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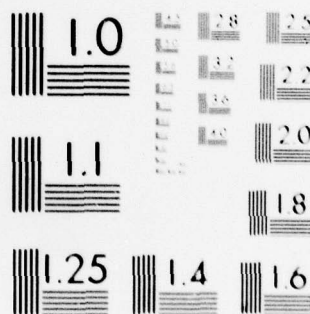4.0   2.0

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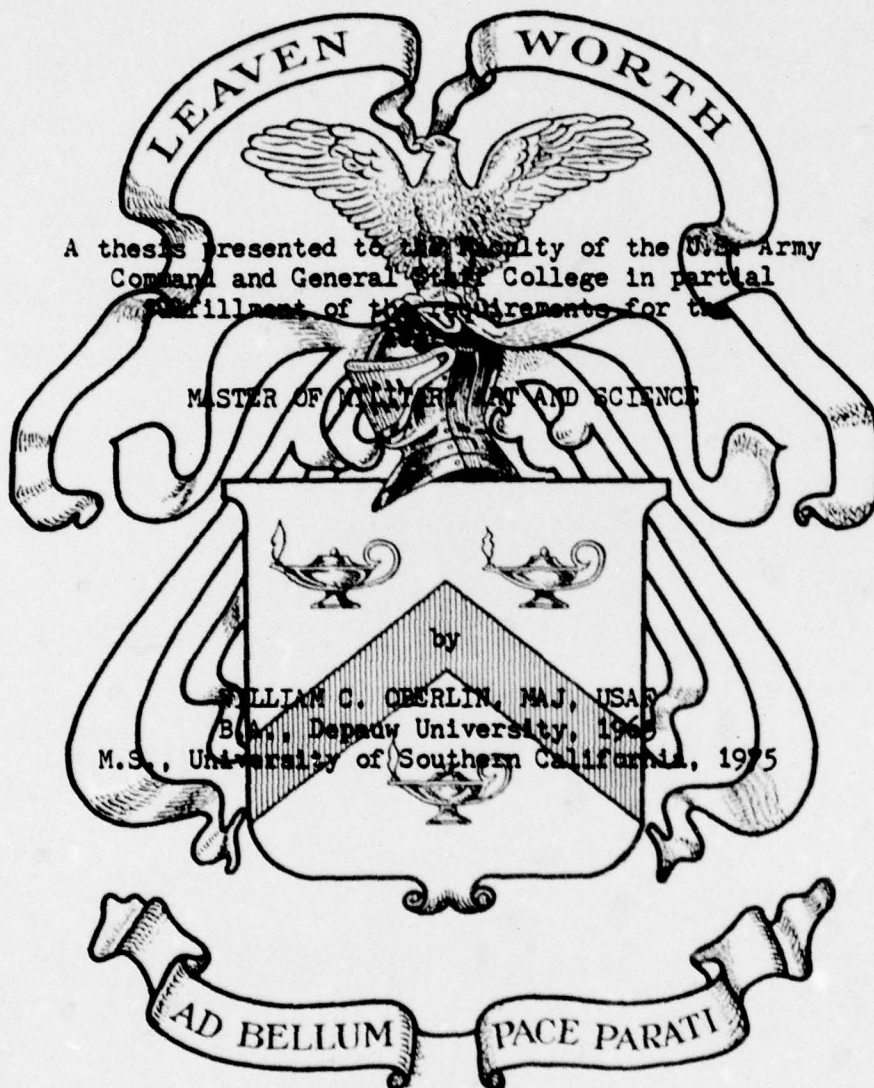
Analysis of USAF Close Air Support Training

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U.S. Army Command and General Staff College
Fort Leavenworth, Kansas 66027

Final Report 8 June 1979

ANALYSIS OF USAF CLOSE AIR SUPPORT TRAINING

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the

MASTER OF MILITARY ART AND SCIENCE

by

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The opinions and conclusions expressed herein are those of the
individual student author and do not necessarily represent the
views of either the U.S. Army Command and General Staff College
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should include the foregoing statement.)

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CHAPTER I

INTRODUCTION

The U.S. Army's primary objective is to win the land battle.
To accomplish this mission requires a combined arms team principally
composed of armor and mechanized infantry supported by field artillery,
air defense, attack helicopters, combat engineers and U.S. Air Force
tactical fighter forces. To this end, the Air Force provides the Army
with five support functions: tactical air reconnaissance, counter air,
interdiction, tactical airlift and close air support (CAS). This last
function directly impacts upon the ground commander's fire and maneuver
capability because tactical air support can be integrated into the ground
force's organic fire plan. Army Field Manual (FM) 100-5 Operations
states, ".....U.S. Army commanders must recognize that battlefield
success is dependent to a major degree upon U.S. Air Force, U.S. Navy
or Marine Corps support....Teamwork in joint and combined operations
is integral to readiness for land combat."[1]

The Joint Chiefs of Staff define close air support as: "air
attacks against hostile targets which are in close proximity to friendly
forces and which require detailed integration of each air mission with
the fire and movement of those forces."[2] The Army is more definitive

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[1]Department of the Army, Operations, FM 100-5 (29 April 1977), p. 1-5.

[2]Department of Defense, Joint Chiefs of Staff, Dictionary of
Military and Associated Terms, Pub 1 (3 September 1974), p. 68.

1

in its treatment of what constitutes "close". FM 6-20, <u>Fire</u> <u>Support</u> <u>in</u> <u>Combined</u> <u>Arms</u> <u>Operations</u> states: "For planning convenience, CAS is normally planned short of the FSCL (Fire Support Coordination Line) and air interdiction is planned beyond the FSCL."[3]

The National Security Act of 1947 gave the Air Force the responsibility of providing close air support for ground forces. The Joint Chiefs of Staff Publication 2 further refines the responsibility to include: doctrine, procedures, equipment, tactics, techniques and unit training of forces.[4]

The close air support mission in the Air Force is performed by the tactical air forces (TAF) assigned to Tactical Air Command (TAC), U.S. Air Forces in Europe (USAFE), Pacific Air Forces (PACAF) and the Alaskan Air Command. While training responsibility rests with all commands, TAC is responsibile for the initial training of personnel enroute to the overseas tactical air forces, in addition to the initial and continuation training of its own forces. Consequently, TAC has primary tactical fighter training responsibility.

Initial tactical flying training is accomplished as outlined in TAC syllabuses of instruction for each type weapon system, eg. A-7D, A-10, F-4. Continuation flying training is governed by TAC Manual (TACM) 51-50.[5] Close air support training is included in the continuation

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[3] Department of the Army, <u>Fire</u> <u>Support</u> <u>in</u> <u>Combined</u> <u>Arms</u> <u>Operations</u>. FM 6-20 (30 September 1977), p. D-5.

[4] Department of Defense, Joint Chiefs of Staff, <u>Unified</u> <u>Action</u> <u>Armed</u> <u>Forces</u> (<u>UNAAF</u>) (<u>FOUO</u>), Pub 2 (October 1974), p. 33.

[5] TACM 51-50 is a multi-command manual: PACAF, USAFE, Alaskan Air Command.

training programs of those weapon systems assigned the close air

support role, ie. A-7D, A-10 and the F-4.

THE MODERN BATTLEFIELD

Army FM 100-5 addresses the new lethality found on the modern

battlefield:

> Today's battlefield presents challenges beyond any the US
> Army has ever faced. Great numbers of weapons of advance
> destructiveness have been provided by major powers to client
> states; arms purchased by minor but affluent nations have
> further spread the latest military technology throughout the
> world. Recent wars between small nations have developed in-
> tensities formerly considered within the capabilities of
> large states only.[6]

The 1973 Yom Kippur War had a devastating impact on the previously

successful Israeli armor and air support combined arms team. First,

the introduction by Egypt and Syria of sophisticated air defense weapon

systems (Soviet SA-2, SA-3, SA-6 and SA-7 missiles coordinated with

air defense artillery), resulted in extensive losses of Israeli Air

Force (IAF) aircraft which denied the Israeli Defense Force (IDF) the

long range fire power associated with its traditional armor thrusts.

The IAF was not able to provide effective support to the ground battles

until the air defense "umbrellas" were destroyed. Similarly, the intro-

duction of large numbers of Soviet made RPG-7 and Sagger "suitcase"

missile anti-armor weapons by Egyptian infantry severely blunted Israeli

armor frontal attacks. The resulting battles accounted for unprecedented

armor losses on both sides and highlighted the futility of relying upon

the single weapon system or combat arm. A commander cannot expect to

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[6] FM 100-5, p. 2-1

win on the modern battlefield without a combined arms team of armor, infantry, artillery and tactical air.

Undoubtedly, the most serious threat today would be encountered on the Central European battlefield in a Warsaw Pact - NATO confrontation. The implications of the 1973 War Combined with the known Soviet strength and doctrine clearly indicate a future European conflict would be of immense and unprecedented violence:

> ....the first battle of the next war could well be its last battle: belligerents could be quickly exhausted, and international pressures to stop fighting could bring about an early cessation of hostilities. The United States could find itself in a short, intense war - the outcome of which may be dictated by the results of the initial combat. This circumstance is unprecedented: we are an Army historically unprepared for its first battle. We are accustomed to a victory wrought with the weight of material and population brought to bear after the onset of hostilities. Today the US Army must, above all else, prepare to win the first battle of the next war.[7]

The lethality, tempo and magnitude of the modern battlefield place added constraints and requirements on close air support. The procedures and techniques developed in the low intensity Vietnam era are inapplicable to the modern high intensity battle. The roles and responsibilities of the major participants, the forward air controller (FAC), the fighter pilot, and the ground force commander, have all changed.

The FAC can no longer orbit over the target with impunity and carefully identify targets. The fighter pilot can no longer plan to conduct his mission at medium altitude to avoid small arms and provide the optimum visual acuity for target identification and ordnance delivery parameters. And finally, the ground force commander can no longer

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[7]Ibid., p. 1-1.

consider tactical air support simply an extraordinary or emergency fire support source.

The modern high intensity battlefield will force FAC's back behind the forward edge of the battlefield (FEBA); it will require fighter aircraft to ingress to a target area at very low altitude to avoid the lethal air defense threat; and finally, the modern battlefield will require ground force commanders to carefully integrate tactical air support into their overall battle plan for fire and maneuver. Therefore, the lethality, magnitude and tempo of modern battle necessitate a high degree of coordination between participating elements.

Similarly, the degree of difficulty has also risen. "The Air Force will provide close air support, wherein tactical fighter aircraft attack targets designated by the ground commander. Close air support is increasingly difficult, but when the engaged Army forces require close air support to accomplish their mission, it must be provided regardless of difficulty and regardless of cost."[8]

The tactical air forces must be prepared to provide the "increasingly difficult" close air support. To do this they must train, and train as realistically as possible.

> Given the complex and important interaction between air and
> land forces, the requirement for cooperation and teamwork
> is very great. Because the Army and Air Force are separate
> services which come together on the field of battle under joint
> commanders, the requirement for an air-ground communications
> system and an agreed employment concept (followed by joint
> training in operations proceedures and frequent exercises) is
> absolutely essential.

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[8] Ibid., p. 8-2.

[9] Ibid., p. 8-2.

Given the changing nature of the modern high intensity battle-
field and the concomitant increased difficulty and complexity of modern
close air support, the Air Force's close air support training programs
must be preparing pilots to fight in this environment. Tactical Air
Command implemented its present tactical flying training program
command-wide on 1 October 1977. The program introduced a new concept
called Graduated Combat Capability (GCC). The concept allows units to
maintain a prioritized combat capability. If circumstances preclude a
total utilization of resources, then a unit would temporarily eliminate
certain combat tasking and concentrate on training for a certain priority
mission or combination of missions. Commanders are also given the
latitude to tailor training programs based upon individual requirements
and unit capabilities. The GCC training scenarios stress realism and
combined force (air), high intensity operations. The original program
of 1 October 1977 has subsequently been modified. The new program as
outlined in TACM 51-50 (Draft/Working copy as of this writing) is
essentially the same as the old program except less structured and less
susceptible to unit sortie production turbulence.

PURPOSE OF THE STUDY

The purpose of this study is to determine whether or not the
present TACM 51-50 GCC program is effectively training pilots to con-
duct close air support on the modern high intensity battlefield.

--Do the requirements outlined in the TACM 51-50 training
programs reflect the requirements necessary to perform close air
support on the modern battlefield?

--Are units able to accomplish the training requirements and achieve the necessary close air support proficiency levels?

HYPOTHESES

This author has formulated two hypotheses based upon personal observation and experience:

--Hypothesis 1: The current TACM 51-50 flying training programs are based upon a modern high intensity battlefield scenario, but they do not adequately recognize the increased difficulty in performing the close air support mission as an integrated member of the combined arms team. Therefore, the training programs do not reflect adequate emphasis on joint training programs.

--Hypothesis 2: Units are accomplishing the TACM 51-50 close air support training but are not achieving close air support proficiency levels because they lack emphasis on joint training programs.

LIMITATIONS

This study addresses only day close air support continuation training. Initial training is important; however, continuation training programs mirror initial training programs and are a better indication of combat capability since initial programs are by necessity very rudimentary. Night close air support training is also a very important facet of the air support mission, but it has received little emphasis in the past. Nevertheless, recent professional works have highlighted deficiencies in the night close air support mission and have recommended solutions. Major Johnny M. Jones' thesis, "USAF Training for Night

Close Air Support" is a very good analysis of the problem.[10] Also, for reasons of the time and availability of research material, this study is confined to the principal USAF close air support weapon systems - the A-7D and the A-10. Furthermore, only active duty Air Force training programs will be addressed. Lastly, this study is unclassified for widest dissemination.

ASSUMPTIONS

This study assumes the USAF will continue to have primary responsibility for close air support of ground forces and that the current philosophy of integrated combat operations will continue to be a viable planning element.

METHODOLOGY

Chapter II presents a historical review of close air support culminating in an examination of the close air support skills and knowledge requirements necessary on today's battlefield. Chapter III is a description of the current close air support training programs. Chapter IV is a comparison of the close air support skill and knowledge requirements determined in Chapter II with the requirements actually in the current close air support training program, as determined in Chapter III. Chapter V continues an analysis of the factors affecting a unit's ability to accomplish the training programs.

Chapter VI restates the hypotheses and tests them against the evidence presented in Chapter IV and V. Conclusions are drawn and recommendations are presented based upon the study findings.

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[10] Johnny M. Jones, "USAF Training for Night Close Air Support" (MMAS thesis, U.S. Army Command and General Staff College, June 1978).

CHAPTER II

CLOSE AIR SUPPORT

HISTORICAL PERSPECTIVE

Close air support had its beginnings in World War I, as did all
forms of tactical and strategic aviation. In fact, by 1916 on the Somme
virtually every future tactical use of the airplane had been operation-
ally exploited. The aircraft's first function was reconnaissance; however,
the reconnaissance aircraft soon needed protection from other aircraft.
Machine guns were mounted, and aerial warfare began. Nevertheless,
"the spectacular mass dogfights of the air war were less significant
than the mundane activities of larger numbers of aircraft used more
closely with ground operations. In the last two years of the war, these
activities were extended to support of infantry and tanks, and to the
ground strafing of enemy rear areas, particularly in the Battle of Amiens
(1918)."[1] In fact, the strategic air bombing and deep interdiction began
as a tactical operation in support of ground forces.

Unfortunately, the revolutionary zeal of World War I did not
carry over into the inter-war years of 1919-1941 for American military
aviation. Men such as Mitchell and Douhet believed air power to be the
key to modern warfare, but few agreed. Consequently, the U.S. entered
World War II with an insufficient air force and little training in the
use of air power, especially close air support. Our initial performance
in North Africa bordered on disaster. General McNair quipped, "It is

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[1]Richard A Preston and Sydney F. Wise, Men in Arms, A History of
Warfare, (New York: Praeger Publisher, 1970), p. 268.

9

absolutely true that the air helped less than in World War I - this in spite of the fact that the German air had been driven from the skies."[2] At Kasserin Pass, the air support was totally ineffective. There was no centralized control of the limited air asset and only a weak air-to-ground control system. General Bradley remarked, "We can't get the stuff when its needed, and we're catching hell for it. By the time our request for air support goes through channels, the target's gone or the Stukas have come instead."[3] Fortunately, the situation improved by the Italian campaigns, and the control system became more established and responsive. Patton commented as Commanding General of the 3rd Army, "Even if von Runstedt continued to push his famished columns toward the Meuse, he could no longer support the offensive as long as we could pound him from the air."[4] However, it should be realized that only approximately 15 of all air sorties were close air support sorties. The vast majority were strategic bombardment or tactical interdiction.

The post-war period was again lean for tactical air forces. In fact, Tactical Air Command lost all of its aircraft and became a planning agency. The beginning of the Korean War say a failure indicative of the American military system; we forgot the lessons learned from the last war. The command, control and communications system (c^3) had to be "reinvented." Many Army officers were highly critical of USAF close air support and wanted a system similar to the Marine Corps system. General Ridgeway remarked, "Requests for air strikes continued

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[2] Department of the Army, HQ CONARC Close Air Support History (U), (29 August 1963), p. 19.

[3] Ibid., TAB C.

