battle Simulation to improve training of fire support tasks during the Korean exercises and the Theater Precision Strike Operations Advanced Concept Technology Demonstration. The effort included initiatives to allow tactical command and control systems to communicate with simulations and to field the Fire Support Simulation Trainer to Korea and updates to simulation models.[260]

**Fire Support Combined Arms Tactical Trainer**

On 10-28 June 1999 the Depth and Simultaneous Attack Battle Laboratory conducted the Fire Support Combined Arms Tactical Trainer (FSCATT) M109A6 variant customer test. The test was successful, and FSCATT production lot IV contract for ten M109A6 variants was subsequently signed on 14 January 2000. A noise reduction engineer change proposal was approved in 1999 for FSCATT and was programmed to be applied as kits in Fiscal Year 2000. A total of thirty-four M109A5 variants and eleven M109A6 variant FSCATTs would be fielded upon completion of lot IV, and funding for additional FSCATTs to fill the basis of issue plan requirement did not exist as the end of 1999. Production was scheduled to end after lot IV.[261]

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[259]Email msg with atch, subj: TSPO History Piece, 8 Mar 00.

[260]Email msg with atch, subj: TSPO History Piece, 8 Mar 00.

[261]Email msg with atch, subj: Annual Historical Report, 6 Mar 00, Doc III-138; "FSCATT for the Gunnery Team," Field Artillery, Sep-Oct 99, p. 41, Doc III-139; MAJ James B. Brashear, "Fire Support Combined Arms Tactical Trainer," Field Artillery, Mar-Apr 00, pp. 24-26, Doc III-139A; Fact Sheet, subj; FSCATT, 16 Oct 98, Doc III-139B; Operational

Fire Support/Senior Observer Controller Team

Requirement Documents for the FSCATT (Extract), Mar 93, Doc III-139C

During 1999, the Depth and Simultaneous Attack Battle Laboratory organized a Senior Observer Controller Team to meet the training needs of tactical units. The team was comprised of experienced, retired military personnel, who were provided comprehensive, mobile, fire support digital staff training and assessment capability for active component and Army National Guard field artillery units.[262]

As planned, the training audience consisted of field artillery brigades or division artillery commanders and staffs along with subordinate battalion commanders and their staffs. The team was to coordinate, plan, and execute a robust biannual/annual digitally-based training event designed to assist the commander in assessing the state of the unit's training readiness. Following the exercise, the team would assist the commander in developing a comprehensive mission/mission essential task list based training plan to sustain the unit's digital skills at the individual, team, and collective battle staff levels. The team would also mentor the staff, would recommend solutions, would facilitate after action reports, and would assist in the development of a digital training plan. In addition, the team would provide platform instruction and exercise support for U.S. Army Field Artillery School students undergoing training on brigade and battalion digital fire support and digital battle staff operations. This would initially be in support of the Precommand Course and the Captain Career Course and would furnish the capability to review and recommend changes to fire support doctrine and doctrinal publications.[263]

North Korean Architecture Analysis

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[262]Email msg with atch, subj: Annual Historical Report, 6 Mar 00.

[263]Ibid.

At the 17 November 1998 briefing on Counter Artillery Force Protection and the Short Range Defense with Optimized Radar Distribution, the Deputy Secretary of Defense asked the Assistant Secretary of the Army for Acquisition Technology and Acquisition and the Defense Advanced Research Projects Agency to commit to a program for an architecture study and evaluation of the North Korean threat. At the time the threat was defined as 240-mm. and 122-mm. multiple rocket launchers and 170-mm. cannons with and without weapons of mass destruction. The Assistant Secretary of the Army for Acquisition Technology and Acquisition and the Defense Advanced Research Project Agency agreed to look for technologies, organizations, and procedures that could be introduced in Fiscal Years 2000-2005 and 2005-2015 and that could limit or negate the North Korean threat. Both the Assistant Secretary of the Army for Acquisition Technology and Acquisition and the Defense Advanced Research Project Agency designated the Depth and Simultaneous Attack Battle Laboratory as the lead agent for attack operations and the responsible agent for coordinating and integrating attack operations and active defense in the analysis.[264]

The analysis consisted of two coordinated evaluations executed concurrently by the Depth and Simultaneous Attack Battle Laboratory and the Air and Missile Defense Battle Laboratory. The Depth and Simultaneous Attack Battle Laboratory's evaluation would focus on attack operations, while the other laboratory's endeavor centered on active defense. These evaluations would be executed through the use of high-resolution simulation environments consisting primarily of FireSim XXI and EADSIM models. These simulation environments would leverage past and current efforts and integrate force structures that included attack operations and active defense weapon systems, projected command, control, communications, computers, and intelligence (C4I) architectures, and current and future munitions. To ensure consistency and comparable analysis results, common and agreed upon assumptions, modeling tools, scenario, force structures, and methodologies would be used by all members of the analytical team.[265]

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[264]Email msg with atch, subj: None, 13 Mar 00, Doc III-140.

