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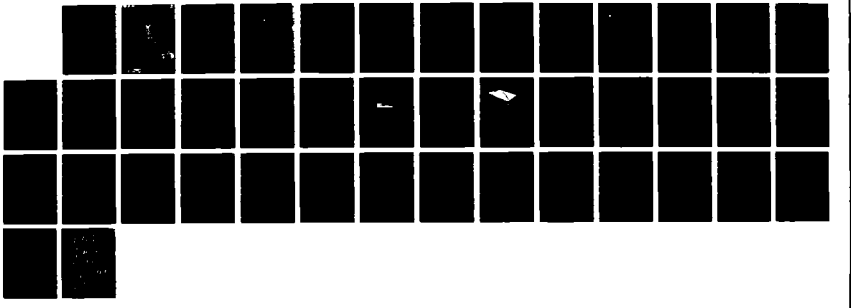

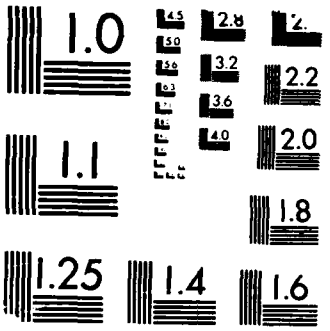

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AIR COMMAND AND STAFF COLLEGE

STUDENT REPORT

THE INTEGRATION OF US ARMY ELECTRONIC WARFARE CAPABILITIES IN J-SEAD OPERATIONS

MAJOR KENNETH L. TRAVIS 88-2590

"insights into tomorrow"

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This paper examines the operational requirements necessary to integrate US Army electronic warfare (EW) assets with US Air Force capabilities in joint suppression of enemy air defenses (J-SEAD) operations. It begins with a review of the recent joint initiatives between the Army and Air Force concerning the execution of AirLand Battle (ALB) doctrine. Next, the paper discusses J-SEAD planning considerations, to include descriptions of Army jammer systems, analysis of threat air defense systems and joint staff relationships. Execution considerations are then highlighted, focusing upon the four tenets of ALB--synchronization, agility, depth and initiative. The paper concludes with conclusions and guidelines for the joint staffer tasked with planning J-SEAD operations.

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PREFACE

The execution of AirLand Battle doctrine requires that the Army and Air Force integrate their respective warfighting capabilities on any future battlefield. To that end, the two services have established over thirty initiatives designed to enhance the timely employment of our joint forces. The ultimate goal is victory through the increased effectiveness of our combined forces. Using on one of these initiatives, the joint suppression of enemy air defenses (J-SEAD), as an example, this paper identifies and discusses the operational requirements necessary to integrate US Army electronic warfare (EW) assets with US Air Force capabilities. The target audience is the Air Force staff officer responsible for integrating available Army EW assets into his/her suppression planning. Army EW system capabilities, planning considerations and execution requirements are highlighted.

Subject to clearance, this manuscript will be submitted to the Airpower Journal for consideration. The paper's format, to include length, double spaced text and use of footnotes, is in compliance with the requirements of the journal.

ABOUT THE AUTHOR

Major Travis is a 1973 graduate of the United States Military Academy. He was initially assigned to the 1st Battalion, 39th Field Artillery, 18th Airborne Corps at Fort Bragg, North Carolina. While assigned to this 155mm howitzer battalion, he held positions as Assistant Executive Officer and Executive Officer in Charlie and Alpha Battery, respectively. In 1975 he attended the Rotary Wing Aviator Officer Course at Fort Rucker, Alabama, and upon graduation, was assigned to an aviation troop in the 11th Armored Cavalry Regiment, Fulda, West Germany. As Scout Platoon Commander, Command and Control Platoon Commander and Operations Officer, he was responsible for aerial surveillance of the East-West German border. Following this assignment, he returned to Fort Rucker where he served as a Flight Commander in the aviation school and as Programs Officer in the Directorate of Training and Doctrine. After completion of graduate schooling, Major Travis was assigned to the Air Force-sponsored Command, Control, Communications Countermeasures (C3CM) Joint Test Force (JTF) as a systems analyst. As Chief, Analysis and Simulation Division, he was responsible for all analytical work in support of a $100 million test program of US capabilities against threat C3 systems. Major Travis is currently attending the Air Command and Staff College at Maxwell Air Force Base in Alabama.