[4] Ibid., TAB C.

to follow the old merry-go-round, up through channels to Army, then to Air Force, and down again.. Frequently, as a result of this time consuming procedure, when the planes got there the enemy had gone."[4] Fortunately, "the wheel was finally reinvented," and close air support became effective and responsive in Korea. The only continuing complaint was that most USAF aircraft could not carry enough ordnance or stay in the target area long enough for protracted, heavy combat.

The application of air power in Vietnam was both massive and innovative. An elaborated C^3 system was established. Aircraft were specially designed for the close air support role. Transports were turned into gunships; World War II and Korean War vintage aircraft were refurbished and sent back into combat. New munitions such as anti-personnel cluster bomb units (CBU) were designed and dropped from huge B-52 bombers operating in a ground support role. Since the strategic role was virtually eliminated, and the intensity and location of interdiction varied with the political climate, Vietnam close air support was the high priority mission, contrary to previous experiences.[5]

Nevertheless, all four air wars had much in common. All were fought in a relatively permissive environment. World War I was a heavily contested air war, but the weapons lacked lethality and range. World War II was also a heavily contested air war; but in close air support, the U.S. normally had at least temporary air superiority, and

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[4] Ibid., p. 48.

[5] Withdrawl of American troops placed the air power emphasis on interdiction.

the Axis front line air defenses were weak. Korea was a repetition
of World War II with jet aircraft. Vietnam again saw low lethality air
defense weapons in an air superiority environment. Therefore, the U.S.
has never really been faced with the problem of trying to provide close
air support in a high threat environment. Interestingly enough, however,
history indicates that lack of opposition did not facilitate an effec-
tive close air support system. To the contrary, close air support has
proven to be very difficult, even in non-high threat environments.

MODERN BATTLEFIELD

Today's battlefield is characterized by tremendous lethality,
complexity and violence. To ascertain specific close air support
requirements, it is necessary to study the war in which it may be em-
ployed. Defense Department planners presently visualize the Soviet
Union as the single greatest threat to the United States. Similarly,
Europe is the most challenging locale for the next war.[6] This is not
to say that the next war will be fought in Europe between NATO and the
Warsaw Pact, it is only to say that this is today's most dangerous con-
tingency. Other scenarios may be more plausible, eg. a Middle East
conflict resulting in American intervention to prevent the shutoff of
petroleum. However, preparation for the most difficult battle may
demand a higher state of readiness than preparation for the most likely
battle, if the latter is even possible. For the purposes of this study
the modern battlefield will be referred to as the "central battle," a

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[6]Department of Defense, Annual Report Fiscal Year 1979,
Harold Brown, Secretary of Defense, (2 February 1978), p. 78.

term defining "the critical place on any battlefield where all aspects of the air-land battle: firepower, maneuver and support come together to bring about a decision."[7] The importance of the central battle, or central battle of the first battle, has already been addressed. A review of the Soviet offensive doctrine is helpful in gaining a better appreciation for the magnitude of the central battle.

First, the modern Soviet Army in the offense stresses maneuverability, firepower, breakthrough, pursuit and total destruction of the enemy. A typical scenario might begin early on a winter morning following Soviet troop "training" maneuvers along the international border. There is much conjecture as to how much advance warning will be available, but probably the warning will vary from 48 hours to ten days. The weather will be wet and cold with limited visibility. Ceilings will be less than 2000 ft. almost 50% of the time.[8] The attack will appear to be across a broad front with Soviet Combined Arms Armies (CAA) echeloned for the attack and moving in march formation. Initial contact will take place in the covering force area, or that area in front of the main battle area where covering force units are tasked to determine enemy strength, force him to deploy prematurely and then delay him as long as possible.

In the main battle area behind the covering force area current U.S. tactical doctrine calls for employment of the "active" defense.

[7]Donn A. Starry, "Focus Is Central Battle," Army, October 1978, p. 30.

[8]Charles Kamp, Jr. "The Next War: Modern Conflict in Europe," Strategy and Tactics, July/August 1969, p. 16.

In response to the active defense, the Soviet forces have designed a counter-tactic to strip away the protective area. The tactic employs reinforced motorized rifle regiments of the army's second echelon in front of first echelon troops (Figure 2-1).[9] Col. A.A. Sidorenko of the Soviet Army defines the mission of these troops: "destroy enemy covering forces, clean the path for their main body for unhindered advance to the main line of defense, and create favorable conditions for their deployment and commitment to combat. The actions of the troops must be bold, decisive, full of initiative, and calculated for the rapid destruction of the enemy. The basis for their offensive actions is a bold maneuver executed to attack the flank and rear of strong points in combination with an attack by a portion of the forces from the front."[10]

As the echelons of the Soviet motorized rifle division approach the forward edge of the battle area (FEBA), normally in two motorized rifle regiments abreast, the formation will narrow to a 4-7km zone for the actual attack breakthrough. The actions at the breakthrough point will be characterized by intense artillery bombardment and heavy concentrations of tanks and armored personnel carriers (BMP's). Soviet aviation will be simultaneously striking deep to the rear at reserve, command and control center and logistics areas. Also, the Soviets will

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[9] Floyd V. Churchill, "To Win the First Battle," Military Review, November 1978, p. 64.

[10] A.A. Sidorenko, The Offensive, (Translated and Published Under the auspices of the U.S. Air Force, 1970), p. 140.
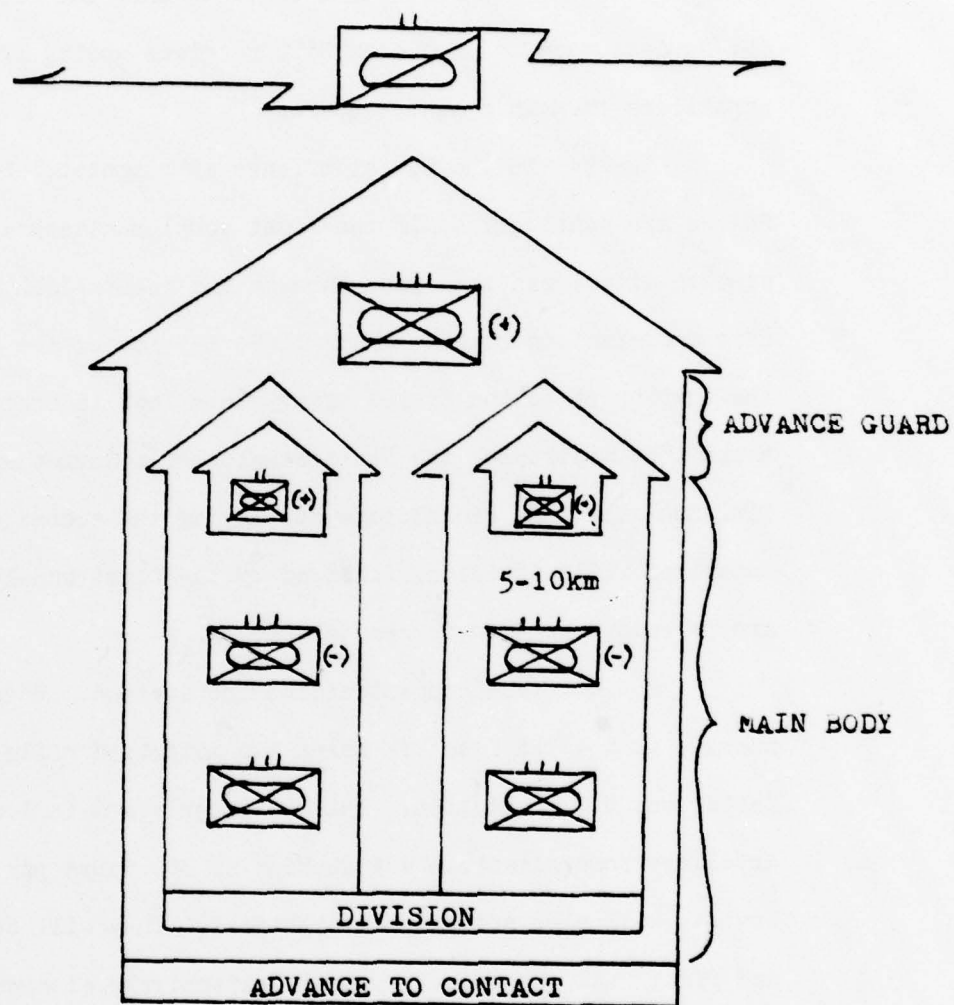
FIGURE 2-1   SOVIET ADVANCE TO CONTACT

employ air assault operations within division and corps rear areas to seize key areas and block escape routes.[11]

Once the breakthrough has been achieved, the attacking force will return to march column and continue into the enemy's rear area. The Soviets hope to encounter NATO reserves moving forward and annihilate them in a hasty attack.

The key to the Soviet offense is momentum. For this reason the forces are echeloned so if the first echelon attack stalls, the second echelon attack can then pass through and reestablish momentum. It is also important to realize that all Soviet forces are echeloned from the company up to the Soviet Army. This fact is critical because it means that destroying the first echelon of a Soviet motorized rifle division will then necessitate destroying the second echelon of the motorized rifle division, followed by the first echelon of the Soviet Army's second echelon forces, and so on.

Soviet force concentrations are awesome. When a Soviet division narrows to a 4-7km front it means two motorized rifle regiments may be facing one U.S. battalion. This is roughly a 6 to 1 confrontation. Artillery concentrations are as high as 300 tubes per kilometer. The Soviets will also not stop at nightfall. They will continue to fight, and fight well, because they train extensively at night. Finally, the Soviets use nuclear weapons as an integral part of their offensive operation and not as a "last ditch" effort. Sidorenko states, "Nuclear weapons are the most powerful means for the mass destruction of troops and rear area objectives. Among all other means of combat, they possess

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[11]Churchill, _First Battle_, p. 65.

the greatest force for physical and moral-psychological influence and therefore they have decisive influence on the nature of the offensive."[12] The fact that the Soviets are now pressurizing their tanks and training under simulated nuclear, chemical and biological (NBC) warfare conditions indicate the Soviets are prepared to employ and operate in an NBC environment.

The air war is just as violent as the ground battle. The Soviets operate with a tactical air army subordinate to the front-level ground force commander. The objectives of the tactical air army are to seize and maintain air superiority, disrupt the communications zone (COMMZ), attack targets in the combat zone in direct support of ground operations (principally command and control, logistics and reserves), conduct tactical air reconnaissance, operate deep into the combat zone with tactical air transport, and jam radar and communications systems. The tactical air army's composition is not precisely fixed, but it will have approximately 3000 aircraft in Central Europe. An air army opposing a U.S. corps will probably produce 300-500 fighter bomber sorties per day ranging as far as 200km deep, and 75-150 heavy bomber sorties per day. Of primary concern to the Soviets are the destruction of NATO's nuclear delivery means and gaining air superiority.[13]

Soviet defense protection include the ZSU 23-4 fully tracked, radar assisted anti-aircraft gun, and the SA-4, -6, -7, -8, -9 and -11 surface-to-air missile systems. The SA-4, SA-6 and SA-11 are mounted

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[12]Sidorenko, Offensive, p. 40.

[13]Department of the Army, Larger Unit Operations, FM 100-15 (DRAFT) (14 March 1978), p. 10-3.

on tracked vehicles while the SA-8 and SA-9 are mounted on lightly armored, wheeled, amphibious vehicles. The effectiveness of these weapon systems was demonstrated in the Arab-Israeli October 1973 War. General Herzog stated that the Israeli ground commander stopped requesting sorely needed close air support because they were "appalled at aircraft losses when Israeli pilots with consummate bravery pressed home their attacks despite the density and lethality of the air defense weapons."[14] On the Golan Heights, commanders were forced to request close air support prior to enemy air defense suppression. The consequences were disasterous. One hundred-two aircraft were lost and only two of those to air-to-air combat.[15] Some of the consequences of the deployment of this highly effective air defense system are:

    1. Enemy ground-based air defense may prevent our
    aircraft from orbiting or loitering over the main
    battle area.

    2. Enemy aircraft may challenge and engage close
    air support missions.

    3. Airborne and forward air controllers may have
    to stand-off from enemy air defenses.

    4. Strike flights will probably come in at low
    altitude, pop-up to attack targets and egress at
    low altitude.[16]

Emanski identifies the problem well when he states:

    Close air support missions in the sense of multiple
    passes by a heavily loaded aircraft responding to
    and directed by a ground or airborne forward air
    controller are not possible unless you have control

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[14] J.J. Emanski, Jr., Continuous Land Combat (SRI Int'l, Technical Report 4940, September 1977), p. 54.

[15] Hans F. Roses, "Defense Suppression Mission or Tactic?" Air University Review, July-August 1978, p. 27.

[16] Emanski, Continuous Combat, p. 52.

of the local airspace; present generation precision guided munitions and stand-off weapons will not restore the situation because of the limited visibility environment and rolling wooded terrain in Europe, and because of the smoke and countermeasures of the Warsaw Pact mechanized forces; shallow glide attacks from a low-NOE approach using the 30mm gun are probably the most survivable types of runs that can be made. However, the aircraft has to close very close to the defended tank company target and is very likely to take hits. Even if the aircraft survives because of its armor and design, battle damage repair will be extensive. The target hand-off problem from the FAC and low level navigation to an exact pull up point is a difficult problem that must be solved even to execute the attack described above. Finally, the enemy is given the night and to a large extent the time that the weather is bad. In the continuous offensive that is projected by the Warsaw Pact, and for which their tank heavy mechanized forces are equipped and configured, this is a big handicap for NATO to yield.[17]

CLOSE AIR SUPPORT REQUIREMENTS

Based upon the central battle, certain close air support skill and knowledge requirements are identifiable and should be the basis for a current close air support training program.

First, working level knowledge of Soviet doctrine and tactics is absolutely necessary.[18] Pilots must be familiar with Soviet attack formations to visualize echelonment, probable combat unit locations, headquarters, artillery and logistics sites.[19] In essence, the USAF close air support pilot must be able to doctrinally "template" the

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[17]Ibid., p. 56.

[18]Frank D. Garza, "Fighter Force Training for European Scenario." (MMAS thesis, U.S. Army Command and General Staff College, May 1977), p. 59.

[19]The term "pilot" will be used to represent both pilots and aircrew members commonly use in conjunction with two place fighter aircraft such as the F-4.

enemy on the terrain. A doctrinal template is a model of enemy force composition, disposition and strength. Some may argue that this is an intelligence function and should be provided by Intelligence personnel. This is true, however on the dynamic battlefield, pilots must be able to rapidly adjust intelligence assessments and draw inferences based upon the existing ground situation.

In many cases missions may be diverted from close air support missions to "battlefield interdiction" missions. This type mission, although not formally recognized as a separate mission since it encompasses both close air support and interdiction requirements, will be vital in the central battle. Battlefield interdiction will consist of destroying the second and subsequent echelons of the enemy. It is, therefore, important for the close air support pilot to know where to find these echelons, their direction of attack, their formation strength and their composition.

Similarly, the close air support pilot must be familiar with current U.S. Army doctrine and tactics. In reference to the central battle, a pilot must understand the active defense. In a fast moving, violent battle against Warsaw Pact forces who believe in by-passing pockets of heavy resistance, there probably will not be a well defined FEBA or forward line of troops (FLOT).

A forward air controller (FAC) in the target area greatly facilitates the close air support mission; however, an airborne FAC (AFAC) in the immediate target area is unlikely considering the lethal enemy air defenses. The more likely possibility is an AFAC behind the FEBA, out of visual range of the target, acting as a relay and

coordination control point. The AFAC will hand the fighters off to a ground FAC (GFAC) who may or may not have visual contact with the target. Most likely he will not actually be looking at the target because of terrain restrictions. He may, however, be located in an Army helicopter. This would provide better visual coverage and control of the battle area. Figures 2-2, 2-3 and 2-4 depict possible FAC arrangements.

Another possibility is no FAC at all. Although this is the least desirable, it may be the most likely. TACM 2-1 states, "If the nature of the threat or tactical situation precludes an airborne FAC from operating, fighters may work directly with a ground FAC and/or forward observer who will provide the details necessary for the strike."[20] Army FM 6-20 states, "The FIST (Fire Support Team) is trained to acquire close air support targets, mark the targets and control CAS attacks when a USAF FAC is not available."[21] Therefore, the Army is prepared to close air support in the absence of a USAF FAC. This places more responsibility on the close air support pilot since Army FIST personnel, although trained in controlling air strikes, are not as proficient as USAF FAC's.

Close air support pilots must be familiar with the limitations and capabilities of Army field artillery (FA) regarding target marking and air defense suppression. For example, if the FIST does not mark

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[20] Department of the Air Force, Tactical Air Command, Tactical Air Operations, TACM 2-1 (Langley Air Force Base, Virginia, 15 April 1978), p. 4-3.