[265]Ibid.

Future Fires Command and Control Concept Evaluation Program

From 19 October to 16 November 1999, the Future Fires Command and Control Concept Evaluation Program was conducted at the Depth and Simultaneous Attack Battle Laboratory to examine operational systems and personnel requirements for organizational transformation (separating command from tactical fire control) and effects management (effects-based fires and the establishment of the Effects Coordination Cell), which were two key tenets of the U.S. Army Field Artillery Vision. A fires test bed was established to provide the operational setting for the experimentation. It consisted of two command post vehicle mock-ups, a surrogate battle command system, crew access units for voice communications, and interactive simulations to furnish the synthetic theater of war environment. The Janus simulation simulated maneuver, engineer, army aviation, and close air support systems, and FireSim XXI simulated fire support systems. Both systems interacted with the surrogate battle command system, the Future Fires Decision Support System, designed for this experiment to support execution of future fires concepts. Player control cells provided any additional simulation required by the field artillery battalion to perform its functions prescribed by the Vision. In a series of war gaming events executed by an actual field artillery battalion staff, the Laboratory evaluated procedures for commanding and controlling a composite battalion, for information management in effects-based fires controlled at the brigade effects coordination cell, and for the usability and functionality of the Future Fires Decision Support System. The Future Fires Decision Support System was employed in a networked environment that allowed all users to operate from a common operational picture that was populated by a distributed data base. It included a set of graphical decision making tools for planning and execution of battle management functions (situation awareness, distributed planning, war gaming/mission rehearsal, and terrain analysis). It was anticipated that streamlining and flattening organizations combined with enabling information technologies would improve performance by promoting shared situation understanding, improving asset visibility and sensor-weapon pairings, and eliminating redundancy in the tactical fire control process to decrease the sensor to shooter time line.[266]

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[266]Email msg with atch, subj: BL History, 14 Mar 00, Doc III-141.

In summary, the battalion staff structure and functions were realigned so that effects-based fires were generated by the Effects Coordination Cell, which processed cannon, rocket, attack aviation, and close air support lethal effects while the battalion was primarily responsible for logistics, force protection, and movements. Although the proposed battalion staff structure and functions were found to be about right for planning and conducting mid- to high-intensity operations, the force protection role was new. It required skills that were significantly different from those of the intelligence officer. The combat service support function, integrated with the battle staff, proved invaluable for synchronizing fires and performing sustainment functions to support the maneuver fight. The Future Fires Decision Support System common operational picture improved battlefield visualization and facilitated distributed operations, allowing command posts to share information essential to mission accomplishment. The total asset visibility and logistics planning aids significantly reduced the level of effort required to track ammunition within the battalion. Use of these advanced technologies allowed the staffs to shift their focus from information gathering and updating to collaboration and problem solving. In addition to the insights regarding the field artillery battalion staff, the Laboratory gained an understanding of the effects coordination cell organization, functions, and preliminary procedures for functioning as an effects clearing house. A concept for follow-on experimentation involving modeling and operations of an initial brigade effects coordination cell was approved by the U.S. Army Training and Doctrine Command and was scheduled to be executed in Fiscal Year 2000.[267]

**Advanced Fire Support System**

In 1998 the Defense Advanced Research Project Agency (DARPA) initiated the Advanced Fire Support System program to apply advanced technologies in the design, development, and demonstration of an affordable, containerized, platform independent, indirect fire weapon system that would be capable of performing a variety of missions in support of Army 2010 and beyond. As outlined in 1999-2000, the program would consist of three phases. Phase one (Concept Definition) that lasted from January 1998 to December 1998 produced a baseline concept as well as effectiveness and cost analysis. Basically, the Advanced Fire Support System would consist of missiles and a computer unit in a container that would come in a standardized shipping configuration to permit easy deployment and that could be delivered by air, sea, or ground and would provide a rapidly deployable and highly lethal fire

[267] Ibid.

capability across the full spectrum of conflict.[268]

In February 1999 the program entered phase two with phase three scheduled to begin in January 2000. During phase two, the Depth and Simultaneous Attack Battle Laboratory, which was the operational manager of the program, provided input to the contractors during initial program reviews. The reviews narrowed down the specific design, the risk reduction, and the demonstration of critical components. During phase three, the system would be fabricated; and a demonstration test launch of the missiles would occur.[269]

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[268]Fact Sheet, subj: Advanced Fire Support System, Apr 99, Doc III-142; Email with atch, subj: AFSS History, 12 Apr 00, Doc III-143.

[269]Ibid.