Major Travis is a Senior Aviator and has been awarded the Defense Meritorious Service Medal, the Meritorious Service Medal, the Army Commendation Medal, the Joint Service Achievement Medal and the National Defense Service Medal. He is a graduate of the Field Artillery Officer Basic and Advance Courses and the US Army Command and General Staff College. He holds master degrees from the Georgia Institute of Technology and the University of Southern California.

TABLE OF CONTENTS

Preface....iii
About the Author....iv
List of Illustrations....vi
Executive Summary....vii

CHAPTER ONE--INTRODUCTION....1

CHAPTER TWO--ELECTRONIC WARFARE SYSTEM CAPABILITIES
- The TRAFFIC JAM System....5
- The TACJAM System....7
- The QUICKFIX System....7
- The AN/GLQ-3B System....8
- The AN/TLQ-15 System....8

CHAPTER THREE--PLANNING CONSIDERATIONS....11

CHAPTER FOUR--EXECUTION CONSIDERATIONS....19

CHAPTER FIVE--CONCLUSIONS AND RECOMMENDATIONS
- Conclusions....23
- Recommendations....24

FOOTNOTES....27

BIBLIOGRAPHY....29

GLOSSARY....33

LIST OF ILLUSTRATIONS

TABLES

TABLE 1--Communications Jamming Resource Availability.....6
TABLE 2--Electronic Attack Options.....9
TABLE 3--J-SEAD Planning and Coordination Elements.....14

FIGURES

FIGURE 1--Soviet Tactical SAM Air Defenses.....12

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REPORT NUMBER 88-2590

AUTHOR(S) MAJOR KENNETH L. TRAVIS

TITLE THE INTEGRATION OF US ARMY ELECTRONIC WARFARE CAPABILITIES IN J-SEAD OPERATIONS

I. Purpose: To identify and discuss the operational requirements necessary to successfully integrate US Army electronic warfare (EW) assets into J-SEAD operations. Secondarily, to provide the Air Force staff officer a fundamental understanding of Army jammer system capabilities and limitations, and the joint coordination necessary to employ these assets on the battlefield.

II. Problem: The suppression of enemy air defenses is a critical combat mission which must be executed to facilitate the conduct of close and deep operations. The threat air defense system is far too dense and redundant to target each component for destruction. Those systems not targeted for destruction may be electronically suppressed. Given an understanding of Army jammer system capabilities and their tasking mechanisms, these systems can be integrated with Air Force capabilities to produce the maximum suppression effect on enemy air defenses.

III. Data: The Army's electronic warfare capabilities are centered around five different jammer systems in the HF/VHF frequency bands. These systems are capable of jamming enemy

SAM/AAA C3 networks throughout the corps' area of close operations (approximately 30 kms). Four of the systems are ground based, while the fifth, the QUICKFIX, is mounted in an EH-1H helicopter. This degree of mobility greatly enhances the flexibility required to mass the suppression effort at the desired time and place. In addition to communications jamming, the Army exercises a significant voice collection and direction finding capability which can assist in establishing jammer-target assignments after the enemy executes his ECCM procedures.

IV. Conclusions: The Army possesses a significant electronic warfare capability which, when incorporated with Air Force capabilities, can provide a mutually supporting and enhanced joint suppression of enemy air defenses. The biggest obstacle to the effective integration of these respective capabilities is the infrequent opportunity to exercise the joint staff coordination necessary to orchestrate the forces.