[21] Department of the Army, Fire Support in Combined Arms Operation, FM 6-20 (30 September 1977), p. TAB D-A-1.
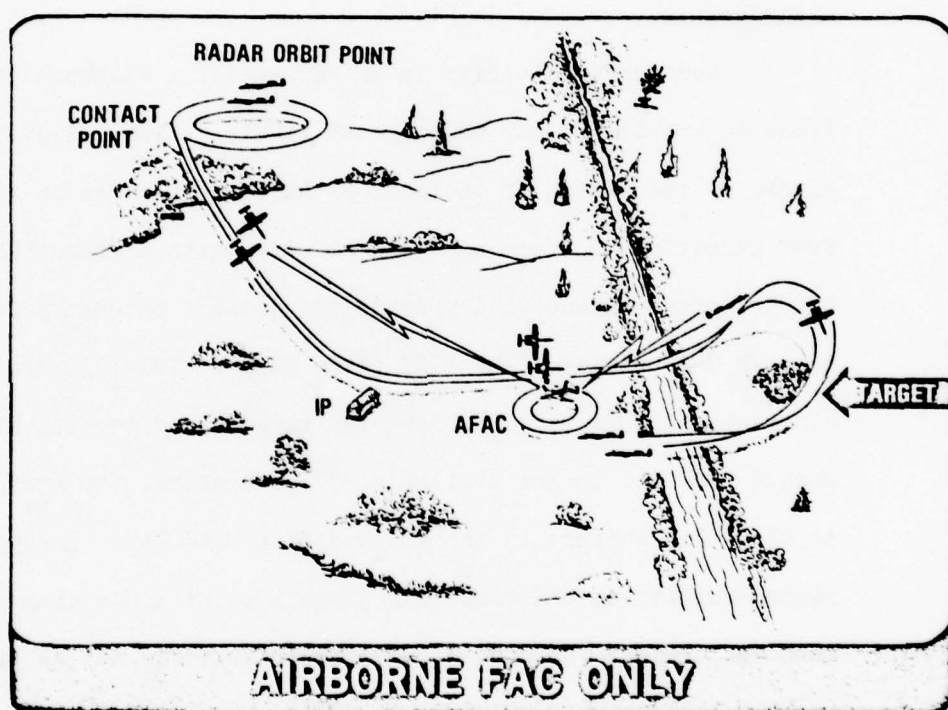
AIRBORNE FAC ONLY

FIGURE 2-2

(Source TACM 2-1)

GROUND FAC ONLY

FIGURE 2-3

(Source TACM 2-1)

RADAR ORBIT POINT

CONTACT POINT

IP

AFAC

GFAC

TARGET

BASIC TEAM CONCEPT
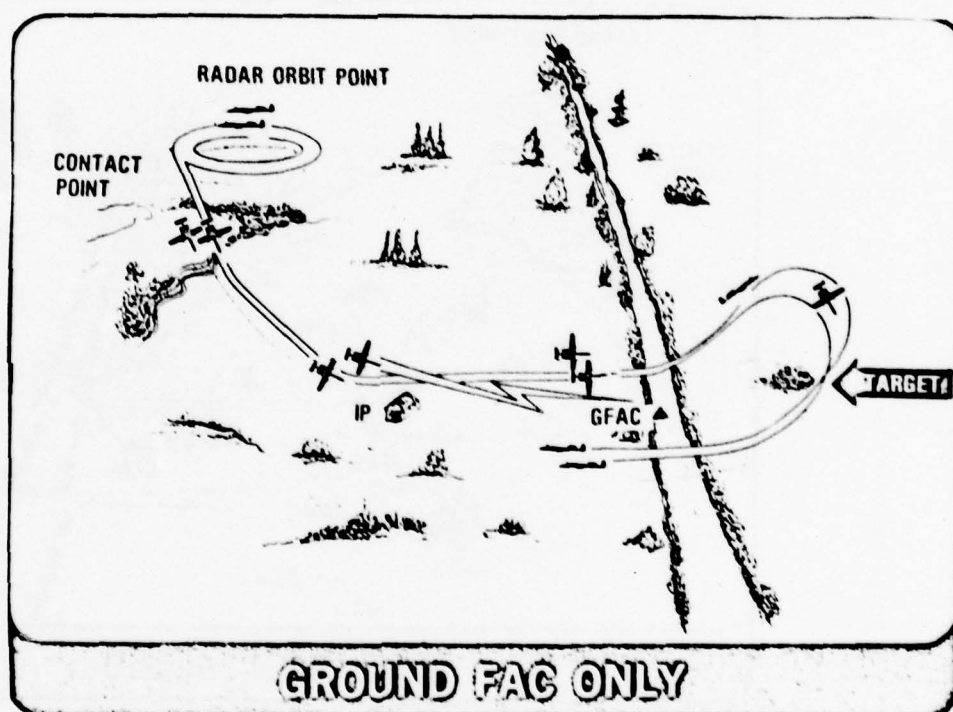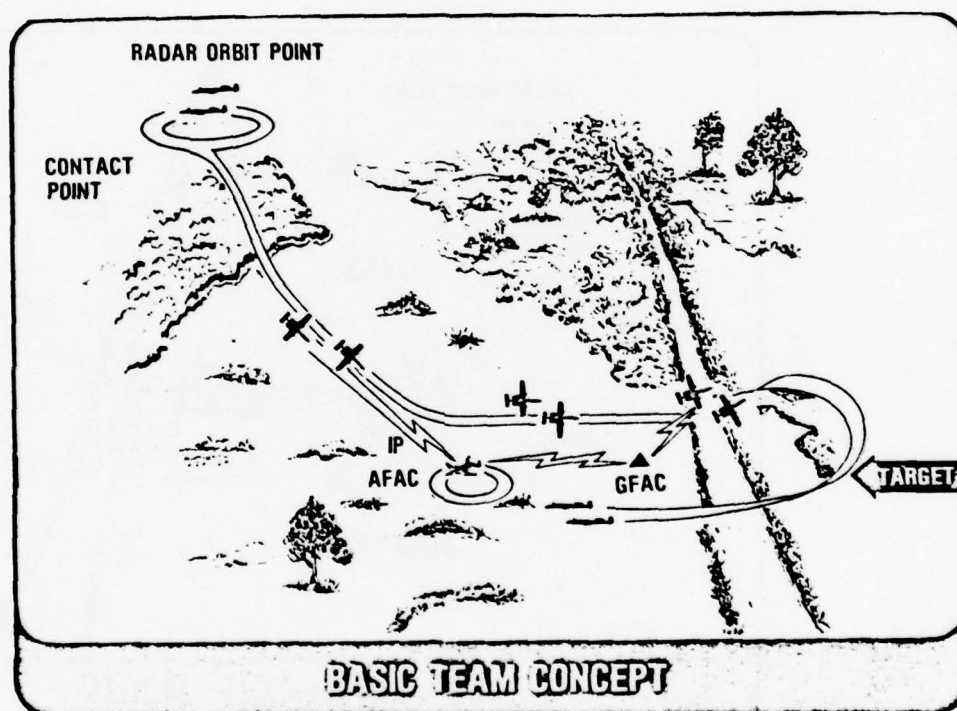
FIGURE 2-4

(Source TACM 2-1)

a target and the pilot is having difficulty visually acquiring the target, the pilot should request FA mark the target or inquire as to whether other marking means are available such as attack helicopters armed with white phosphorous rockets.

A close air support pilot must also be able to quickly distinguish between U.S. and Soviet equipment, especially armor, artillery and APC's, eg. Soviet T-62's versus U.S. M60A1's, Soviet 152SP's versus U.S. 155SP's, Soviet BMP's versus U.S. M113's. The acquisition, distinction and reaction time of the pilot must be compatible with the weapon system delivery parameters, eg. Maverick air-to-ground missile delivery parameters.

Finally, the location of the FAC's or absence thereof, may require pilots to ingress and initiate an attack on a target with less than sufficient information. Consequently, pilots may be forced to quickly analyse the the ground situation from incomplete information within a matter of seconds. Likewise, flight leaders may be required to brief follow-on flights concerning the target and combatant dispositions based upon his brief observation during the attack.

In essence, a close air support pilot must be intimately familiar with U.S. doctrine and tactics, equipment identification, and Army fire support procedures and capabilities. He must also be familiar with Soviet doctrine and tactics if he is to be proficient on the modern battlefield. The bulk of this preparation, however, begins before takeoff.

Close air support planning considerations do not really differ from any other tactical mission planning requirements. The planning must be thorough and encompass all actions from initial flight planning through

engine shutdown. The old flying adage "plan your flight and fly your plan" applies. However, special attention must be given to munitions capabilities and command and control procedures. Munitions capabilities must be known to employ the weapons with optimum effectiveness. Furthermore, knowledge of munitions capabilities will aid in contingencies such as an inflight divert from a preplanned target to an immediate tactical emergency or a weather alternate target.

Command, control and communications (C^3) of the central battle will be exceptionally difficult, but crucial. A typical mission profile will be to contact, after takeoff, control elements of the Tactical Air Control System (TACS) which may include the Airborne Command and Control (ABCCC) and the Airborne Warning and Control System (AWACS) Figure 2-5. Pilots will be radar vectored to rendezvous points where updated strike information, target area weather and FAC call signs and frequencies will be provided over secure radio. Later, at some predetermined forward rendezvous or holding point, the close air support flights will contact an airborne, ground or some other controlling agency.[22] All of these control proceedures must be well understood, along with emergency control and passage procedures.

The central battle will probably rely heavily upon timing for control and coordination; therefore, estimated time of arrival (ETA) and time over target (TOT) must be accurately computed and flown. Failure to do so could result in failure to adequately suppress or destroy an enemy attacking formation, resulting in the loss of a battle position, or the battle itself.

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[22]TACM 2-1, p. 4-2.

JOINT FORCES EMPLOYMENT
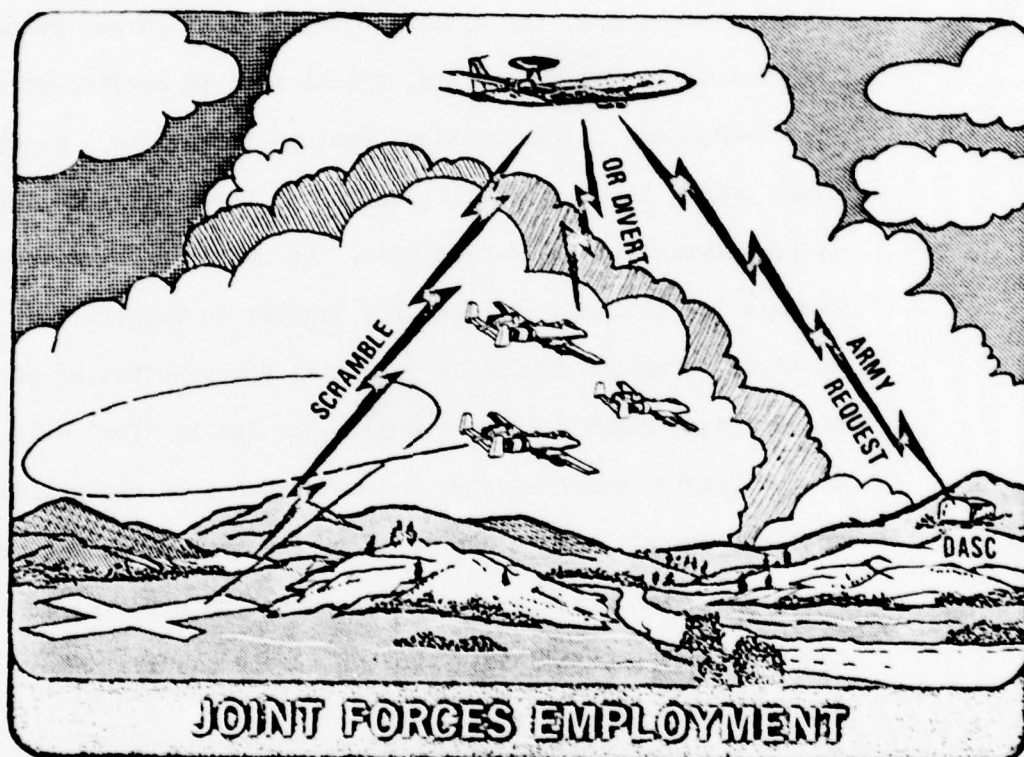
FIGURE 2-5

(Source TACM 2-1)

Enroute target ingress may be a high/low altitude profile or
al low/low altitude profile depending upon target distance, threat and
timing considerations. (Refer to Figure 2-6 for a graphic illustration
of flight profiles) High or medium altitude formations will be tactical
formations and should be tailored to size, threat probability and pilot
proficiency.[23] Although two aircraft in a flight is the basic fighting
element (two-ship), the situation may warrant larger formations during
the enroute phase. Therefore, pilots must be proficient in four aircraft
(four-ship) and larger tactical enroute formations. At some predeter-
mined point, the flight will descend to lower altitude for the low al-
titude ingress to the target area. As stated earlier, conditions may
dictate low altitude ingress from takeoff to target. Low altitude
tactical formation flying is essential for penetration of the enemy's
air defense umbrella (Figure 2-7). How low is "low" will be determined
by the flight leader/mission commander based on visibility, terrain,
weather, threat, target and pilot proficiency. The latter is very
important. An inexperienced pilot cannot be expected to ingress a
100 ft. above ground level (AGL) unless he has trained at that level
and is comfortable at that level.

Another very important aspect of low level flying is navigation.
It is important that exact routes be flown with little flight path and
timing variation. Plus or minus two minutes should be the maximum
error since airspace management in the central battle will be very

[23]High altitude is greater than 20,000 ft. above the ground
level (AGL). Medium altitude is 20,000 ft. AGL or less and greater
than 1,000 ft. AGL. Low altitude is less than 1,000 ft. AGL.

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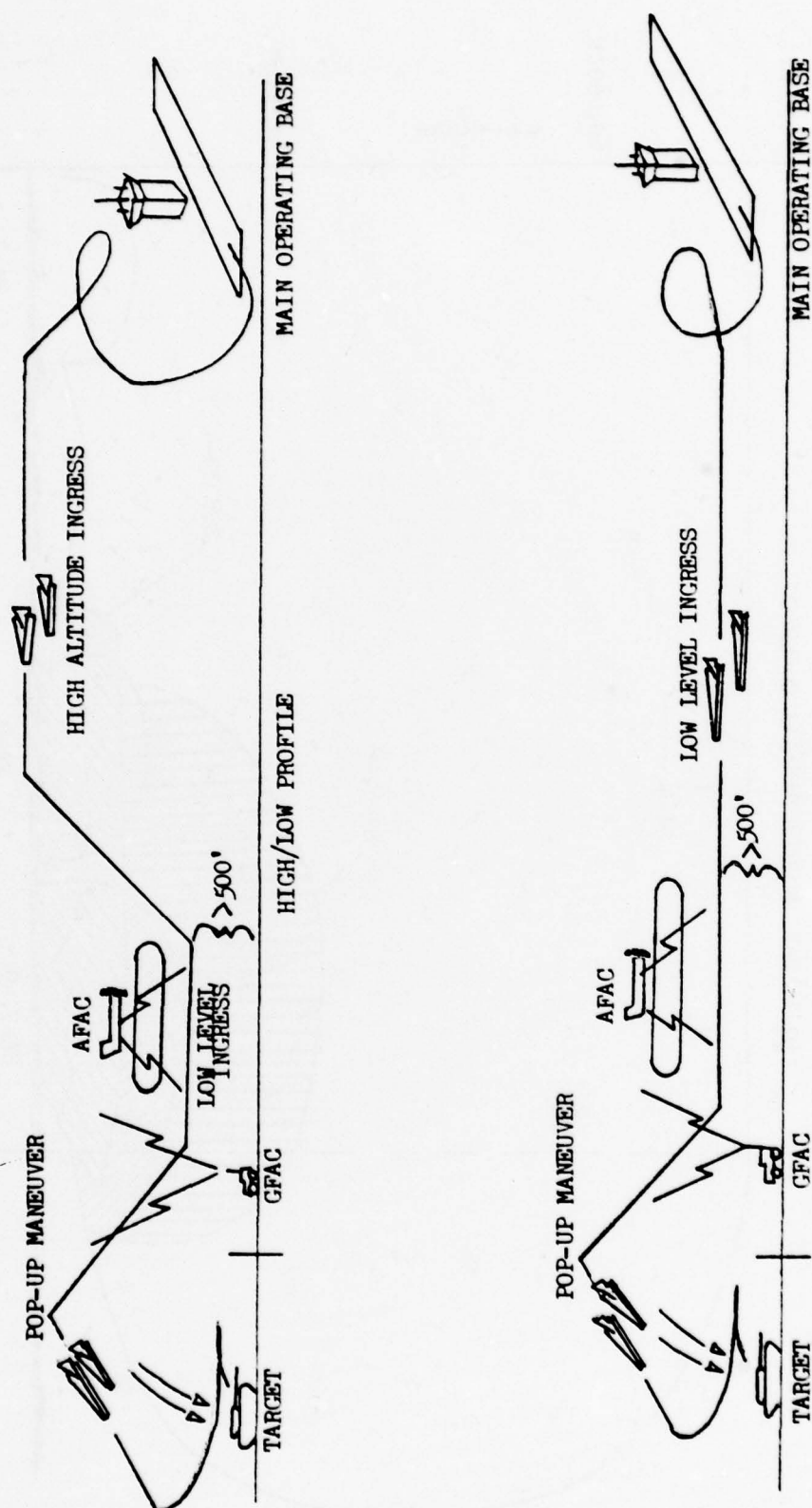
FIGURE 2-6 FLIGHT PROFILES