# LIST OF ACRONYMS

ABCS, Army Battlefield Control System
AC, Active Component/Assistant Commandant
ACH, Annual Command History
ACCP, Army Correspondence Course Program
ACR, Armored Cavalry Regiment
ACTD, Advanced Concept Technology Demonstration
ADLP, Army Distance Learning Plan
ADT, Active Duty Training
AECP, Army Experimental Campaign Plan
AFATDS, Advanced Field Artillery Tactical Data System
AG/MPO, Adjutant General/Military Personnel Office
AGR, Active Guard Reserve
AHR, Annual Historical Review
AIT, Advanced Individual Training
ALO, Authorized Level of Organization
ANG, Army National Guard
ARAC, Army Radar Approach Control
ARARNG, Arkansas National Guard
ARNG, Army National Guard
ASARC, Army System Acquisition Review Council
ATACMS, Army Tactical Missile System
ATACS, Advanced Target Acquisition Counterfire System
ATC, Artillery Training Center
ATCAS, Advanced Towed Cannon System
ATCCS, Army Tactical Command and Control System
ATDL, Army Training Digital Library
ATLAS, Advanced Technology Light Artillery System
ATTD, Advanced Technological Transition Demonstration
AWE, Advanced Warfighting Experiment
BAT, Brilliant Antiarmor Submunition
BAT P3I, BAT Preplanned Product Improvement
BCD, Battlefield Coordination Detachment
BFIST, Bradley Fire Support Vehicle
BNCOC, Basic Noncommissioned Officer Course
BRAC, Base Realignment and Closure
CAN, Campus Area Network
CAS3, Combined Arms Services Staff School
CCC, Captain Career Course
C4I, Command, Control, Communications, Computers, and Intelligen
CG, Commanding General
CGSC, Command and General Staff College
CMF, Career Management Field
COB, Command Operating Budget
COLT, Combat Observation Lasing Team
CONUS, Continental United States
CPT PME, Captain Professional Military Education

CSSG, Close Support Study Group
CTC, Combat Training Center
CW, Chief Warrant Officer
DA, Department of the Army
DAB, Defense Acquisition Board
DAC, Deputy Assistant Commandant/Department of the Army Civilian
DACOWITS, Defense Advisory Committee on Women in the Service
DAIG, Department of the Army Inspector General
DARPA, Defense Advanced Research Projects Agency
DAWE, Division Advanced Warfighting Experiment
DCA, Directorate of Community Activities
DCD, Directorate of Combat Developments
DCP, Directorate of Civilian Personnel
DCG, Deputy Commanding General
DEQ, Directorate of Environment Quality
DL, Distance Learning
DOC, Directorate of Contracting
DOD, Department of Defense
DOIM, Directorate of Information Management
DOL, Directorate of Logistics
DPICM, Dual-Improved Conventional Munition
DPTM, Directorate of Plans, Training, and Mobilization
DPW, Directorate of Public Works
DRM, Directorate of Resource Management
DTAC, Digital Training Access Center
DTE, Directorate of Training and Evaluation
DTLOMS, Doctrine, Training, Leader Development, Organization, Materiel, and Soldiers
ECC, Effects Coordination Cell
EMD, Engineering and Manufacturing Development
ER, Extended Range
FA, Field Artillery
FAA, Federal Aviation Administration
FACCC, Field Artillery Captain Career Course
FADAC, Field Artillery Digital Automated Computer
FAOAC, Field Artillery Officer Advance Course
FAOBC, Field Artillery Officer Basic Course
FAPO, Field Artillery Proponency Office
FAS, Field Artillery School
FAST, Future Army Schools Training
FATC, Field Artillery Training Center
FDC, Fire Direction Center
FDSWS, Future Direction Support Weapon System
FDTE, Force Development Test and Evaluation
FECC, Fire Effects Coordination Cell
FF, Firefinder
FIST, Fire Support Team
FISTV, Fire Support Vehicle
FLIR, Forward Looking Infrared
FLOT, Forward Line of Troops
FM, Field Manual