V. Recommendations: The US Army and US Air Force must train today as they will fight tomorrow--jointly. It is unsatisfactory, perhaps negligent, to wait until the next war to discover we can't bring all our collective combat power to bear against the enemy because we have not trained together. The suppression of enemy air defense is a most vital mission. Training opportunities such as GREEN FLAG, BLUE FLAG and the National Training Center should be exercised to the fullest extent possible. Joint staffs, to division/ASOC levels, should be fielded to provide a staff architecture reflective of combat operations.

Chapter One

INTRODUCTION

> There are not more than five musical notes, yet the combinations of these five give rise to more melodies than can ever be heard. There are not more than five primary colors, yet in combination they produce more hues than than can ever be seen. There are not more than five cardinal tastes--sour, acid, salt, sweet, bitter--yet combinations of them yield more flavors than can ever be tasted.
>
> --Sun Tzu, The Art of War[1]

Sun Tzu, in his discussion of Energy over two thousand years ago, accurately described the challenge facing the battlefield commander and staff planner. The manner in which the commander prosecutes the art of war is constrained only by the number and types of assets available and his imagination.

Today the operational commander has more assets available to wage war than ever before. AirLand Battle (ALB) doctrine requires the integrated employment of these joint assets to be successful. To this end, on 21 April 1983, the Chiefs of Staff of the Army and Air Force signed a memorandum of understanding (MOU) for the joint employment of ALB doctrine. The objective was to "provide operational commanders the most capable, flexible and mutually supporting enhanced mix of forces for joint execution of the AirLand Battle against enemy forces".[2] The ultimate goal is increased "combined effectiveness in ALB

operations".[3] This initial MOU became the cradle for over thirty joint initiatives, each established to enhance the synchronization and integration of Army and Air Force assets on the modern battlefield.

Of the thirty plus initiatives, initiative #15 addressed the joint suppression of enemy air defenses (J-SEAD). The objective of this investigation was to "determine the contribution of an effective SEAD campaign to the AirLand Battle...".[4] Ultimately, J-SEAD may prove to be one of, if not the most critical function on the battlefield. In many respects it is the cost of doing business--a necessary first step to the successful conduct of close and deep area operations. Basic guidance for the conduct of suppression missions is found in USREDCOM PAM 525-3/TRADOC TT 100-44-1/TACP 50-23, Joint Suppression of Enemy Air Defense (J-SEAD) Operations and the USA/USAF Agreement for the Joint Suppression of Enemy Air Defenses. These two documents provide the framework for the employment of Air Force visual/sensor target acquisition systems, fighter aircraft, Wild Weasels, airborne jammers and scatterable mines in conjunction with Army visual/sensor target acquisition systems, fire support, jammers, helicopter gunships and scatterable mines to suppress enemy air defenses.[5] The overall goal is the synchronization of available assets to achieve the initiative and permit successful ground and air operations. How, then, does the joint staff officer integrate the available Army and Air Force assets into an effective, mutually supporting force capable of suppressing enemy

air defenses?

The purpose of this article is to identify and discuss the operational requirements necessary to successfully integrate US Army electronic warfare (EW) jammer systems into J-SEAD operations. The target audience is the Air Force staff officer who requires a basic knowledge of the Army electronic countermeasure (ECM) systems at his disposal which may be integrated into J-SEAD operations. I do not mean to imply that Army planners at joint levels of command are incapable of executing their responsibilities, or that their Air Force counterparts must be subject matter experts in Army systems in order to execute detailed J-SEAD planning. However, if the capabilities of both services are to be effectively integrated into a mutually supporting operation, the joint staffer must have a working knowledge of all the assets available from <u>each service</u>.

The selection of electronic countermeasures as the focal point for discussion is not meant to prescribe any employment priority to this measure. In fact, the preferred and most frequently directed method of suppression may be the <u>destruction</u> of the enemy air defense network by Air Force tactical aircraft and Army artillery fires. The integration of Army EW assets was chosen for two reasons. First, because disruptive means are often employed less frequently than destructive measures, the planning and execution requirements of these systems are less apparent. Second, from the joint staff planner's perspective,

the incorporation of Army EW assets provides a generic vehicle which highlights the considerations which must be addressed when joint forces are employed. In analyzing the many factors involved in the employment of this single capability, the need for a coordinated, systematic approach to the orchestration of the combined forces becomes readily apparent.