FIGURE 2-7 MOBILE SAM/AAA COVERAGE
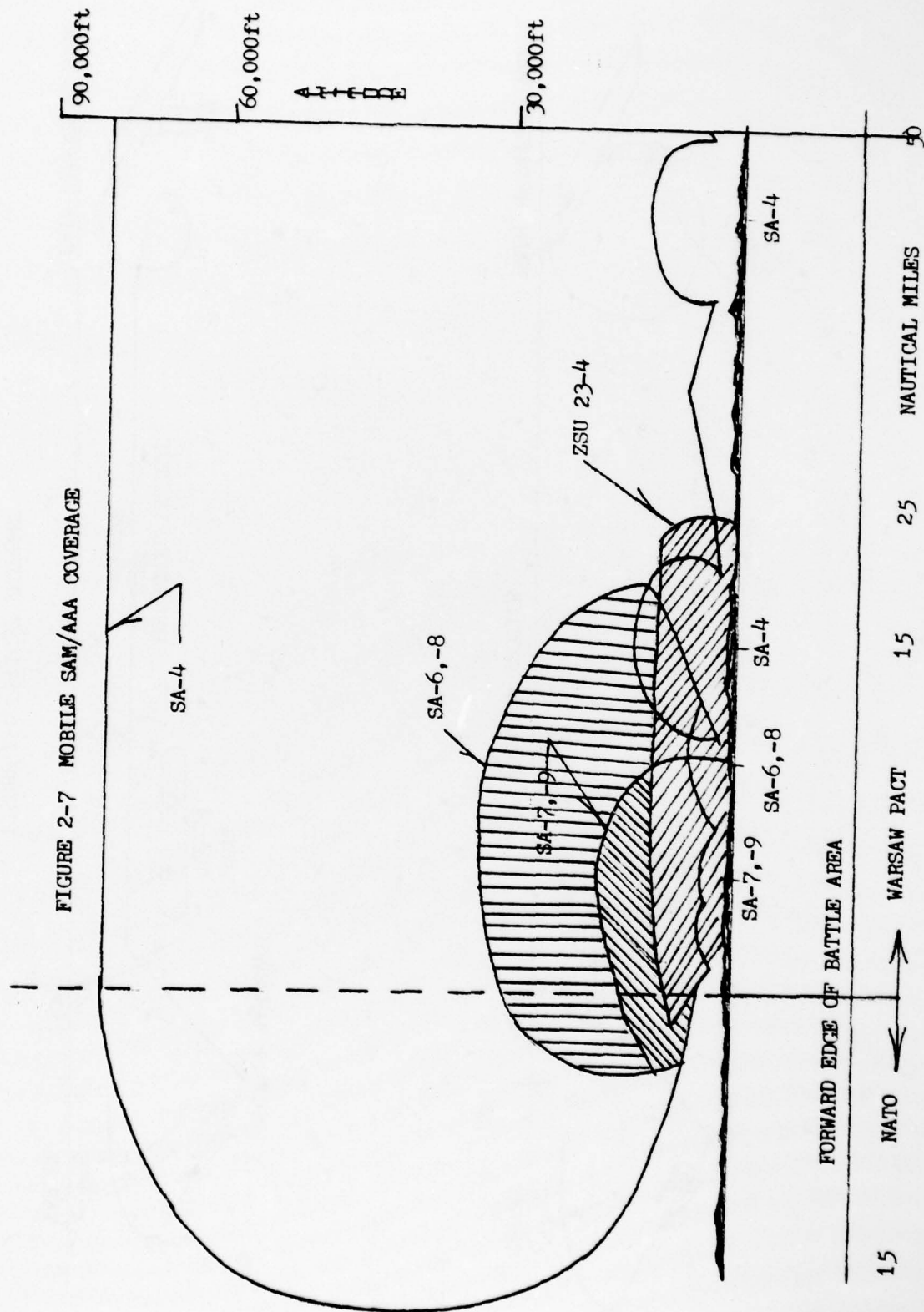
complex and critical, and target ingress routes will be opened for
only specific time periods.

Suppression of enemy air defenses (SEAD) will also be time
critical. A close air support mission may be sequenced to follow an
extensive joint SEAD operation. Inaccurate timing would void the
suppression effectiveness. Some close air support aircraft have ex-
cellent low level navigation systems (A-7D IMS/computer controlled),
unfortunately others rely on pure pilotage/dead reckoning.

Along with the ability to navigate is the requirement to remain
alert and vigilant for enemy aircraft. If engaged, effective dissimilar
air combat tactics (DACT) must be employed. The enemy's goal is to
prevent the ordnance from reaching the target. Forcing a strike flight
to prematurely jettison its ordnance to defend against the attack
accomplishes that mission. The skill and knowledge required from the
IP to the target are similar to that previously discussed except that
the threat will directly increase with proximity to the FEBA.

One very important requirement, identified here but necessary
throughout the mission, is Electronic Countermeasures (ECM) proficiency.
Pilots must be intimately familiar with the threat, radar warning and
receiver (RWR) indications and operation, and correct ECM responses
and evasive actions. Failure to properly interpret a signal or a
wrong response to a signal might jeopardize the entire flight and mission.
The expected air defense array around the FEBA is graphically displayed
at Figure 2-7.

Another critical requirement in this segment of the mission is
proper coordination with the FAC or other controlling elements. Pilots

must be able to copy vital target information, enter it into the air-craft systems, and above all, understand and fly it without running into the ground! A typical scenario might call for the FAC to pass the location of the IP, ingress heading, pop-up point, direction to look for the target, target description, enemy dispositions, friendly dis-positions, egress headings and altitudes. All of this must be assimilated while flying at low altitude, in formation, along a prescribed route, in a hostile environment, in a single seat aircraft and possibly in a communications jamming environment. Needless to say, pilot workload is extremely high.

The communications jamming may come from the enemy, or it may come from friendly forces. An Army corps has enough electronic emissions to effectively jam itself, let alone USAF aircraft, unless Army and NATO communications electronic operating instructions (CEOI) are strictly followed. Add enemy communications, enemy jamming, deception and intrusion on top of this, and unrestricted radio communications can be considered a remote possibility. Therefore, pilots must plan to imple-ment procedures designed to facilitate operations in a communications jamming environment. These procedures are known as "chattermark."[24]

One of the most critical close air support skill requirements is pop-up delivery proficiency. The pop-up is not a difficult maneuver to execute if the proper parameters of location, airspeed, pull-up angle and dive angle are met. Improper pop-up procedures result in inability to release ordnance (a "dry" pass), a miss, or placing the

[24]Chattermark procedures are code words or signals used to change to pre-briefed frequencies in a jamming environment.

aircraft in an attitude which results in a collision with the ground. Pilots, therefore, must be extremely proficient in all pop-up maneuvers and must be able to execute the delivery in consort with other aircraft against the same or different targets.

Another delivery consideration is Joint Air Attack Team (JAAT) tactics. The 1 April 1978 Draft JAAT Tactics Manual defines the team as "a combination of U.S. Army attack helicopters and U.S. Air Force close air support aircraft operation together to locate, engage and destroy tanks, armored vehicles and other battlefield targets. It is normally supported by U.S. Army field artillery or mortars, sometimes by both."[25] Close air support aircraft are defined in the manual as A-10, A-7, F-4. Therefore, JAAT is applicable to aircraft other than the A-10 which originally performed the JAAT evaluation. All close air support pilots must be proficient in JAAT tactics and prepared to execute them. In the original scenario, JAAT could easily be interjected when the close air support flight contacted the AFAC for instructions. The AFAC provides the necessary information and informs the flight that a JAAT operation will be employed. The GFAC will provide additional information on target array, artillery activity and attack helicopter locations. Attack helicopters would be firing as the close air support aircraft begin and complete the attack. Pilots might use attack helicopters as visual cues to target location. Subsequently, attack helicopters and close air support aircraft reattack and provide mutual suppression, thus increasing the effectiveness and survivability of the other. JAAT, however, requires a high level of proficiency and coordination only achieved through joint training.

[25]Department of the Air Force, Department of the Army, Tactical Air Command and Training and Doctrine Command, Joint Air Attack Team Tactics: How to Fight Manual Draft, (1 April 1978), p. 1.

The ability to work with fire support, field artillery (FA), is mandatory not only for JAAT operations but also for any close air support mission. The success of the central battle close air support mission may depend upon Army SEAD in the form of FA suppression of local enemy air defenses. Pilots must understand FA procedures, coordination measures and effects. The FA coordination will probably be through the GFAC or AFAC; however, there are instances where the pilot may be provided the Fire Support Element's (FSE) radio frequency and told to contact for coordination. In this case pilots must be familiar with the methods available for passing friendly artillery information: grid coordinates, grid lines, and real time observation. Pilots must also be familiar with the methods for separating close air support aircraft and impacting FA rounds: separation by sector, separation by time, and joint attack using real-time observation.[26] Close air support pilots working with FA is the optimization of fire support on the battle-field. Each complements the other and probably is the key to successful close air support in the central battle.

Pilots must be highly proficient in ordnance delivery, including all types of munitions certified for carriage on the aircraft and operations at maximum gross weights. Weapons effects must be known to validate delivery in close proximity to friendly troops. Further, all maneuvering in the target area must be preplanned. Reattacks will be held to a minimum in the high threat environment unless operating in a

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[26] Joint Air Attack Manual, p. 32.

mutually supportive JAAT operation, or if it is considered absolutely essential to the mission. The primary concern should be proper actions on the first pass to preclude the necessity for a reattack.

Egress from the target area should be preplanned. Mutual support should be reestablished, if ever lost, as quickly as possible and evasive maneuvering both in the vertical and horizontal must be employed. If an aircraft is shot down, search and air rescue (SAR) procedures should be implemented, if practical. Close air support aircraft may be tasked to support the SAR or act as the onscene commander if the flight members are SAR qualified.[27] Imminent bailout conditions require immediate maneuvering toward friendly positions or toward pre-briefed, suitable areas. Escape and evasion will be in accordance with theater directives.

Egress procedures should be closely followed for the same reasons identified in the ingress discussion. The situation may require briefing incoming close air support flights and providing the TACS with inflight reports. Familiarity with the area of operations and enemy and friendly dispositions is essential if the information is to be useful. Also, vigilance must be maintained throughout the return to base, recovery and landing. Emergency recovery procedures must be well understood.

Once on the ground, maintenance and munitions personnel must be provided with an accurate assessment of the aircraft's status, and discrepancies must be documented in detail. Intelligence debriefings must be thorough. Anything of even remote interest should be given to

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[27]Fixed Wing USAF pilots qualified to conduct SAR operations use the radio call sign "Sandy" and have often used the term in reference to SAR qualification.

the debriefer. That supposedly insignificant item may be the last indicator needed to prove an enemy capability, intention or vulnerability. Finally, the flight leader must thoroughly debrief the conduct of the mission to reinforce the good aspects and eliminate the bad.

Close air support aircraft are often placed on alert to rapidly respond to Army requests for immediate close air support. Therefore, pilots must be proficient in alert procedures, criteria, possible target areas, and possible ingress and egress routes. Alert is similar to a preplanned mission except less information is initially known concerning target areas. Pilots must be flexible and decisive as to courses of action. Close air support alert is very important and provides the Army increased responsiveness.

The previous discussions proposed several close air support skill and knowledge requirements believed to be necessary for operation in the central battle. Table 2-1 outlines those requirements and offers desired proficiency levels based on the examined characteristics of the modern battlefield. This author considers the listed requirements to be either necessary for effective close air support or to be unique to close air support missions. Proficiency levels have been derived from the simple question, is the requirement necessary for sucessful mission accomplishment, with or without error? If errors are permitted, how great an error? After having examined the characteristics of the modern battlefield and the requirements necessary for close air support mission accomplishment on the modern battlefield, the desired proficiency levels are essentially common sense. Inherent tasks, however, such as aircraft emergency procedures in-flight refueling and instrument flying procedures are assumed and not listed.

SKILL/KNOWLEDGE REQUIREMENTS	DESIRED PROFICIENCY LEVEL	REMARKS
Soviet Doctrine/Tactics	1	
U.S. Army Doctrine/Tactics	1	
Equipment Identification	3	Realism stressed
U.S. Army FA Capabilities	2	
Munitions Characteristics	2	
Area of Operations	2	
C^3/TACS	2	
Flight Planning	3	
Tactical Formations (high)	3	
Tactical Formations (low)	3	
Low Altitude Navigation	3	Low level/LATN
SEAD Program	2	Joint required
ECM/RWR	3	
FAC Procedures	3	
No-comm/Chattermark	3	
Pop-up	3	
JAAT Operations	3	Joint required
FA Coordination	3	Joint required
Ordnance Delivery	3	Chapter 5, 51-50
Egress Procedures	3	
E and E	2	Ground requirement
SAR	2	3 if qualified
Intelligence Procedures	2	
CAS Alert	3	
DACT	3	
NBC Operations	2	

PROFICIENCY LEVELS

LEVEL	CRITERIA
1	Familiarization, errors permitted
2	Proficiency required with minor errors of omission, commission permissable
3	Proficiency required without error

Table 2-1. REQUIREMENTS

CHAPTER III

CLOSE AIR SUPPORT TRAINING PROGRAM

TAC MANUAL 51-50

GENERAL

TAC Manual 51-50 establishes the minimum Air Force standards

for training and qualifying personnel performing duties in the A-7 and

A-10 aircraft.[1] The manual outlines the flying training programs

referred to as the Graduated Combat Capability (GCC).

> The GCC recognizes that the aircrew needs to be provided
> the necessary sorties to train for each assigned level
> of readiness/mission (including specialized weapons/
> unique missions), and that the degree of difficulty and
> training complexity for each task/mission varies. There-
> fore, for each level of readiness/mission a specified
> amount of flying training must be provided. It acknow-
> ledges that due to resource limitations, units may not
> be fully trained to the weapon systems' maximum poten-
> tial. To accomplish full capability, additional resources
> will be necessary.[2]

A review of the three GCC levels is necessary to understand

the program:

> Level A Readiness Training: This is the first level
> to which a unit trains and includes training through-
> out the full spectrum of each weapon system. Aircrews
> may be considered Mission Ready (MR) upon completion
> of all training requirements at this level.

> Level B Readiness Training: This training is dedicated
> to increasing aircrew proficiency and is accomplished
> primarily through increased flying activity. Emphasis

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[1]Department of the Air Force, Tactical Air Command, Flying
Training, Tactical Fighter/Reconnaissance Aircrew Training, (Langley Air
Force Base, Virginia, 1 October 1978) Working Copy, p. 1.

[2]Ibid., p. 1-2.

is on frequency and quality of training with events
and sortie types essentially the same as those in Level A.

Level C Readiness Training: Training at this level is
dedicated toward achieving full potential of the unit's
combat capability by maximizing aircraft sortie prod-
uction and aircrew training. Normally, this level
readiness will be attained only through increased al-
location of resources.[3]

Figure 3-1 provides an illustrative example of the GCC program.

Besides semiannual tactical flying training requirements,
certain proficiency flying requirements must also be accomplished:
penetrations, precision radar approaches, night landings, etc. Further-
more, TACM 51-50 specifies the tactical fighter weapons delivery
qualifications, events hit criteria and scoring procedures. Every
pilot must qualify semi-annually in accordance with the particular
weapon system delivery criteria, eg. low angle bombing criteria for
the A-7D computer delivery system is 50% of all record deliveries must
hit within 75ft of the point target (75ft CE).[4]

To understand specific close air support training requirements,
it is necessary to review certain TACM 51-50 definitions. These defin-
itions and others are also included in the glossary of terms located
on page 92.

Alert Scramble: A scramble take-off from a simulated
or actual alert status.

Air Support Tactics: (AST) Close air support (with or without
a FAC) and air support training missions against targets
specified by the battlefield commander within SAT. (Surface
Attack Tactics-see below).

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[3] Ibid., p. 1-2.

[4] Ibid., p. Table 5-2.

LEVEL C

OPTIMUM TRAINING

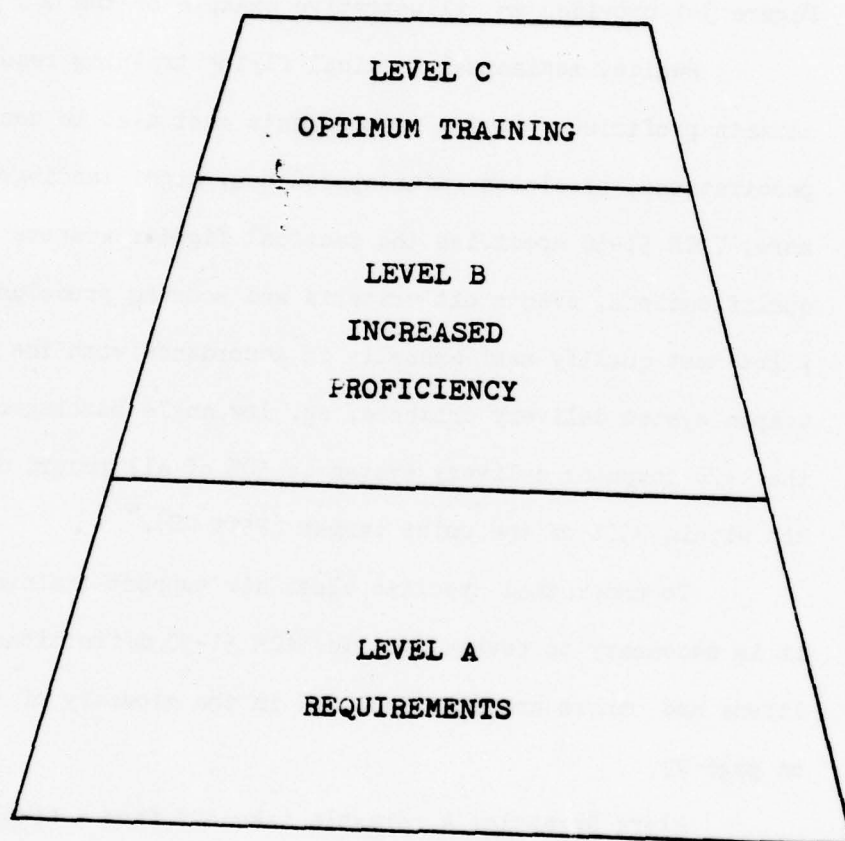LEVEL B

INCREASED

PROFICIENCY

LEVEL A

REQUIREMENTS

FIGURE   3-1. ILLUSTRATIVE EXAMPLE OF GCC

Low Altitude Tactical Navigation (LATN): Stresses area
navigation, using pilotage and indirect routing to
conform to a tactical situation. Flown between 100ft
AGL or as restricted by national/military directives.
Employed primarily by aircraft operating below 250 knots
indicated airspeed (KIAS). (eg. A-10)

Limited Communications Maneuvering: Training in air combat
training or low altitude tactical maneuvering in no
communication/jamming situation. This emphasizes coord-
inationof no-communication turns, radio discipline and
tactical awareness necessary to free communications
channels for imminent threat warning.