FORSCOM, U.S. Army Forces Command
FOTE, Follow-on Test and Evaluation
FSC, Fire Support Center
FSCAOD, Fire Support and Combined Arms Operations Department
FSCATT, Fire Support Combined Arms Tactical Trainer
FSC3, Fire Support Command, Control, and Communications
FSE, Fire Support Element
FSO, Fire Support Officer
FSTS, Fire Support Training Strategy
FTX, Field Training Exercise
FY, Fiscal Year
GAO, General Accounting Office
GD, Gunnery Department
GIT, Gender-integrated Training
GLPS, Gun Laying Positioning System
GPS, Global Positioning System
GSM, Ground Station Module
GUARDFIST II, Guard Unit Armory Device-Full-Crew Interactiv
G/VLLD, Ground/Vehicular Laser Locator Designator
HCT, Howitzer Crew Trainer
HIMARS, High Mobility Artillery Rocket System
HMMWV, High Mobility Multipurpose Wheeled Vehicle
HQ, Headquarters
HQDA, Headquarters, Department of the Army
HSOT, Howitzer Strap on Trainer
HVAC, Heating, Ventilation, and Air Conditioning
IDT, Inactive Duty
IET, Initial Entry Training
IFCS, Improved Fire Control System
IFSAS, Interim Fire Support Automated System/Initial Fire Support Au
ILMS, Improved Launcher Mechanical System
IOTE, Initial Operational Test and Evaluation
IPDS, Improved Positioning Determining System
JCF AWE, Joint Contingency Force Advanced Warfighting Experiment
JRTC, Joint Readiness Training Center
JSTARS/Joint STARS, Joint Surveillance Target Attack Radar System
LAN, Local Area Network
LLDR, Lightweight Laser Designator Rangefinder
LRIP, Low-rate Initial Production
MACS, Modular Artillery Charge System
MAPS, Modular Azimuth Positioning System
MEDEVAC, Medical Evacuation
MICOM, U.S. Army Missile Command
MLRS, Multiple-Launch Rocket System
MOA, Memorandum of Agreement
MOS, Military Occupational Specialty
NCO, Noncommissioned Officer
NCOA, Noncommissioned Officer Academy
NCOES, Noncommissioned Officer Education System
NEPA, National Environmental Policy Act
NET, New Equipment Training

NETD, New Equipment Training Detachment
NTC, National Training Center
OAC, Officer Advance Course
OBC, Officer Basic Course
OCONUS, outside Continental United States
ODS, Operation Desert Shield/Operation Desert Storm
OMB, Office of Management and Budget
OPMS, Officer Personnel Management System
ORD, Operational Requirements Document
OSD, Office of the Secretary of Defense
OSUT, One Station Unit Training
PCC, Precommand Course
PCS, Permanent Change of Station
PEO, Program Executive Officer
PERSCOM, Personnel Command
PI, Product Improvement
PM, Program Manager
POI, Program of Instruction
POM, Program Objective Memorandum
P3I, Preplanned Product Improvement
RAM, Random Access Memory
RAMS, Rocket and Missile Systems
RATSS, Resource Automated Training Scheduling System
RC, Reserve Component
RFPI, Rapid Force Projection Initiative
RFPI ACTD, Rapid Force Projection Initiative Advanced Concept Technology Demonstration
ROTC, Reserve Officer Training Corps
RSTA, Reconnaissance, Surveillance, and Target Acquisition
SADARM, Sense-and-Destroy Armor Munition
SINCGARS, Single-channel Ground and Airborne Radio System
SJA, Staff Judge Advocate
SME, Subject Matter Expert
SSM, Surface-to-Surface Missile
TACFIRE, Tactical Fire Direction System
TADSS, Training Aids, Devices, Simulators and Simulations
TASS, Total Army School System
TATSS, TRADOC Automated Training Scheduling System
TDA, Tables of Distribution and Allowances
TDY, Temporary Duty
TELS, Transporters, Erectors, and Launchers
TF, Task Force
TNET, Telecommunications Satellite Network
TRADOC, U.S. Army Training and Doctrine Command
TSC, Training Service Center
TSM, TRADOC System Manager
TSSAM, Tri-Service Stand-off Attack Missile
TTP, Tactics, Techniques, and Procedures
USAASA, U.S. Army Aeronautical Services Agency
USACGSC, U.S. Army Command and General Staff College
USAFAC, U.S. Army Field Artillery Center

USAFACFS, U.S. Army Field Artillery Center and Fort Sill
USAFACS, U.S. Army Field Artillery Center and School
USAFAS, U.S. Army Field Artillery School
USAFATC, U.S. Army Field Artillery Training Center
USAG, U.S. Army Garrison
USAR, U.S. Army Reserve
VSEL, Vickers Shipbuilding and Engineering Limited
VTC, Video Training Conference
VTT, Video Teletraining
WIDD, Warfighting Integration and Development Directorate
WOAC, Warrant Officer Advanced Course
WOBC, Warrant Officer Basic Course
WRAP, Warfighting Rapid Acquisition Program
XO, Executive Officer
Y2K, Year 2000
ZBB, Zero Base Budget

STUDENT PRODUCTION FOR FISCAL YEAR 1999

| Course | Initial Input | Graduates |
|---|---|---|
| FA Captain Career Course | 322 | 319 |
| FA Officer Basic Course | 731 | 713 |
| Basic Noncommissioned Officer Courses | 465 | 459 |
| Advanced Noncommissioned Officer Courses | 466 | 463 |
| Primary Leader Development Courses | 720 | 697 |
| Total | 2,705 | 2,651 |
| U.S. Army Field Artillery Training Center (Basic Combat Training, One Station Unit Training, Advanced Individual Training, and U.S. Marines) | 17,264 | 15,794 |
| Grand Total for FY 1999 | 19,929 | 18,445 |

Source: Email msg, subj: FACCC and FAOBC Student Production Statistics for 1999 Annual Command History, 11 Apr 00, Doc III-144; Email msg with atch, subj: Student Production Statistics for FY 1999 for 1999 Annual Command History, 27 Mar 00, Doc III-145; Email msg with atch, subj: Student Production Statistics for FY 1999 for 1999 Annual Command History, 28 Mar 00, Doc III-146.