Initially, this paper identifies the Army jammers available to the planner, discusses their capabilities and addresses the limitations they bring to the battlefield. Knowledge of the systems available is the first and fundamental step to the successful planning of effective J-SEAD operations. Next, joint planning considerations are discussed, emphasizing analysis of the target threat systems, assignment of appropriate jammer assets and the coordination demanded of a joint enterprise. Execution considerations are then highlighted, focusing upon the ALB tenets of synchronization, agility, depth and initiative. Finally, conclusions and recommendations are presented as guidelines for the joint staffer tasked with planning the J-SEAD operations of the next war.

Chapter Two

ELECTRONIC WARFARE SYSTEM CAPABILITIES

The military intelligence (MI) battalion (BN) is the Army organization resourced with the organic ECM assets necessary to wage electronic warfare against the enemy. At the corps level, the MI BN (Tactical Exploitation) is assigned to the military intelligence brigade (CEWI) in a general support role. At the division level, although normally assigned in a general support role, the MI BN (CEWI) may be deployed in direct support of brigade operations. Five types of jammer systems--TRAFFIC JAM, TACJAM, QUICKFIX, AN/GLQ-3B and AN/MLQ-15--are resourced to corps and divisions based upon echelon and division type. Communications jamming (COMJAM) resource allocations by echelon and division type are summarized in Table 1. The QUICKFIX is assigned to the division combat aviation brigade (CAB) but under operational control (OPCON) of the MI battalion for integration into combat operations. The basic operating characteristics and system capabilities of each are highlighted below.

The TRAFFIC JAM System

The TRAFFIC JAM system utilizes the AN/TLQ-17A jammer to disrupt the enemy's C3 network. Three jammer systems are assigned to corps and armored, mechanized and infantry divisions;

SYSTEM	CORPS	ARM/MECH DIVISION	INFANTRY DIVISION	AIR ASSAULT DIVISION	AIRBORNE DIVISION
QUICKFIX	0	3	3	3	3
TRAFFIC JAM	3	3	3	6	6
TACJAM	3	3	0	0	0
AN/GLQ-3B	3 (1)	0	3	3	0
AN/TLQ-15	3	0	0	0	0
TOTAL	9	9	9	12	9

NOTE: 1 The new light corps has three AN/GLQ-3B vice TACJAM.

Table 1. Communications Jamming Resource Availability[6]

six jammers are resourced to each air assault and airborne division. The AN/TLQ-17A system is a high frequency (HF)/very high frequency (VHF) jammer capable of handling 256 preprogrammed frequencies, 16 of which can be programmed in an automatic spot jamming mode of operation. In addition, friendly frequencies can be protected by locking out those critical frequencies which must be guaranteed the freedom to operate. The system is highly mobile, employing its omni-directional whip antenna from either a jeep, armored personnel carrier or commercial utility cargo carrier. The system may perform in a communications intercept or jamming role.[7]

The TACJAM System

The TACJAM system utilizes the AN/MLQ-34 jammer system to constitute the most powerful ground-based jammer in the Army inventory. Unlike the TRAFFIC JAM, the TACJAM is only resourced three each to corps, armored and mechanized divisions. The semi-automatic system is capable of jamming three VHF target frequencies simultaneously. A highly mobile system, the TACJAM is mounted on a tracked EW system cargo carrier and can be operational in a matter of minutes. Due to its high power output and directional antenna, it is frequently tasked to target emitters beyond the range of the TRAFFIC JAM system. Employed in concert with the TRAFFIC JAM, the TACJAM provides COMJAM coverage from the forward line of own troops (FLOT) to the division's deep operations areas.[8]