Surface Attack Tactics (SAT): An actual or simulated
attack against a surface target. Attacks on the tar-
get will duplicate those normally required for weapons
delivery under combat conditions. Ordnance (live/
inert/training) should be expended on 50% of the SAT
sorties and may be credited against training require-
ments of Chapter 5. Full scale munitions delivery is
encouraged when suitable tactical ranges are available.
Simulated attacks will be conducted against targets
such as bridges, road segments, ships and other tactical
targets located in isolated areas. Scenarios of orders
of battle, to include radar, automatic weapons, AAA,
SAMs, and defensive air, should be simulated for every
phase of planning and execution of this mission. Flight
integrity should be emphasized with each flight member
assigned specific primary and secondary responsibilities
necessary to properly conduct SAT training. The con-
cept of this training is to exercise all elements of
a tactical fighter unit structure. SAT may be done
under the control and direction of a qualified FAC. The
FAC may be in an observation position on the ground or
airborne.[5]

The following ground training is required of all tactical

fighter pilots/aircrews:

Semiannual Aircrew Weapons/Tactics Academics: This
program is designed to provide standardized tactics
training and weapons certification. Pilots are eval-
uated at the end of each block of instruction.

Electronic Warfare Training Program: This program con-
sists of both academic and simulator training (if

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[5]Ibid., p. 7-13.

available). Training covers Radar Warning and Re-
ceiver (RWR) ECM, Electronic counter-counter measures
(ECCM) and operating in a communications jamming
environment. An evaluation is required.

Aircrews Target/Area Certification/Verification Program:
This training is designed to insure pilots tasked
under OPLANS or other tasking such as Tactical Tar-
geting Scenarios (TTS), receive specific training and
operational knowledge necessary to perform wartime
duties. Training normally involves simulator training,
intellegence training and individual study and eval-
uation before a select board.[6]

Flying training is the key to readiness. TAC's stated goal is

"to provide the most realistic training possible, compatible with an

individual's experience level....Tactical training should emphasize

the employment of basic skills in realistic training scenarios/profiles

...."[7] The overall objective of the TACM 51-50 Air Support Tactics

training is to achieve increased combat capability to penetrate enemy

defenses, acquire and destroy enemy targets and survive.[8] In other

words, realism is the "watchword" of tactical training. Air Support

Tactics, close air support, "should be conducted with a slow, SCAR

(Strike Control and Reconnaissance aircraft) or ground FAC with or with-

out ordnance expenditure in a tactical training area."[9] TACM 51-50

also establishes a low level training program designed to qualify pilots

down to the lowest altitude commensurate with their ability. Other

programs establish Electronic Warfare and other tactical event require-

ments such as air refueling, sortie surge and air-to-air training.

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[6]Ibid., Chap. 6.

[7]Ibid., p. 6-12.

[8]Ibid., p. 6-13.

[9]Ibid., p. 6-14.

TACM 51-50 also states that combat exercises and joint operations which provide pilots with an opportunity to accomplish EW, Composite Force and DACT training are a valuable part of GCC training.[10] Additionally, TACM 51-50 requires each pilot to participate in a Red Flag exercise semi-annually.[11] Composite Force training can be scheduled in lieu of Red Flad participation.

The aforementioned programs/requirements are applicable to all tactical fighter pilots. There are, of course, others which were not mentioned because they did not directly impact on close air support training.

A-10 AIRCREW TRAINING

Table 3-1 outlines the current A-10 semiannual continuation training sortie and event requirements (day only). Sorties are defined as one entire mission, takeoff to landing, devoted to a specific type mission, eg. Surface Attack Tactical (SAT). An event is a requirement accomplished on a sortie. More than one event may be accomplished on a sortie, eg. Communications Jamming (Comm Jamm) and Maverick missile training accomplished on a single SAT sortie. A unique aspect of an "event" that may be somewhat confusing is that not all events are specific training tasks. For example, "low angle bomb delivery" is a task, but "high threat tactics" is a mission scenario not a specific task.

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[10] Ibid., p. 6-13.

[11] Red Flag is a Tactical Air Command realistic training exercise conducted at Nellis AFB, NV. Red Flag stresses composite force tactics operations involving coordination of mutually supportive weapon systems.

SORTIES:*	LEVEL A	LEVEL B	LEVEL C
Weapons Delivery	9/5	2/1	
SAT	16/10	4/3	8/3
Maverick Missile	8	2	2
Air Combat Training	6/4	2/1	2/1
Search and Rescue		2/2	2/2
Subtotals	39/27	12/9	14/8
Total GCC (including nite)	45/33	67/50	87/64

EVENTS:	LEVEL A	LEVEL B	LEVEL C
Low Angle Strafe	Qual		
Low Angle Strafe (tactical)	6	6	6
Two Target Strike (A)	2	1	2
High Angle Strafe	1		1
Low Angle Bomb	Qual	3	2
Level Low Angle Bomb	2		
Low Angle Low Drag Bomb	Qual	3	2
Dive Bomb	Qual	3	2
Maverick Missile Tng	Qual	1	6
Pave Penny Laser System	3	4	4
Rockets		1	1
Pop-ups (B)	25%	25%	25%
Flare (Nite Reqmt)	2		
High Threat Tactics	6	6	6
Low/Medium Threat Tactics	2		
SAT with FAC	3		
SAT without FAC	3		
Low Altitude Tactical Nav	6	6	4
Low Altitude Tactical Form (C)	6	6	6
Low Level	1		
Radar Warning Receiver		3	2
Comm Jamm	6	6	4
Full Scale Weapons Delivery (D)	1	1	1
Search Pattern and Proced		2	1
Helicopter Escort		2	1
JAAT (if qualified) (E)		3	2
Forward Operating Location Ops	1		
Air Support Radar Team		2	

*_/_ first number is <u>inexperienced</u> pilot requirement, second is experienced pilot requirement.

NOTES:

(A) Two Target Strike: Strafing at two targets on the same pass.

(B) 25% of all deliveries must be from the pop-up.

(C) Low Altitude Tactical Formation: Tactical formation flown at or below 500ft AGL.

(D) Full Scale Weapons Delivery: Flight and delivery of at least 3000lbs of live or inert ordnance.

(E) JAAT: Combined operations with attack helicopter team. Minimum of 25% Mission Ready pilots will be JAAT qualified.

Table 3-1. A-10 Semiannual Training Requirements (DAY)

This aspect may be better understood by looking at a typical sortie and its possible event combinations:

        Sortie:

           Surface Attack Tactical (SAT)

        Events: (to be accomplished during the sortie)

           low angle strafe

           two target strike

           low angle low drag bomb

           dive bomb

           pop-ups

           SAT without FAC

           high threat tactics

           low level

It is important to remember that all Level A sorties and events must be accomplished before proceeding to Level B. If the unit is unable to produce enough sorties to proceed to Level B, then the maximum proficiency level would be Level A. Also, Weapons Delivery sorties are routine training missions normally accomplished on a scorable gunnery range complex rather than a tactical gunnery range. Scorable ranges are designed for scoring weapons delivery, bombs and strafe, under rigidly controlled conditions. Tactical ranges are designed to similate a battlefield but normally do not possess a scoring capability. Tactical ranges, however, equipped with TV Optical Scoring Systems (TOSS) can be used to achieve weapons delivery qualifications.

A-7D AIRCREW TRAINING

Table 3-2 outlines the current A-7D semi-annual continuation training sortie and event requirements (day only).

SORTIES:	LEVEL A	LEVEL B	LEVEL C
Weapons Delivery	9/7	2/1	2/1
SAT	15/9	3/2	4/3
Maverick Missile	4	4/3	6/4
Air Combat Training [A]	6/4	3/2	2
SAR [B]		(3)	(4)
Subtotal	34/24	12/10	14/10
Total GCC (including nite)	40/30	60/45	82/61

NOTES:
A. Whenever possible dissimilar air combat training will be substituted.
B. Only applies to Search and Air Rescue qualified pilots.

EVENTS:	LEVEL A	LEVEL B	LEVEL C
Low Angle Strafe [A,B]	Qual	2	1
Low Angle Bomb [A,B,C]	Qual	4	6
Low Angle Low Drag Bomb [A,B]	Qual	3	6
Dive Bomb [A,B]	Qual	3	6
High Altitude Dive Bomb [A,B]		Fam	Qual
High Angle Strafe [A,B]		Fam	Fam
Rockets		Fam	Fam
Flares			
Low Level Navigation	6	6	6
SAT with FAC	2	2	2
SAT Alert		2	2
Pop-up Maneuver	25%	25%	25%
Maverick	2	Qual	2
Full Scale Weapons Delivery [D]	1		1
Composite Force Training		2	2
ECM		1	1
RWR		1	1
Air-to-air Refueling	2		
Communications Jamm	6	2	2
Radar Offset Delivery		1	1
Air Support Radar Team		2	

NOTES:
A. Computer deliveries except two must be manual.
B. Weapons Delivery or SAT sorties will be used to satisfy requirement.
C. Level or skip bomb will suffice.
D. Must be at least 3,000 lbs of external ordnance.

Table 3-2. A-7D Semiannual Training Requirements (DAY)

CHAPTER IV

PROGRAM EVALUATION

SORTIE TYPE AND DISTRIBUTION vs. SKILL/KNOWLEDGE REQUIREMENT

It is now time to compare the postulated modern battlefield
close air support requirements with the actual requirements as spec-
ified in TACM 51-50. To facilitate this discussion the chart at Figure
4-1 compares the proposed close air support skill and knowledge requir-
ments outlined in Chapter II with the type of sorties required for both
the A-10 and A-7 weapon systems outlined in Chapter III. The chart re-
flects whether or not the sorties contribute to the skill and knowledge
requirement, ie. does the nature of the sortie afford the opportunity
to enhance that particular skill and knowledge requirement? For example,
a Surface Attack Tactics (SAT) sortie would definitely provide the
opportunity to acquire and improve the pop-up delivery skill proficiency,
may contribute to a better understanding of Soviet doctrine and tactics,
but probably would not contribute to a better understanding of ground
escape and evasion (E&E).[1]

Some requirements can better be accomplished through more ground
training than in-flight training. Knowledge of U.S. Army doctrine and
tactics lends itself to ground instruction with reinforcement provided
by aerial observation of Army maneuver and procedures. Conversely,
other skills require primary emphasis on in-flight training with

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[1]Readers may wish to review definitions in the Glossary of Terms.

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LEGEND

☐ SORTIE NOT RELATED TO REQUIREMENT

◩ SORTIE MAY OR MAY NOT INCLUDE THE REQUIREMENT BUT DOES PROVIDE REINFORCEMENT POTENTIAL

⊠ SORTIE NORMALLY INCLUDES THIS TRAINING REQUIREMENT AND POSSESSES DIRECT ENHANCEMENT POTENTIAL

**CHAPTER II
SKILL & KNOWLEDGE REQUIREMENTS**

TACM 51-50

SORTIES

Column headings (knowledge requirements):
SOVIET DOCT & TACTICS · US ARMY DOCT & TACTICS · EQUIPMENT IDENTIFICATION · US ARMY FA CAPABILITY · MUNITIONS CHARACTERISTIC · AREA OF OPERATIONS · C3/TACS · FLIGHT PLANNING · TACTICAL FORMATION (H) · TACTICAL FORMATION (L) · LOW ALTITUDE NAV · SEAD PROGRAM · ELECTRONIC WARFARE · FAC PROCEDURES · NO-COMM/CHATTERMARK · POP-UP · JAAT OPERATIONS · FA COORDINATION · ORDNANCE DELIVERY · EGRESS PROCEDURES · ESCAPE AND EVASION · INTEL PROCEDURES · SAR · CAS ALERT · DACT · NBC OPERATIONS

Row headings (sorties):
A-10 LEVEL A: WEAPONS DELIVERY · SAT · MAVERICK · ACBT · SAR (LEVEL B) · GROUND TRAINING
A-7 LEVEL A: WEAPONS DELIVERY · SAT · MAVERICK · ACBT · SAR (LEVEL B) · GROUND TRAINING

FIGURE 4-1 A-10/A-7 SORTIES

ground training serving as reinforcement. High altitude Tactical For-
mation is best perfected by actual aerial accomplishment rather than
classroom instruction. Figure 4-1 also highlights those requirements
best suited for ground instruction and those merely reinforced through
ground instruction.

The following discussion explains the derivation of Figure 4-1.
Since the type of sorties required are the same for both the A-7 and the
A-10, the discussion does not differentiate, at this point, between the
two weapon systems.

Soviet Doctrine and Tactics are best learned through ground
instruction, except for Soviet air combat tactics which are best learned
through actual aerial training. The USAF "Aggressor" squadrons are
specifically designed to provide the latter instruction and to give
fighter pilots actual exposure to Soviet tactics. Therefore, air combat
training sorties directly enhance the understanding of Soviet air doc-
tine and tactics; whereas, SAT and Maverick training sorties provide
reinforcement.[2]

An appreciation of U.S. Army Doctrine and Tactics, again like
Soviet Doctrine and Tactics, is primarily enhanced through ground
training with aerial exposure to actual Army maneuver units providing
a positive reinforcement. ACBT and Weapons Delivery sorties do not
provide any reinforcement since neither sortie routinely provides ex-
posure to U.S. Army units.

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[2]Maverick training sorties are normally accomplished under a
SAT training scenario rather than a Weapons Delivery environment.

Equipment Identification should be learned and enhanced from aerial observation, but because the Soviet and Warsaw Pact equipment is unavailable in the West for training purposes; and mock-ups are expensive and cumbersome, the primary instructional means must be ground training. However, units should make maximum use of aerial observation for positive training reinforcement. There is no excuse for not being intimately familiar with each piece of U.S. equipment, especially tanks, APC's and self-propelled artillery. European based units should also be familiar with all of the primary NATO equipment. Weapons Delivery sorties may be used for Equipment Identification. For example, M60A1 tanks and M113 APC's can be positioned on gunnery ranges outside the impact zones to reinforce equipment identification.

US Army Field Artillery (FA) Capabilities is similar to U.S. Army Doctrine and Tactics as far as instructional and reinforcement methods are concerned. FA capability is best learned through ground instruction.

Munitions Characteristics training is readily enhanced in all air-to-ground sorties, and air-to-air munitions characteristics are reinforced in ACBT sorties. Furthermore, ground training is an excellent media for learning the many types of munitions and their characteristics. Expenditure of every type of munition certified for carriage on the aircraft is impractical and expensive. Unit Weapons Schools are traditionally an excellent mechanism for accomplishing this requirement. Munitions characteristics training, therefore, is enhanced in almost every available type of sortie and ground instruction.

Potential conflict Area Orientation can only be accomplished through ground instruction since visiting each potential conflict scene is fiscally impossible. Nevertheless, many tactical deployments and exercises are designed to accomplish as much orientation as possible. Primary emphasis, of course, is on European deployments closely followed by Korean deployments. Tactical exercises within the areas are invaluable in obtaining an appreciation of topography, hydrography, vegetation and weather. However, without deployments, ground training is the primary method of orientation. Examples of ground training programs are the Aircrew Target and Area Certification and Verification Programs comprised of intelligence training, simulator training and study of simulated or actual target material.[3] Area operations orientation can be reinforced by conducting SAT sorties over CONUS terrain comparable to probable wartime areas. For example, an incipient handicap to the Red Flag exercises is its desert environment. The exercise may be excellent for a Middle East scenario, but Nevada terrain does not represent Europe. As Red Flag participation increases and more pilots return for third and fourth exercises, the terrain becomes less challenging and more of a detractor.

Command and Control (C^2) and Tactical Air Control System (TACS) operational proficiency is primarily enhanced through SAT sorties and ground instruction with reinforcement capability available in Maverick and ACBT sorties. Weapons Delivery sorties rarely involve Command and Control or TACS procedures and simulation.

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[3] These programs are classified and will not be discussed in this study.

Flight Planning is pervasive throughout the entire sortie spectrum. Every sortie requires good and precise flight planning and provides excellent reinforcement for thorough ground instruction.