## APPENDIX TWO
## KEY TRAINING COMMAND PERSONNEL

Commandant and Chief of Field Artillery:
MG Leo J. Baxter, 7 June 97-11 Aug 99
MG Toney Stricklin, 11 Aug 99-present
Assistant Commandant U.S. Army Field Artillery School and Deputy Commanding General-Training:
BG Lawrence R. Adair, 17 Apr 98-13 Aug 99
BG William F. Engel, 5 Oct 99-present
Chief of Staff, Training Command/Commander of the 30th FA Regiment:
Col Theodore J. Janosko, 18 May 98-present
Commander, U.S. Army Field Artillery Training Center:
Col Gerard M. Walsh, 8 Jun 98-present
Noncommissioned Officers Academy:
CSM Gene Odom, Oct 97-21 Jun 99
CSM Ricky L. Hatcher, 21 Jun 99-present
Deputy Assistant Commandant-Futures:
Col Sammy Coffman, Jul 98-Oct 99
Col John A. Yingling, Oct 99-Oct 99
Col Jerry Hill, Nov 99-present
Director, Directorate of Combat Developments:
LTC Russell J. Hall, Jul 98-Jul 99
Col George M. Svitak, Jul 99-present
Director, Depth and Simultaneous Attack Battle Laboratory:
Col Peter S. Corpac, Jul 98-present
Director, Gunnery Department:
Col Thomas G. Waller, Jr., Nov 98-present
Director, Fire Support and Combined Arms Operations Department
Col John A. Yingling, Aug 98-May 99
LTC (P) L. Blum, Aug 99-present
Director, Warfighting Integration and Development Directorat
Col David D. Cutler, Jul 98-Nov 99
Dr Phyllis Robertson, Nov 99-present

## APPENDIX THREE
## KEY USAFACFS PERSONNEL

Commanding General/Commandant of U.S. Army Field Artillery School/Chi

- MG Leo J. Baxter, 7 Jun 97-11 Aug 99
- MG Toney Stricklin, 11 Aug 99-present

Chief of Staff:

- Col David C. White, May 98-May 99
- Col John A. Yingling, May 99-Jul 99
- Col David C. Ralston, 13 Jul 99-present

Deputy Commanding General-National Guard:

- Col D. McCall, 1 Oct 98-present

Base Operations Manager/Deputy Garrison Commander:

- Col D.J. Bonney, 17 Apr 97-10 Jun 99
- Col R. A. Cline, 10 Jun 99-present

Secretary to the General Staff:

- Maj R.P. Smith, Jun 97-Jan 99
- Maj R.M. Pyne, Jan 99-present

Director, Directorate of Community Activities:

- Daniel G. Linehan, Jr., Oct 93-Oct 99
- Randy B. Cone, Jan 00-present

Director, Directorate of Civilian Personnel:

- John D. Kerr, 29 Sep 96-present

Director, Directorate of Information Management:

- J. Parker, Oct 96-Apr 99
- Phyllis Bacon, Apr 99-present

Director, Directorate of Logistics:

- T.S. Haymend, 12 May 96-present

Director, Directorate of Contracting:

- Bernie Valdez, Jan 97-present

Director, Directorate of Resource Management:

- Col Robert L. Hanson, 1 Jun 98-present

Director, Directorate of Public Works

- Col Gary W. Wright, 1 Jun 98-present

Director, Directorate of Environmental Quality:

- T.U. Eldridge, 3 Apr 98-present

Director, Directorate of Plans, Training, and Mobilization:

- Col Herbert G. Brown, 20 Oct 97-1 May 99
- Mitch Pinion (acting), 1 May 99-9 Aug 99
- LTC Britt E. Bray, 9 Aug 99-present

## APPENDIX FOUR
## LIST OF PAST FIELD ARTILLERY SCHOOL COMMANDANTS

CPT Dan T. Moore, l9 Jul l9ll-l5 Sep l9l4
LTC Edward F. McGlachlin, Jr., l5 Sep l9l4-26 Jun l9l6
School was closed 26 June 1916-27 July 1917
COL William J. Snow, 27 Jul l9l7-26 Sep l9l7
BG Adrian S. Fleming, 26 Sep l9l7-ll May l9l8
BG Laurin L. Lawson, ll May l9l8-l8 Dec l9l8
BG Dennis H. Currie, 24 Dec l9l8-l0 Jun l9l9
BG Edward T. Donnely, 30 Jun l9l9-9 Jul l9l9
MG Ernest Hinds, 25 Oct l9l9-l Jul l923
MG George LeR. Irwin, l Jul l923-l Apr l928