SAT and ACBT sorties can enhance high and low Tactical Formation proficiency. Maverick sorties can also provide positive reinforcement, as can ground instruction. Tactical formation flying is a skill best learned through practice and experience.

Low Altitude Navigation is best facilitated through SAT sorties and reinforced by Maverick training sorties and ground training. ACBT does not normally require low level navigation nor do Weapons Delivery sorties. There are always exceptions, and low level navigation requirements could be added to an ACBT or Weapons Delivery sortie. They are, however, normally not included in the ACBT sortie scenarios because of fuel restrictions. Performing low level navigation on an ACBT sortie consumes larger amounts of fuel on an already fuel critical sortie. Fuel is normally less a factor on Weapon Delivery sorties, and low level requirements can often be added with little sortie degradation.

An understanding of the Suppression of Enemy Air Defense (SEAD) Program is best achieved through SAT sorties and ground instruction. Maverick and Weapons Delivery sorties can provide reinforcement if structured to include suppression tactics and delivery parameters. Ground instruction is principally used to understand integration and control requirements. For example, a close air support pilot must realize that during a strike the friendly artillery, which is probably impacting in the immediate vicinity of the target, is vital to his survival. The artillery in a high threat environment may be suppressing the enemy

air defenses just long enough for the close air support strike to go in.

EW training is normally found in SAT, Maverick and ACBT sorties, with a major emphasis placed on thorough ground instruction. Sorties must be flown against ground emitters; therefore, electronic warfare ranges (EWR's) are required. In essence, any tactical mission must be a primary vehicle for accomplishing EW training since the modern battlefield will be an EW battlefield. Furthermore, ground instruction is important in understanding system operation and capabilities.

FAC Procedures are best enhanced through SAT sorties and reinforced through Maverick training sorties and ground instruction. Similarly, no-communications and chattermark procedures are the same except they can, and should, be included in the ACBT sorties.

Pop-up training can be accomplished on any air-to-ground sortie and can be reinforced through ground instruction. The pop-up is a very exacting maneuver in a fighter attack aircraft allowing little margin for error. Reinforcing ground instruction is absolutely necessary.

JAAT Operations and tactics are primarily included in SAT sorties with positive reinforcement potential available in Maverick training sorties and ground instruction. This is also true of FA Coordination training. Weapons Delivery sorties normally would not be compatible with this requirement because artillery rounds cannot be fired on to a scorable air-to-ground gunnery range.

Ordnance Delivery, like the pop-up, is obviously a major aspect of all air-to-ground missions and is easily enhanced on almost all training sorties. Ground instruction provides positive reinforcement, especially in the A-7 aircraft where the weapons delivery system is

computer controlled and requires a thorough understanding of the avionics systems.

Egress or post weapons delivery procedures and tactics are principally included in SAT sorties with Maverick sorties and ground instruction reinforcement. Evasive maneuvers are an important aspect of post-delivery procedures and must be practiced for proficiency.

Ground Escape and Evasion (E&E) and Intelligence Procedures are almost entirely ground instruction items. The former usually is taught by Life Support personnel, the latter by Intelligence personnel. The exception is intelligence reports, eg. Flight Reports (FLTREPS), which can be practiced on SAT sorties. Post-strike FLTREPS can be forwarded to unit Command Posts for added realism.

Search and Air Rescue (SAR) is not included in Proficiency Level A sorties. SAR sorties are included in Level B and Level C. Reinforcement is available through ground instruction, but the primary training vehicle must be the SAR sortie. Combat SAR is similar to any maneuver tactics. There is established doctrine, but the actual tactics are "situationally dependent." No single tactic will work repeatedly. SAR pilots must learn to adapt procedures and techniques to the situation at hand.

Close Air Support Alert Procedures training is principally included in SAT sorties with a Maverick and ground training reinforcement capability. Ground instruction can emphasize cockpit set-up procedures ("cocking" the aircraft) and safety procedures. This requirement exemplifies the need for interface between Operations and Maintenance personnel. A close air support alert operation requires extensive

planning, coordination and practice.

DACT is enhanced on ACBT sorties, but positive reinforcement is available on SAT sorties. Fully loaded strike aircraft can practice "look out" techniques against dissimilar type aircraft, eg. F-5E "aggressor" aircraft, and when attacked, practice initial movements to defeat the attack. Of course, ground instruction can be very beneficial and reinforce ACBT training.

The last requirement, Nuclear, Biological and Chemical (NBC) environment operations and employment is essentially a ground training requirement with reinforcement possible through SAT sorties; however, one is led to believe this requirement has been overlooked, since TACM 51-50 does not address NBC anywhere in the manual. NBC can easily be included in training programs through ground instruction and unit NBC scenario development. Nevertheless, it must be specified and emphasized in TACM 51-50.

Consequently, except for the fact there are no SAR sorties in Proficiency Level A and there are no references to NBC operations, the potential exists for all the modern battlefield close air support skill and knowledge requirements to be acquired and enhanced in the four types of sorties at Proficiency Level A: Weapons Delivery, SAT, Maverick and ACBT.

The next question is whether or not the number of sorties is sufficient to attain the desired proficiency levels specified in Chapter II. This question is not easily answered because attainment of a proficiency level is not directly dependent on flying a specified number of sorties. For example, the above discussion has determined that the type of sorties required at Proficiency Level A permits acquisition and

enhancement of Low Altitude Navigation proficiency. The primary sortie type for Low Altitude Navigation is SAT with Maverick training sorties providing reinforcement. The desired Low Altitude Navigation proficiency level is 3. Do the 16 SAT sorties and the 8 Maverick sorties for inexperienced A-10 pilots equate to Level 3 achievement? The answer is probably yes. However, if not, additional sorties can be prescribed by the unit commander, or Low Altitude Navigation can be added to another type sortie, for example ACBT, even though Low Altitude is normally not included as an event in ACBT sorties.

Individual ability may also permit some pilots to achieve Level 3 proficiency with only a few sorties while others require more. It is, therefore, impossible to precisely equate sortie levels to proficiency levels. However, a subjectively derived quantitative comparison can be made between the number of sorties available for a given requirement and the Chapter II desired proficiency levels. Figure 4-2 reflects the author's mathematical expression of requirement sortie availability and its derivation from Figure 4-1 and TACM 51-50 data.

Referring to Figure 4-2, the mathematical expression of sortie availability is comprised of the percentage of type sorties required by TACM 51-50 per training period (six months) multiplied by a factor representing the particular sortie's ability to enhance a close air support skill and knowledge requirement based on the data presented in Figure 4-1. Note that the percentage of sorties alloted to each type of training sortie (S_{t_i}). Weapons Delivery, SAT, etc., is almost identical for the A-10 and the A-7. The only significant difference is a greater emphasis on Maverick training in the A-10 than in the A-7.

AVAILABILITY FACTOR (A_f) DERIVATION

A-10 Skill and Knowledge Requirement

S_{t_i}

SORTIE ALLOTMENT	ENHANCE-MENT FACTOR	PRIMARY P (1.0)	REINFORCE-MENT R (0.5)	NON-RELATED N (0.0)
Weapons Delivery S_{t_1}	(.23)			
S_{t_2}	SAT (.41)			
S_{t_3}	Maverick (.20)			
S_{t_4}	ACBT (.16)			

TOTAL: $(S_t \times P) + (S_t \times R) + (S_t \times N) =$ AVAILABILITY FACTOR (A_f)

$$S_{t_i} = \frac{\text{TOTAL \# TYPE SORTIES}}{\left(\dfrac{\text{TOTAL \# OF SORTIES}}{\text{TRAINING CYCLE}}\right)} =$$

TYPE SORTIE	A-10	A-7
1 – Weapons Delivery	.23	.26
2 – SAT	.41	.44
3 – Maverick	.20	.11
4 – ACBT	.16	.18

i=1to4

ENHANCEMENT FACTORS:

Primary = P = 1.0

Reinforcement = R = 0.5

Non-related = N = 0.0

Note: Ground instruction is awarded an equal weighting factor whether primary or reinforcing; therefore, ground instruction is not included in the A_f.

FIGURE 4-2. AVAILABILITY FACTOR DERIVATION

The Availability Factor (A_f) computations use a value of 1.0 for the Primary Enhancement Factor (P), 0.5 for the Reinforcement Enhancement Factor (R) and 0.0 for the Non-Related Enhancement Factor (N). All ground instruction was considered to be of equal value although some ground instruction only reinforces the requirement and is not really a primary contributer to proficiency. The rationale for the equal weighting is that ground instruction is not a finite entity like sorties are. This conclusion may appear to be arbitrary since realistically there are definite limits to the amount of ground training that can be administered or accomplished. Nevertheless, when compared to sortie constraints, ground training is relatively unrestricted. Ground training, therefore, can be increased as required, thus the constant value and elimination from the computation.

A_f represents the sorties available to accomplish the skill and knowledge requirements. The equation assumes the requirements are not mutually exclusive and that multiple requirements can be accomplished or reinforced on a sortie, if the sortie is available. Ground training is assumed to be a constant value for the reasons discussed above. The A_f for the Chapter II skill/knowledge requirements are listed in Table 4-1. Note that SAR is given a zero (0) since no sorties are allocated at Proficiency Level A, and Escape and Evasion is given a zero (0) since it is purely a ground instruction item.

By ranking the requirements according to A_f and comparing the rank order with the Chapter II desired proficiency levels, an assessment can be made as to whether or not the TACM 51-50 training program provides enough of the particular type sorties needed to emphasize the

A-10 and A-7 REQUIREMENTS AVAILABILITY FACTORS

REQUIREMENTS	A-10 A_f	A-7 A_f
Soviet Doctrine and Tactics	.305	.270
US Army Doctrine and Tactics	.305	.270
Equipment Identification	.420	.400
US Army FA Capability	.305	.270
Munitions Characteristics	.920	.910
Area of Operations	.205	.220
C^3/TACS	.590	.580
Flight Planning	.500	.490
Tactical Formation (High)	.670	.670
Tactical Formation (Low)	.670	.670
Low Altitude Navigation	.510	.510
SEAD Program	.630	.620
FW/RWR	.590	.580
FAC Procedures	.510	.490
No Comm/Chattermark	.670	.670
Pop-up	.840	.810
JAAT Operations	.510	.490
FA Coordination	.510	.490
Ordnance Delivery	.340	.310
Egress	.510	.490
Escape and Evasion	.000	.000
SAR	.000	.000
Intelligence Procedures	.205	.220
CAS Alert	.510	.490
DACT	.360	.400
NBC Operations	.205	.220

TABLE 4-1

close air support skill and knowledge requirements. Table 4-2 reflects
the comparison. Note that program sortie availability compares favor-
ably with the desired proficiency levels for the individual requirements.
Those requirements where the A_f exceeds the desired proficiency level
are not considered to be degraded. On the contrary, these requirements
are actually elevated to a higher proficiency level without degrading
other requirements.

From this analysis one can conclude the TACM 51-50 type sortie
distribution is favorably aligned with the Chapter II close air support
skill and knowledge requirement proficiency levels.

TRAINING PROGRAM EVENTS vs. SKILL/KNOWLEDGE REQUIREMENTS

The events required by the TACM 51-50 training program will be,
like the sortie discussion above, confined to Proficiency Level A since
these events are required to maintain Mission Ready (MR) status. The
Level B and C events are guidelines only and are to be followed at the
discretion of the squadron commander "to improve aircrew proficiency
and enhance training productivity."[4] The Level A events are those
deemed necessary to maintain a Mission Ready status. It is, therefore,
necessary to compare these Level A events with the close air support
skill and knowledge requirements to see if they satisfy, enhance or
neglect the requirements.

Figures 4-3 and 4-4 graph the correlation between TACM 51-50
Proficiency Level A events and the close air support skill and knowledge

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[4]Department of the Air Force Tactical Air Command, Flying Training,
Tactical Fighter/Reconnaissance Aircrew Training, Langley Air Force Base,
Virgina, (1 October 1978) Working Copy, p. 4-3.

REQUIREMENTS RELATIVE A_f RANKING	$A_f(A-10)$[*]	DESIRED PROFICIENCY LEVEL
Munitions Characteristics	.920	2[**]
Pop-up	.840	3
Tactical Formation (High)	.670	3
Tactical Formation (Low)	.670	3
No Comm/Chattermark	.670	3
SEAD Program	.630	2[**]
EW	.590	3
C^3/TACS	.590	2[**]
JAAT Operations	.510	3
FA Coordination	.510	3
FAC Procedures	.510	3
Low Altitude Navigation	.510	3
CAS Alert (Median 1.51)	.510	3
Egress Procedures	.510	3
Flight Planning	.500	3
Equipment Identification (Average 1.41)	.420	3
DACT	.360	3
Ordnance Delivery	.340	3
U.S. Army FA Capabilities	.305	2
Soviet Tactics and Doctrine	.305	1[**]
U.S. Army Tactics and Doctrine	.305	1[**]
Area Operations	.205	2
NBC	.205	2
Intelligence Procedures	.205	2
E&E	.000[***]	2
SAR	.000	2

[*]A-7 A_f is essentially the same as the A-10.

[**]A_f exceeds desired proficiency level.

[***]Ground instruction only.

TABLE 4-2

LEGEND

☐ NO CORRELATION POSSIBLE

◰ REINFORCEMENT POSSIBLE

⊠ DIRECT CORRELATION POSSIBLE

SKILL AND KNOWLEDGE REQUIREMENTS

A-10
TACM
51-50
EVENTS

Skill and Knowledge Requirements (columns):
- SOVIET TACTICS & DOCT
- US ARMY TACTICS & DOCT
- EQUIPMENT IDENTIFICATION
- US ARMY FA CAPABILITY
- MUNITIONS CHARACTERISTIC
- AREA OF OPERATIONS
- C3/TACS
- FLIGHT PLANNING
- TACTICAL FORMATION (H)
- TACTICAL FORMATION (L)
- LOW ALTITUDE NAV
- SEAD PROGRAM
- ELECTRONIC WARFARE
- FAC PROCEDURES
- NO-COMM/CHATTERMARK
- POP-UP
- JAAT OPERATIONS
- FA COORDINATION
- ORDNANCE DELIVERY
- EGRESS PROCEDURES
- ESCAPE & EVASION
- SAR
- INTEL PROCEDURES
- CAS ALERT
- DACT
- NBC OPERATIONS

Events (rows):
- LOW ANGLE STRAFE
- LAS (TACTICAL)
- TWO TGT STRIKE
- HIGH ANGLE STRAFE
- LOW ANGLE BOMB (LAB)
- LEVEL LAB
- LOW ANGLE LOW DRAG
- DIVE BOMB
- MAVERICK
- PAVE PENNY
- POP-UPS
- HIGH THREAT TACTICS
- LOW/MEDIUM THREAT TACTICS
- SAT WITH FAC
- SAT WITHOUT FAC
- LATN
- LATF
- LOW LEVEL
- COMM JAMMING
- FULL SCALE WEAPONS DELIVERY
- FOL OPERATIONS

FIGURE 4-3 A-10 EVENTS

☐ NO CORRELATION POSSIBLE

☒ REINFORCEMENT POSSIBLE

⊠ DIRECT CORRELATION POSSIBLE

SKILL AND KNOWLEDGE REQUIREMENTS

A-7
TACM
51-50
EVENTS

Events (rows):
- COMPUTED LOW ANGLE STRAFE
- COMPUTED LOW ANGLE BOMB
- COMPUTED LOW ANGLE LOW DRAG
- COMPUTED DIVE BOMB
- LOW LEVEL NAVIGATION
- SAT WITH FAC
- POP-UP
- MAVERICK
- FULL SCALE WEAPONS DELIVERY
- COMM-JAMMING

Skill and knowledge requirements (columns):
- SOVIET DOCT & TACTICS
- US ARMY DOCT & TACTICS
- EQUIPMENT IDENTIFICATION
- US ARMY PA CAPABILITY
- MUNITIONS CHARACTERISTIC
- AREA OF OPERATIONS
- C3/TACS
- FLIGHT PLANNING
- TACTICAL FORMATION (H)
- TACTICAL FORMATION (L)
- LOW ALTITUDE NAV
- SEAD PROGRAM
- ELECTRONIC WARFARE
- FAC PROCEDURES
- NO-COMM/CHATTERMARK
- POP-UP
- JAAT OPERATIONS
- FA COORDINATION
- ORDNANCE DELIVERY
- EGRESS PROCEDURES
- ESCAPE & EVASION
- SAR
- INTEL PROCEDURES
- CAS ALERT
- DACT
- NBC OPERATIONS

FIGURE 4-4 A-7 EVENTS

requirements. A cursory examination of each figure reveals little correlation and reinforcement potential exists between the TACM 51-50 events and the Chapter II requirements.

The A-10 chart at Figure 4-3 shows the preponderance of events to be weapons related, eg. strafe, bombing and missile systems oriented. The bulk of the reinforcement potential exists within four events: High Threat Tactics, Low/Medium Threat Tactics, SAT with FAC, and SAT without FAC. The main reason for this phenomenon is the four events are scenario oriented rather than task oriented. They are able to absorb multiple skill and knowledge requirements, whereas the Dive Bomb event relates only to weapons delivery and munitions requirements. Scenarios, therefore, are much more flexible events than are task oriented events.

Figure 4-3 also reveals certain requirements which do not directly correlate and are not reinforced by any event. ECM/RWR , JAAT Operations, E&E, SAR and DACT fall into this category. ECM/RWR, JAAT Operations, and SAR are included in Level B and C and are not included in Proficiency Level A required events. DACT is encouraged on ACBT sorties. Consequently, the requirements are not actually neglected, they are just not considered important enough to be included at Level A.

Turning now to Figure 4-4, the A-7 event/requirement correlation chart, one immediately discovers a striking contrast between the A-10 and A-7 events required at Proficiency Level A. The A-7 program has approximately 50% fewer required events than the A-10 program.

The same observation can be made about the A-7 program as was made about the A-10 program. The events are task oriented rather than scenario oriented. The A-7 events list, however, contains only one

scenario event rather than the four A-10 scenario events. Consequently, the A-7 program is not able to absorb as many skill and knowledge requirements as the A-10 program.

Again, there are many skill and knowledge requirements that do not correlate with an A-7 event and are not reinforced by an event. Nevertheless, these requirements are either included in Level B and C events or are recommended elements of certain sorties, eg. DACT is once again the desirable method of accomplishing ACBT sorties. The general observation made of the A-10 program is again applicable to the A-7 program. Requirements are not being neglected, rather the requirements are not considered important enough to be specifically included in Level A events.

With only a few exceptions, all of the Chapter II close air support skill and knowledge requirements can be acquired and enhanced in the four types of sorties assigned the A-10 and A-7 TACM 51-50 training programs. The exceptions are Search and Air Rescue (SAR) training sorties and Nuclear Biological and Chemical (NBC) training.

SAR sorties are not included in Proficiency Level A. This may be undesirable since the principal weapon systems for SAR on-scene command, or "Sandy," are the A-10 and A-7. Circumstances could arise where all units were maintaining Level A because of resource restrictions, such as fuel, and under these conditions, theoretically, no pilot could be SAR qualified, or at least current. This may be an extraordinary occurrence; nevertheless, under the existing program it could be possible. A solution would be to lower SAR qualification from Level B to Level A and require a minimum number of pilots to maintain currency.

The other noteworthy exception is NBC training. Needless to say, NBC training has lately been the stepchild of all the services. Only recently, with the massive effort made by the Soviets in chemical warfare and the renewed emphasis on theater nuclear forces (TNF), has NBC training been revived. Secretary of Defense Brown stated, "The Soviets continue to maintain a significant chemical warfare capability....It is likely that the Soviets would consider using a combination of chemical and conventional weapons, as well as a combination of chemical, nuclear and conventional weapons...."[5]

The fact that TACM 51-50 is totally devoid of reference to NBC training indicates a lack of emphasis in this reemerging, vital area. The requirement is essentially ground training and equipment familiarization, especially in chemical warfare. In the nuclear environment, however, there is an even greater void. Employment tactics and operational procedures must be developed, or resurrected, and nuclear operations must be included and emphasized in training programs.

With these two significant exceptions, SAR and NBC training all the other skill and knowledge requirements can be accommodated in the four types of sorties assigned the A-10 and A-7 programs at Level A. Furthermore, the study reveals that the TACM 51-50 type sortie distribution is favorably aligned with the proficiency levels assigned the close air support skill and knowledge requirements.

Analysis of the required events led to two observations: first, the vast majority of the required events are task oriented rather than

[5]Department of Defense, Annual Report Fiscal Year 1979, Harold Brown Secretary of Defense, (2 February 1978) p. 157.

scenario oriented; secondly, certain skill and knowledge requirements, although not required events, are not excluded from the TACM 51-50 training programs, rather they are assigned lesser priorities and included at Level B, C or covered elsewhere in TACM 51-50.

This event prioritization is satisfactory as long as the units have the resources to advance to Level B and Level C. If they do not and are restricted to Level A only, then a significant training shortfall could occur. For example, A-7 pilots are not assigned Composite Force Training (CFT) events until Level B and C. CFT events are occasions when all elements of the Tactical Air Control System integrate and operate as a team under realistic conditions. These missions should be included at Level A to insure everyone is exposed to this valuable training.

TACM 51-50 states, "The average level of training for a unit should be maintained at or above Level B. Available sorties beyond those required for Level A MR (Mission Ready) requirements may be selectively allocated to enhance overall unit capability, meet TAC management objectives or meet special requirements."[6] Calculating required sorties at Level A and Level B for a notional fighter wing and comparing this with historical sortie production figures may make the above TACM 51-50 statement optimistic. If erratic sortie production continues to exist, and history indicates it will, then events such as CFT and RWR must be included at Level A training to insure universal exposure to these valuable requirements.

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[6]TACM 51-50, p. 6-6.

Some may wish to argue that including these events at Level A is inefficient because to achieve these events it often requires external resources and support. Requiring all pilots to accomplish at least one of these events could force units to expend excessive resources to achieve only a small number of events. The recommendation addressed in the next chapter is specifically designed to prevent such an inefficient condition.

The analysis of the events revealed a preponderance of task oriented rather than scenario oriented events. Where scenario events were included, as in the case of A-10's , many skill and knowledge requirements could be included in the events. The question then arises, should there be more scenario oriented events? The A-7 program has almost none. Or are scenario oriented events necessary since TACM 51-50 states, "Units will develop training mission scenarios corresponding to their assigned employment tasking. Scenarios will be based upon location, training facilities and known employment plans. They will be updated periodically as new intelligence dictates."[7]

Units have developed these scenarios, and they are used extensively.[8] If this is true should scenario events be included in TACM 51-50? For example, the A-10 program includes High Threat Tactics as an event, and the A-7 program does not. The question is really one of _emphasis_. There should be uniformity among the programs, and if

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[7]Ibid., p. 6-1.

[8]Interview with LtCol James Piner, Chief, Wing Operations and Training Division, 23TFW, England AFB, Louisiana, Feb 1979.

high threat tactics are considered absolutely essential to mission accomplishment then it should be included as an event. If if is not considered absolutely essential but is considered necessary, then it might not be listed as an event but emphasized so that units will include it in their scenarios. The emphasis vehicle can be Chapter 6, Section D, "Flying Training". Paragraph 6-30 states:

> Purpose: This section provides general guidance
> on the objectives of flying training programs.
> Specific guidance will be found in the appropriate
> aircraft volumes of this manual. In this section,
> programs are presented by area of emphasis. TAC's
> goal is to provide the most realistic training
> possible, compatible with an individual's experience
> level. Many of the types of training found in this
> section can be combined when developing unit scenarios.[9]

The section presently includes: Air-to-Surface Tactical Training, Air Support Radar Teams, Low Level Training, Emergency Landing Field Orientation Training, Air-to-Air Training, Air Superiority Alert Training, Sortie Surge, EW Flying Training, Event Requirements Standards, Red Flag Training and other administrative paragraphs. Several of the items mentioned above are outlined in great detail including step-by-step training programs, eg. Low Level Training.

From a close air support viewpoint, Chapter 6, Section D stresses realistic training in multi-level threat environments. Any item, such as NBC operations, could easily be inserted in this section and be assured inclusion in unit mission scenarios. It is not necessary to make every requirement an event, especially if it is a scenario type event. The requirement can be emphasized in Chapter 6, Section D and

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[9]TACM 51-50, p. 6-12.

find its way into the training programs through the locally developed
unit scenarios.

There is one final, but very important, item of emphasis which
has been totally overlooked in TACM 51-50, and that is joint training.
The only joint event required by TACM 51-50 is JAAT, and then only for
25% of the Mission Ready A-10 pilots at Level B and C. The need for
including critical events at Level A has already been addressed along
with the impact of JAAT on every close air support pilot. Fortunately,
the A-7's have begun a JAAT training program on their own initiative.[10]
Beyond JAAT, their is no mention in TACM 51-50 of the value of joint
activities in close air support training. The manual's definition of
joint operations/exercises is "air" oriented:

> Combat exercise/joint operations. Sorties
> devoted to these activities offer aircrews
> further opportunity for EW, composite force
> and dissimilar air combat training and are
> a valuable part of GCC training. Sorties will
> be credited toward GCC levels.[11]

There is no mention of an opportunity for interface with the other
part of the combined arms team - the U.S. Army.

What about Air Support Tactics (AST), or close air support?
Are joint training benefits mentioned in the following definition?

> AST missions should be conducted with a slow,
> SCAR or ground FAC with or without ordnance
> expenditure in a tactical training area.[12]

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[10]Interview, LtCol James Piner

[11]TACM 51-50, p. 6-13.

[12]TACM 51-50, p. 6-14.

According to TACM 51-50, therefore, close air support training requires a FAC and possible ordnance expenditure. The supported forces are not required nor, according to TACM 51-50, are any benefits derived from working with U.S. Army ground forces. This then is in direct opposition to the philosophy underlying the development of the Chapter II close air support skill and knowledge requirements.

Obviously, joint close air support has not been eliminated because TACM 51-50 does not emphasize joint training. Joint close air support training missions and exercises are flown almost every day in support of U.S. Army Field Training Exercises (FTX's) and Army Training and Evaluation Programs (ARTEP's). For example, a review of the exercises supported by the Ninth Air Force Tactical Operations Directorate (DOJ) for the last three quarters of FY 78 reveals several training exercises in support of U.S. Army units and one with the Navy. The review also reveals a problem indicative of joint training exercises, inflexibility.

Air Force assets and especially those dedicated to exercises must be scheduled well in advance. This tends to create inflexibility in the USAF participants. Traditionally, U.S. Army units do not wish to be tied to a defininte time table. One division commander, when shown the draft of a message approving a joint close air support exercise that was to be held in conjunction with his FTX, stated he would not sign the message until he was assured the air support would not interfere with his ground exercise, "the tail would not wag the dog!" This feeling is probably prevalent throughout the Army today, but so is the feeling that air support is a vital part of the combined arms equation. The

solution is to realize that joint close air support training exercises
are extremely beneficial to all concerned. In the constrained peace-
time environment, both parties must be willing to make concessions. It
may take a firm schedule committment on the part of the Army, and it
may require the USAF element to devise alternate mission scenarios and
ground alert contingencies. A little more effort from both parties will
result in tremendous training benefits. We cannot afford to conduct
joint close air support training during the first battle of the next war!

Other well known forms of joint close air support training are
the large U.S. Readiness Command (REDCOM) type exercise such as "Brave
Shield" and the formal fire power demonstrations. Unfortunately, these
exercises are often too "canned" because of the large number of forces
involved and because of time and space constraints. The fire power
demonstrations often become nothing more than practice ordnance delivery
under very unrealistic conditions. By regulation, the deliveries must
be rehearsed exactly as they are to be flown, preferably with practice
ordnance and then with practice live ordnance before the "big show."
Because of the usual high level dignataries witnessing the demonstration
only the most highly qualified pilots are selected for these missions.
Consequently, realistic training is minimal, and the pilots who need the
experience the most are the ones who are left at home.

These joint missions do not achieve as much as the less structured
joint close air support training exercises mentioned earlier. The ob-
jectives must be to train together, learn together and make mistakes
together. If you cannot do the latter, you are not training, only
repeating.

If joint training is being accomplished, why is it necessary
to emphasize joint close air support training in TACM 51-50? The reason
is that not enough quality joint close air support training is being
accomplished. One of the reasons is budgetary constraints outlined in
the next chapter, but another is lack of emphasis. Until Tactical Air
Command puts the same level of emphasis on joint close air support
training as it does on other facets of the tactical air missions, then
the total integration of the combined arms team cannot be achieved.
Tri-Command Manual 3-1(S) contains the lessons learned from previous
conflicts, but as the Joint Air Attack Team experience has shown, new
tactics develop from an interchange of ideas. That interchange is
sharpest in the joint arena at the "operator" level.

CHAPTER V

UNIT TRAINING PROGRAM ACCOMPLISHMENT

<u>GENERAL</u>

So far in this study, close air support has been viewed from a historical perspective and in relation to the modern battlefield. From the latter discussion specific skills and knowledge requirements were identified as essential for successful close air support on the modern battlefield. Next came an outline of the TACM 51-50 continuation flying training program for A-10 and A-7D pilots. This was followed by a comparison of the postulated modern battlefield close air support requirements with the actual sorties and events specified in TACM 51-50. It is now necessary to view the close air support training program from a unit perspective to see if there are any factors at the unit level which affect the conduct of the close air support training program. Much of this discussion is based on the author's personal experiences in tactical fighter wing operations and scheduling.[1]

There are many criticisms of the manner in which the TACM 51-50 flying training program has been implemented by the Tactical Air Command. The original program instituted in October 1977 left much to be desired and caused tremendous confusion in many units. It is unnecessary to discuss the discrepancies in the original program because many were corrected in the 1 October 1978 revision of TACM 51-50. Nevertheless,

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[1]The author was assigned to the 23TFW England AFB, La. from 1974-78 where he served as both a squadron flight commander and Chief of the Wing Current Operations Division (DOO). The division is responsible for the overall scheduling of the unit's flying training program.

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three months after publication, there were no less than five message changes to the 1 Oct 78 TACM 51-50 program. These changes disrupt the training continuity and cause subordinate units to doubt the managerial ability of the senior headquarters. As one Chief of Wing Operations and Training (DOT) remarked, "all I have been able to do is react."[2] This, of course, is a less than desirable situation. TAC must make every effort to insure all programs have been carefully reviewed and tested prior to field implementation. An urgent change designed to correct a dreadful wrong is often, in itself, more odious than the original wrong. If a revision to the training program is necessary, as it usually is in the dynamic military environment, then the revision should be held and consolidated with other desired changes to reduce the turbulence. These recommendations are not novel. They are generic to any sound administrative system.

There are many excellent and innovative features in the new program. For example, realism is strongly stressed. The program also introduced the concept of graduated training. Certain missions are acknowledged to be more difficult and complex than others and require a difficulty and complexity of training different from other missions. It also recognizes a "building block" approach to training. Everyone must have basic foundation. Once this foundation is established, then the more complex and difficult mission capability is achieved through additive training. The program also recognizes experience differentials and sets requirements based on two categories: inexperienced, and ex-

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[2] Wing Operations and Training Division (DOT) is the agency responsible for supervision of the wing's flying training program.

perienced pilots.[3] Of course, commanders can increase training as deemed appropriate for the individual or the unit.

Any detailed assessment of a unit's capability to meet its training requirements would necessarily impact on readiness ratings and, therefore, would be classified. It will suffice to say that all units involved in this study have always met or exceeded expected readiness standards. A discussion of a particular unit's difficulty in achieving a specific training requirement or standard is just that - a difficulty, and in some instances it is a minor inconvenience. Discussion of a difficulty does not imply the unit lacks that particular capability, it merely means the unit's acquisition of that capability was adversely affected by some external factor. Consequently all the 23TFW examples used in this chapter were experienced while maintaining the expected training readiness rating.

The foregoing discussion answers the primary question concerning a unit's ability to accomplish a training program and prepare for its mission. "Is the unit ready to perform it's mission?" The answer is yes. All active duty A-7D and A-10 wings (23TFWA-7D, 355 and 354TFW-A-10) are considered fully mission ready. But what difficulties, if any, have been experienced by the units in accomplishing the TACM 51-50 close air support training programs? Or what factors are adversely affecting the units?

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[3]A third category "highly experienced" was also proposed but never included.

FACTORS AFFECTING ACCOMPLISHMENT

All units are not blessed with ready access to the full spectrum of training facilities necessary for program accomplishment, especially weapons ranges. A unit may have a tactical and scorable gunnery range within a short distance of the base, but these complexes may lack an electronic warfare simulation capability. Conversely, a unit may have the full spectrum of training facilities available, but may have to share the facilities with several other units and agencies. For example, the 23TFW has Claiborne scorable gunnery range 10 miles from the base. The range is operated and scheduled by the 23TFW. Several other active, Reserve and National Guard units within the Loiisiana, Texas and Mississippi area also use the range, but they have not usurped large amounts of range time. The 23TFW also uses Peason Ridge tactical gunnery range. The Wing has constructed an excellent tactical target array on the range and has installed a TV Optical Scoring System (TOSS). The 23TFW schedules all USAF aircraft on Peason Range; however, the range is actually controlled by the 5th Inf Div (M) at Fort Polk, La. Joint use is governed by a Letter of Agreement between the two units. The Army conducts Nap of the Earth (NOE) helicopter training and maneuver unit field training in the areas surrounding the impact zone and uses the same impact zone for artillery firing. The Army activity naturally limits the amount of time available for USAF use of Peason Range. Other ranges in the local area include Razorback Range in Arkansas and Camp Shelby Range in Mississippi. These ranges are operated and scheduled by other agencies and are not always available to the 23TFW. Furthermore, these ranges are at the outer limits of the A-7D's unrefueled operating

radius thereby reducing range on-station time and consequently, sched-uling flexibility. The use of these ranges with an air-to-air refueling mission is the desired method; however, tanker availability restricted this option.

None of the ranges discussed so far possess an electronic warfare (EW) simulation capability. The closest EW range complex is located at Eglin AFB, Fla. The range is used by many units and requires precise scheduling coordination. 23TFW aircraft can use the range by one of three scheduling methods: fly with external fuel tanks from home-station down to Eglin, use the range at medium altitude and return to home-station; fly down to Eglin with a training munitions load, use the EW range and adjacent gunnery ranges at low/medium altitudes and land at Eglin for dearmament and servicing prior to returning home; and finally, fly the same type of mission as discussed above except instead of landing at Eglin, use in-flight refueling.