BG Dwight E. Aultman, 6 Apr l928-l2 Dec l929
BG William Cruikshank, 8 Feb l930-3l Jul l934
MG Henry W. Butner, l7 Sep l934-l0 Mar l936
BG Augustine McIntyre, 29 Jun l936-3l Jul l940
BG Donald C. Cubbison, l Aug l940-22 Dec l940
BG George R. Allin, 20 Jan l94l-30 Jun l942
BG Jesmond D. Balmer, l Jul l942-ll Jan l944
MG Orlando Ward, l2 Jan l944-30 Oct l944
MG Ralph McT Pennell, 3l Oct l944-30 Aug l945
MG Louis E. Hibbs, 30 Aug l945-4 Jun l946
MG Clift Andrus, 20 Jun l946-15 Apr l949
MG Joseph M. Swing, 9 Apr l949-3l Mar l950
MG Arthur M. Harper, 2 Apr l950-l6 Nov l953
MG Charles E. Hart, 4 Jan l954-28 May l954
MG Edward T. Williams, 8 Jul l954-23 Feb l956
MG Thomas E. de Shazo, l2 Mar 1956-31 Jan 1959
MG Verdi B. Barnes, l5 Feb 1959-25 Mar 196l
MG Lewis S. Griffing, 6 Apr 196l-3l Mar 1964
MG Harry H. Critz, l Apr 1964-l5 May 1967
MG Charles P. Brown, 5 Jul 1967-20 Feb 1970
MG Roderick Wetherill, 24 Feb 1970-3l May 1973
MG David E. Ott, l Jun 1973-24 Sep 1976
MG Donald R. Keith, 9 Oct 1976-2l Oct 1977
MG Jack N. Merritt, 22 Oct 1977-26 Jun 1980
MG Edward A. Dinges, 27 Jun 1980-27 Sep 1982
MG John S. Crosby, 28 Sep 1982-3 Jun 1985
MG Eugene S. Korpal, 4 Jun 1985-17 Aug 1987
MG Raphael J. Hallada, 20 Aug 1987-19 Jul 1991
MG Fred F. Marty, 19 Jul 1991-15 Jun 1993
MG John A. Dubia, 15 Jun 1993-7 Jun 1995
MG Randall L. Rigby 7 Jun 1995-7 Jun 1997
MG Leo J. Baxter, 7 Jun 1997-11 Aug 1999
MG Toney Stricklin, 11 Aug 1999-present

This list represents the most accurate information currently available at Fort Sill. Since World War I, the school commandant has also served as post commander of Fort Sill.

## APPENDIX FIVE
## CHIEFS OF FIELD ARTILLERY

*MG William J. Snow, 15 Feb 1918-19 Dec 1927
*MG Fred T. Austin, 20 Dec 1927-15 Feb 1930
*MG Harry G. Bishop, 10 Mar 1930-9 Mar 1934
*MG Upton Birnie, Jr., 10 Mar 1934-24 Mar 1938
*MG Robert M. Danford, 26 Mar 1938-9 Mar 1942
BG George R. Allin, 20 Jan 1941-31 Jun 1942
BG Jesmond D. Balmer, l Jul l942-ll Jan l944
MG Orlando Ward, l2 Jan l944-30 Oct l944

MG Ralph McT Pennell, 3l Oct l944-30 Aug l945
MG Louis E. Hibbs, 30 Aug l945-4 Jun l946
MG Clift Andrus, 20 Jun l946-15 Apr l949
MG Joseph M. Swing, 9 Apr l949-3l Mar l950
MG Arthur M. Harper, 2 Apr l950-l6 Nov l953
MG Charles E. Hart, 4 Jan l954-28 May l954
MG Edward T. Williams, 8 Jul l954-23 Feb l956
MG Thomas E. de Shazo, l2 Mar 1956-31 Jan 1959
MG Verdi B. Barnes, l5 Feb 1959-25 Mar 196l
MG Lewis S. Griffing, 6 Apr 196l-3l Mar 1964
MG Harry H. Critz, l Apr 1964-l5 May 1967
MG Charles P. Brown, 5 Jul 1967-20 Feb 1970
MG Roderick Wetherill, 24 Feb 1970-3l May 1973
MG David E. Ott, l Jun 1973-24 Sep 1976
MG Donald R. Keith, 9 Oct 1976-2l Oct 1977
MG Jack N. Merritt, 22 Oct 1977-26 Jun 1980
MG Edward A. Dinges, 27 Jun 1980-27 Sep 1982
*MG John S. Crosby, 28 Sep 1982-3 Jun 1985
*MG Eugene S. Korpal, 4 Jun 1985-17 Aug 1987
*MG Raphael J. Hallada, 20 Aug 1987-19 Jul 1991
*MG Fred F. Marty, 19 Jul 1991-15 Jun 1993
*MG John A. Dubia, 15 Jun 1993-7 Jun 1995
*MG Randall L. Rigby 7 Jun 1995-7 Jun 1997
*MG Leo J. Baxter, 7 Jun 1997-11 Aug 1999
*MG Toney Stricklin, 11 Aug 1999-present