The second and third options are preferred over the first option because they combine ordnance delivery with EW to produce a realistic mission scenario. The inherent scheduling difficulties in the last two options are primarily: coordination with Eglin AFB personnel for dearm-ament and servicing support, and the availability and compatability of range tanker support. Consequently, in the 23TFW, accomplishment of these types of missions have been the exception rather than the rule.

Another factor affecting the training programs is airspace management. Low level training routes, general training airspace and gunnery range airspace are becoming more and more restricted. The in-creases in general and commercial aviation have dictated restrictive

aviation regulations and extensive justification for Military Operating Areas (MOA).[4] Realistic training requires airspace control procedures approximating wartime conditions. FAA procedures often constrain the use of certain tactics such as radio silent (no-communications) missions. Also, large scale training exercises usually require more airspace and control than necessary during everyday operations.

Units often find themselves constrained when attempting to inject realism into a scenario and when planning joint or composite force training. For example, one unit may wish to perform dissimilar air combat tactics (DACT) in an area with another unit. Normally, however, the "visiting" unit will not be able to use the same operating areas unless the unit is included in the FAA Letter of Agreement, or the radar coverage is provided by the USAF, thereby relieving the FAA of aircraft separation responsibility. This case actually occurred in 1977-78 when the 23TFW attempted to establish a DACT program with the Louisiana Air National Guard F-100 squadron in New Orleans. The proposed airspace was the Tibby MOA off the Louisiana coast. Approval for inclusion of the 23TFW in the Tibby MOA Letter of Agreement took over 6 months. This shows some of the problems encountered in establishing realistic unit training program.

FAA airspace management procedures are becoming more constraining and are being rigidly applied. The reason is the need for increased safety in the more congested CONUS airspace. Almost all tactical

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[4]MOA's now define all military training airspace not identified as other special use airspace such as Restricted and Warning Areas.

training today is conducted in a controlled environment, either under instrument flight rules or in special use airspace designed for such operations. The military is constantly under pressure to justify retention of that airspace. Requests to increase the amount of military use airspace are carefully scrutinized by state and federal officials, and are rarely approved without extraordinary justification.

Another important factor is ecology. Military operations are often restricted by ecological factors such as migratory bird flyways, fuel dumping procedures, supersonic flight prohibitions, and noise abatement procedures. Before any new program or procedure is established, the environmental impact must be assessed and under certain circumstances, publicly documented. For example, a unit proposing to begin an extensive night flying program must evaluate its effect on the local and base populace. A community accustomed to jet noise during the day will immediately notice prolonged night flying activity. Unless they have been alerted and the necessity for the night activity explained, the incidence of noise complaints will rise astronomically during the first few days of activity.

Another factor affecting unit training programs is the budget. This restriction is normally complementary in nature rather than having a singular impact on the training program. When other factors inhibit or restrict training accomplishment, units are often forced to look elsewhere for the training support. Returning to the 23TFW's Eglin EW range example will help to explain the budgetary constraint. To land at another base for armament and servicing support requires personnel and equipment compatible with that type weapon system. If it is an

A-7D or an A-10 then the base personnel must be trained in A-7D or A-10 servicing and armament procedures. Often this capability does not exist, or if it does, the supporting ground equipment is incompatable. Commanders will often dispatch a maintenance and munitions team to perform the "turn-around" because the host base lacks the capability, or the commander will dispatch the team for fear a minor maintenance problem will ground an aircraft at the base for lack of specialized support equipment or personnel. Dispatching personnel and equipment can cause a drain on scarce TDY funds. Proper budgeting procedures can prevent serious deficiencies; invariably, however, unforeseen circumstances will always arise to compete for TDY funds.

Other funding factors can impact on aircrew training. In the spring of 1978, the 23TFW wanted to obtain as much composite force training as possible.[5] Unfortunately, the Wing discovered the training required sending aircraft and personnel to other units and that meant expenditure of dwindling TDY funds. Consequently, the Wing offered to conduct a large composite force training exercise at England AFB. In other words, the Wing wanted the other aircraft to come to England rather than send Wing aircraft and personnel TDY. The surprise came when the Services Officer announced that since the exercise would create a large influx of TDY personnel, on-base quarters were insufficient and commercial contract quarters would have to be provided - a very large expense paid by the host Wing! This example points out some of the

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[5]Composite Force Training requires other weapon systems to simulate combat conditions and require thorough integration of command and control and tactic, eg. a force package composed of FAC's, F-4 in the air defense role, and A-10's in a strike role.

additional "hidden" costs that must be explored when a unit proposes to conduct an extraordinary, realistic training exercise.

The unit's training programs are affected by several factors acting singularly or synergistically: training support location and availability, FAA and state airspace management constraints, ecological considerations, and finally, budgetary problems. These factors adversely affect the unit's ability to accomplish the close air support training program as outlined in TACM 51-50. How a unit manages these factors directly contributes to the efficiency and effectiveness of its training program.

Good management procedures and good planning can lessen the impact of the above. One approach implemented in Ninth Air Force warrants discussion.

Headquarters Ninth Air Force formed an Operations staff agency (DOJ) to coordinate the efforts of the subordinate units in their attempts to accomplish Composite Force Training. The new agency schedules composite force training exercises in conjunction with a host wing. For example, if a unit desires to host a training exercise, Ninth Air Force DOJ would provide guidance as to necessary planning and coordination requirements. In addition, it would contact other units to inquire as to whether or not they would be able to participate. During the actual exercise, DOJ would provide observers or controllers. The forming of this staff agency has been very helpful, but the concept of centralized assistance needs to be taken a step farther. Numbered Air Forces, or some other appropriate supervisory agency, should become the central manager for the execution of the flying training programs.

As discussed earlier, there are several factors which restrict training accomplishment. By centrally scheduling the scarce training support resources, such as EW weapons ranges, AWAC aircraft, and aggressor aircraft, in Composite Force Training exercise packages, units would not have to unilaterally try to put together realistic training programs in wasteful competition with each other.

This concept must be further expanded to insure fighter wings are provided with the necessary funds to participate in the scheduled Composite Force Training programs. Quarterly scheduling and planning conferences could amalgamate all the individual program requirements, establish priorities, and build realistic, mutually beneficial Composite Force Training packages. Identified shortfalls would be reported to TAC by the execution manager rather than the wing, thus eliminating the unit tendency to "keep trying to do more with less." For example, in Ninth Air Force, the 23TFW could continue to host "Coronet Rouge" close air support Composite Force Training exercises. Other tactical units could be scheduled to participate in such a way as to complement their own training programs and maximize the Coronet Rouge training effectiveness. F-15's of the 1TFW could support the exercise and accomplish strike force tactics training, DACT in both defender and aggressor roles, and other requirements not possible without other type aircraft and support. Execution managers can thereby insure an equitable distribution of the training support resources. Instead of simply monitoring the unit training programs, the execution manager, in this case the Numbered Air Force, can play an active and sorely needed role as the central manager for flying training program execution.

The Ninth Air Force DOJ training program is still operating, but it is severely stifled from lack of adequate funding. It had hoped to sponsor six large scale exercises in FY 79 at a cost of $300,000. Unfortunately, TAC did not fund the program. The agency is still providing assistance but not at the desired level.

In spite of the factors detracting from training accomplishment, the units are successfully accomplishing the TACM 51-50 training programs and specifically the close air support training requirements. Proof of this fact is the continued high readiness ratings of the units. However, the adverse factors can be mitigated through central program management. This would preclude many of the inefficiencies encountered by the units in unilaterally trying to develop the realistic training programs envisioned in TACM 51-50.

CHAPTER VI

SUMMATION, CONCLUSIONS AND RECOMMENDATIONS

SUMMATION

Historical evidence indicates that close air support has not had a trouble free evolution. From its beginnings in World War I through World War II, Korea and Vietnam, the close air support mission has been performed well but usually only after a very turbulent start.

The next possible large scale military conflict will not forgive early stage, or first battle, mistakes in close air support. On the modern high intensity, high lethality battlefield, close air support is a vital element of the combined arms team. Based on the expected characteristics of the central battle, there are several postulated close air support skill and knowledge requirements deemed essential to mission accomplishment. These requirements must, therefore, be embodied in any close air support training program.

The current TACM 51-50 training program is an improvement over earlier tactical flying training programs. The actual TACM 51-50 close air support training program contains the mechanisms, sorties and events necessary to satisfy the modern battlefield close air support skill and knowledge requirements. It only lacks one very important aspect - emphasis on joint training.

The individual units have been accomplishing the TACM 51-50 training programs; however, there are several factors which have had a negative impact on the unit's ability to efficiently and effectively implement the programs. The factors are training support location and

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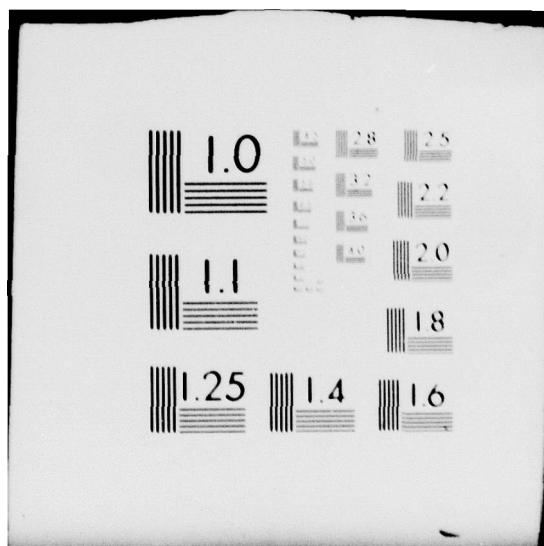
availability, FAA and state airspace management constraints, ecological considerations and budgetary problems.

Specific conclusions drawn about the factors affecting the unit's ability to accomplish the TACM 51-50 close air support training and the program's lack of emphasis on joint training follow each restated hypothesis. Recommendations and areas for further study are then presented.

CONCLUSIONS

Hypothesis 1: "The current TACM 51-50 flying training programs are based upon a modern high intensity battlefield scenario, but they do not adequately recognize the increased difficulty in performing the close air support mission as an integrated member of the combined arms team. Therefore, the training programs do not reflect adequate emphasis on joint training programs."

The TACM 51-50 close air support training programs are based upon the modern high intensity battlefield and do stress realism in all aspects of training. Furthermore, the type and distribution of sorties in the A-7 and A-10 TACM 51-50 training programs favorably align with the close air support skill and knowledge requirements derived from the expected characteristics of the modern battlefield. SAR sorties are not included at Proficiency Level A but are included in Level B and C. The single exception to the favorable sortie alignment is NBC operations. This very important requirement is not compatible with the TACM 51-50 sortie types nor does it receive any emphasis whatsoever.

The required events generally reflect an emphasis on task accomplishment rather than scenario accomplishment. Not all close air

support skill and knowledge requirements are included in Proficiency
Level A required events, but they are normally emphasized either in
Level B and C or elsewhere in the program. The events required only
in Levels B and C, however, may be vulnerable to sortie production
shortfalls and subsequent inability to advance to Level B and C.

Whether a requirement is made an event at Level A, Level B or
Level C or include in Chapter 6 of TACM 51-50 is a function of the de-
sired degree of emphasis placed on a particular requirement. The single
most important characteristic of close air support, namely its inte-
gration with the maneuver forces, receives no emphasis in TACM 51-50.
The natural benefits to accrue from joint training, such as JAAT, are
not recognized by TACM 51-50. Obviously, joint training is being accom-
plished, but not through emphasis from TACM 51-50. Consequently, the
findings of this study support the first hypothesis. The current TACM
51-50 flying training programs are based on a modern high intensity
battlefield scenario, and the program generally supports the close air
support skill and knowledge requirements necessary for mission accomp-
lishment. However, the joint nature of close air support is disregarded
and not emphasized in TACM 51-50.

Hypothesis 2: "Units are accomplishing the TACM 51-50 close air
support training but are not achieving maximum close air support proficiency
levels because TACM 51-50 lacks emphasis on joint training."

Units are successfully accomplishing the TACM 51-50 training
programs, and specifically, the close air support training requirements.
Proof of this fact is the continued high readiness ratings of the units.
This, however, has been achieved despite several factors which have

attempted to detract from optimum training accomplishment. These factors are: training support location and availability, FAA and state airspace management constraints, ecological considerations, and finally, budgetary problems. How a unit manages these factors directly contributes to the efficiency and effectiveness of its training program.

Regardless of these negative factors, units have been able to accomplish the TACM 51-50 close air support training programs. Optimum training, however, has not been achieved because of the factors mentioned above and the lack of emphasis on joint training highlighted in hypothesis 1. The findings of this study, therefore, confirm both hypothesis 1 and hypothesis 2.

RECOMMENDATIONS

Based on the conclusions drawn from this study, the following recommendations are offered for improving the current USAF close air support training program:

--NBC training should be included in TACM 51-50. The NBC environment is highly probable on the next battlefield and will have a direct impact on accomplishing the close air support mission.

--All Proficiency Level A required sorties and events should be reviewed to insure they are sufficient to accomplish the close air support mission in the event resource constraints do not permit advancement to higher Proficiency Level requirements.

--Joint close air support training must be emphasized. The joint aspect of close air support training is the integrating element that will assure close air support is a contributing member of the

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combined arms team. Furthermore, the U.S. Army must realize the benefit
of joint training and be prepared to accept some training degradation
in order to accomodate the often inflexible USAF participation in
training exercises. Joint training is not easy, but the benefits will
far outweigh its liabilities.

--Joint Air Attack Team (JAAT) tactics must be expanded to
include all close air support pilots, not just 25% of Mission Ready
A-10 pilots.

--To facilitate TACM 51-50 training accomplishment and, most
importantly, joint and Combined Force Training, program execution should
be centrally managed. This will prevent units from wastefully com-
peting with each other for scarce training resources. To this end,
joint and CFT programs similar to the one managed by Ninth Air Force
DOJ should be encouraged, supported and funded.

These recommendations form a foundation for improving the
TACM 51-50 close air support training program and insuring USAF close
air support is more than ready to fight and win the "first battle" as
a valuable member of the combined arms team.

GLOSSARY

GLOSSORY OF TERMS/ABBREVIATIONS[*]

AIR COMBAT TRAINING (ACBT) - A generic term which includes Basic Fighter Maneuvers (BFM)/Dissimilar Basic Fighter Maneuvers (DBFM), Air Combat Maneuvers (ACM)/Dissimilar Air Combat Maneuvers (DACM), Air Combat Tactics (ACT/Dissimilar Air Combat Tactics (DACT) and Defensive Counter maneuvering (DCM) where this is tasked in GCC training.

AGL - Above Ground Level

ALERT SCRAMBLE - See page 39

AIR SUPPORT TACTICS - See page 39

CIRCULAR ERROR (CE) - The miss distance of a given weapon impact expressed in radial distance from the center of the target.

COMPOSITE FORCE TRAINING (CFT) - See page 82

ELECTRONIC COUNTERMEASURES (ECM) - Training which enables aircrews to detect, avoid, degrade and/or interrupt the electronic surveillance, air defense and communication capability of opposing forces.

ELECTRONIC WARFARE (EW) - Military action involving the use of electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum and action which retains friendly use of the electromagnetic spectrum. EW is divided into the three categories: Electronic Warfare Support (ESM), Elect-

ronic Countermeasures (ECM), Electronic Counter-countermeasures
(ECCM). The majority of the aerial EW is ECM and ECCM.

EWR - Electronic Warfare Range

FULL SCALE WEAPONS DELIVERY (FSWD) - Normally requires the
delivery of a minimum of 3,000 lbs of live or inert ordnance
in a tactical mission scenario.

GRADUATED COMBAT CAPABILITY (GCC) - See page 38

HADB - High Altitude Dive Bomb

LAB - Low Angle Bomb

LALD - Low Angle Low Drag ordnance delivery.

LAS - Low Angle Strafe

LOW ALTITUDE TACTICAL NAVIGATION (LATN) - See page 41

LIMITED COMM MANEUVERING - See page 41

LOW LEVEL NAVIGATION TRAINING - Training events flown over
approved low level routes/areas.

MAVERICK MISSILE - AGM-65A is a launch and leave TV guided
air to surface missile. A "captive" missile is used for
training.

MR - Mission Ready

NAP OF THE EARTH (NOE) - U.S. Army Helicopter operations near tree top level following the earth's contour.

NM - Nautical Miles

POP-UP - A flying maneuver designed to position fighter/attack aircraft for weapons delivery following a low altitude ingress to the target area.

RADAR WARNING RECEIVER (RWR) - The term used to describe the use of on-board ECM and associated radar warning equipment to negate enemy air defense systems.

SAR - Search and Air Rescue.

SCENARIO - There are two types:

Intelligence Scenario. A description which includes Air Order of Battle (AOB), defenses, their locations and equipage and capability.

Training Scenario. A chronological description of a mission describing the events or training to be accomplished.

STRIKE CONTROL AND RECONNAISSANCE (SCAR) - A mission flown to acquire and report air interdiction targets and control air strikes against such targets.

SORTIE - A single sortie is one flight from takeoff to full stop landing.

SURFACE ATTACK TACTICS (SAT) - See page 41

TOT - Time Over Target

*The majority of these terms are from TACM 51-50 Chapter Seven

"Flying Training Abreviations, Terms and Associated Criteria."

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