*Individuals with an asterisk by their name were officially recognized by the Department of War or Department of the Army as the Chief of Field Artillery. The War Department created the Office of the Chief of Field Artillery on 15 February 1918 to supervise the Field Artillery. On 9 March 1942 the War Department abolished the Office of the Chief of Field Artillery as part of a general wartime reorganization and placed the Field Artillery under the Army Ground Forces. In 1983 the Department of the Army reestablished the Chief of Field Artillery to oversee the development of Field Artillery tactics, doctrine, organization, equipment, and training. Although the War Department and later the Department of the Army did not recognize an official Chief of Field Artillery from 1942 through 1983, the Commandants of the U.S. Army Field Artillery School and its predecessors during those years considered themselves to be the Chief of Field Artillery.

## APPENDIX SIX
## DOCUMENTS

The following documents form the basis of the 1999 Annual Command History, are on file in the Command Historian's Office, U.S. Army Field Artillery Center and Fort Sill, and are available for use upon request.

### CHAPTER ONE

1. "Silhouettes of Steel," Field Artillery, Nov-Dec 99, p. 1.
2. MG Toney Stricklin, "World Fires for the 21st Century," Field Artillery, Jan-Feb 00, p. 1.
3. Official Change of Command and Retirement Ceremony, 11 Aug 99.
4. BG Engel Biography, 7 Jan 00.
5. "Memories, Experiences Will Help AC Direct FA School," Fort Sill Cannoneer, 29 Oct 99, pp. 1a, 2a.
6. Email msg with atch, subj: FY00/01 MPR Program Update, 23 Dec 98.
7. Memorandum for Commanders, TRADOC Installations, subj: TRADOC Resource and Funding Theme, 29 Mar 99.
8. Memorandum for See Distribution, subj: FY00 TRADOC Budget Guidance, undated.
8A. Briefing, subj: TRADOC Commanders Conference, 4 May 99.
9. USAFACFS Mission, Vision, and Installation Priorities, Jun 99.
10. Memorandum for Cdr, TRADOC, subj: Commander's Statement - FY00 Command Operating Budget, 19 Jul 99.
11. Command Operating Budget, 19 Jul 99.
12. Briefing, subj: FY00 Resource Contract, USAFACFS, 15 Sep 99.
13. FY00 Resource Contract, undated.
14. Fort Sill Cannot Do's, undated.
15. Briefing, subj: FY99 Vision Budget, CG Approved Plan, 1998.
16. Memorandum for See Distribution, subj: FY99 Budget Vision Decrements, 9 Apr 98.
17. Memorandum for See Distribution, subj: FY99 Funding Outlook and TRADOC Budget Guidance Response, 10 Sep 98.
18. Memorandum for See Distribution, subj: FY99 Appropriation TRADOC Budget Guidance, 7 Jan 99.
19. Memorandum for See Distribution, subj: FY99 Appropriation TRADOC Budget Guidance, 21 Dec 98.
20. Briefing, subj: FY99 Appropriations TRADOC Budget Guidance, Jan 99.
21. Email msg with atch, subj: Budget Narrative for Annual History, 28 Feb 00.
22. Briefing, subj: FY99 Budget Execution, 31 Mar 99.
23. Briefing, subj: FY99 Budget Execution Mid-Year Review, 27 Apr 99.
24. Briefing, subj: FY99 Budget Execution, 30 Jun 99.
25. Memorandum for Cdr, TRADOC, subj: Commander's Statement - FY99 Appropriation TRADOC Budget Guidance, 10 Feb 99.
25A. U.S. Army Posture Statement Fiscal Year 2001 (Extract), Feb 00.
26. Memorandum for Command Historian, subj: USAFACFS

Annual Command History for CY 1999, 20 Jan 00.

26A.Memorandum for Command Historian, subj: Coordination of 1999 Annual Command History, 31 Mar 00.

27. Interview, Dastrup with Wynona Morris, DRM, 7 Jan 00.

28. Email msg with atch, subj: A76 Studies, 22 Feb 00.

29. Email msg with atch, subj: A76 Studies and Contracting Out, 9 Feb 00.

30. Statement Posture of U.S. Army (Extract), FY2000, Feb 99.

31. Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00.

32. "Steel Rain Returns," Fort Sill Cannoneer, 15 Jul 99, pp. 1a, 8a.

33. "Soldiers Return from Kuwait in Time for Holidays," Fort Sill Cannoneer, 6 Jan 00, pp. 1a and 2a.

34. Interview, Dastrup with Mitch Pinion, Dep Dir, DPTM, 7 Jan 00.

35. Memorandum of Agreement between FAA and the Department of the Army, 23 Mar 99 and 30 Mar 99.

36. Modification to Interagency Agreement between FAA and U.S. Army/Fort Sill, 5 Nov 99.

37. Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00.

38. Interview, Dastrup with Randy C. Palmer, Airfield Operations Officer, DPTM, 7 Jan 00.

39. Email msg, subj: 82nd Medevac Company/Fort Sill Maintenance Contract, 9 Sep 99.

40. Email msg, subj: 82nd Medevac Maintenance Information, 10 Jan 00.

41. Email msg, subj: Medevac Company Maintenance Contract, 7 Feb 00.

42. Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00.

43. Memorandum for Directorate of Contracting, subj: DABT 39-98-C-4018 Aircraft Maintenance, 27 Jul 99.

44. Interview, Dastrup with Mitch Pinion, Dep Dir, DPTM, 7 Jan 00.

45. Memorandum for Command Historian, USAFACFS, subj: DPTM Annual History, 10 Feb 00.

46. Email msg with atch, subj: Project Millennium, 23 Feb 00.

47. Fact Sheet, subj: Army Museum of the Southwest, undated.

48. Briefing, subj: Fort Sill and Y2K, 13 Oct 99.

48A.Email msg, subj: Upcoming Items, 8 Sep 99.

49. Memorandum for Cdrs, TRADOC Installations, subj: Installation-Level Y2K Planning, 15 Oct 99.

50. "City Leaders Invite All to Meetings," Fort Sill Cannoneer, 14 Oct 99, pp. 1a, 2a.

51. Email msg, subj: Y2K Information Paper, 27 Oct 99.

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## DIVISION ARTILLERY STAFF TRAINER

In 1996 the Unit Training Division, Warfighting Integration and Development Directorate (WIDD), U.S. Army Field Artillery School (USAFAS) pointed out that the future battlefield would be different from current battlefields.

Modern weaponry, brilliant munitions, and the high cost of fielding large armies would create widely dispersed battlefields. Operations would be more fast paced and more lethal than in the 1990s, while vast amounts of information produced by advanced technology, especially digitization, would be generated from many sources. In view of this, the Commandant of the Field Artillery School, Major General Randall L. Rigby, said, "Digitization of the force will require us to rethink the way we train the FA soldier and his commanders and staffs -- our frame of reference will have to shift."[270]

To meet the challenges the methods of training division artillery staffs had to change. Upon becoming the Assistant Commandant of the Field Artillery School, Brigadier General William J. Lennox, Jr., launched an initiative to improve such training. Because the division artillery staff had to interact with the division staff and subordinate field artillery units, training was difficult. Traditionally, training took place in division training exercises where the entire division staff and division artillery staff could respond to different tactical scenarios, share information, and pass orders. Although this method proved to be expensive, the lack of training time and personnel tempo provided the rationale for failing to conduct planned division command post exercises. General Lennox saw advanced technology in the form of simulations as a solution.[271]

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[270]1996 USAFACFS ACH, pp. 67-68.

[271]Ibid., p. 68; 1997 USAFACFS ACH, pp. 39-40.

In view of this, the Unit Training Division started a study in 1996 to determine the requirements for an automated division staff trainer that would use simulations to exercise the division artillery staff and the fire support elements from the division's main and tactical command post in key staff functions. During the year, the division worked to define staff training requirements and current training deficiencies and to determine the feasibility of training a division artillery staff in three training environments -- live, virtual, and constructive.[272]

Based upon that study that was completed early in 1997, a team headed by the Depth and Simultaneous Attack Battle Laboratory in the Field Artillery School conducted a concept experimentation program called the Division Artillery Staff Training Driver. As planned, the program would test the integration of automation, simulation, and digital operations for training division artillery staffs. Using a mission scenario and time-ordered events list, the experimentation team would transmit fire missions, message traffic, and unit movement data from the Digital Systems Test and Training Simulator (DSTATS) or the Fire Support Automated Test System (FSATS) to division artillery tactical operations center's (TOC) command and control systems during a command post exercise (CPX). Specifically, the DSTATS would stimulate the Initial Fire Support Automated System (IFSAS), and the FSATS would activate the Advanced Field Artillery Data System (AFATDS). To further replicate tactical scenarios the experimentation team would even send voice communications to the division artillery tactical operations center and the division's fire support elements. Staff performance would then be measured against expected standards developed for each event.[273]

Employing the results of the tests of the drivers of October 1997 and January 1998, the Field Artillery School intended to develop requirements for an exportable, easy-to-use, digital trainer driver for field artillery units. The system would allow a field artillery staff to conduct realistic, high fidelity sustainment training using their own command and control equipment without any additional outside resources.[274]

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[272] 1996 USAFACFS ACH, pp. 68-69; 1997 USAFACFS ACH, p. 40.

[273] 1997 USAFACFS ACH, p. 40.

[274] 1997 USAFACFS ACH, p. 41.