The QUICKFIX System

The QUICKFIX system, the AN/ALQ-151, utilizes the same jamming system as the TRAFFIC JAM--the AN/TLQ-17A. Three jammer systems are resourced to each type of division. They are assigned to the CEWI platoon of the division combat aviation brigade, but under OPCON to the MI battalion. The system capabilities are exactly the same in both jammers. The QUICKFIX is mounted in an EH-1H helicopter, providing significant mobility advantages over ground-based Army assets. The QUICKFIX system employs an omni-directional whip antenna providing 360 degrees of signal coverage.[9]

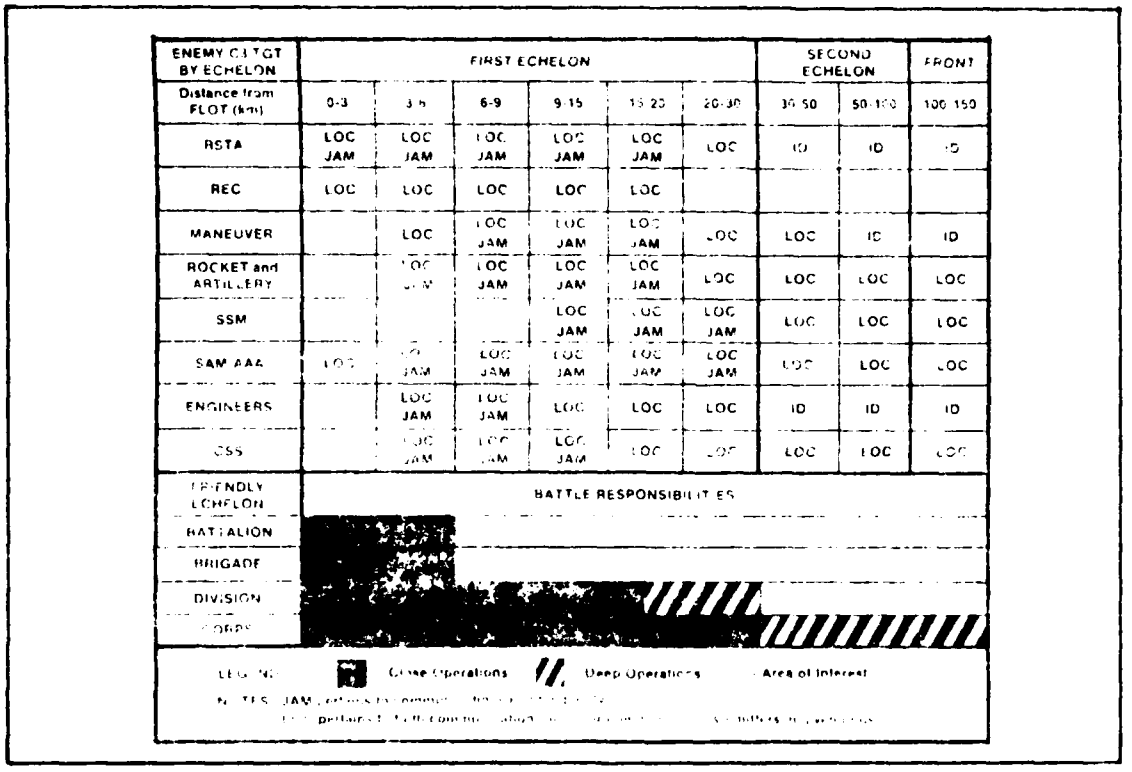
The AN/GLB-3B System

The AN/GLQ-3B is a single VHF frequency COMJAM system which was the predecessor to the TACJAM. The system is fielded three per corps, infantry and air assault divisions. A manual system, it has a directional antenna and high effective radiated power (ERP) which combine to make it more effective than TRAFFIC JAM against long range targets. This system incorporates a higher VHF frequency range than either the TRAFFIC JAM or TACJAM. Mounted in a wheeled vehicle, the AN/GLC-3B is normally deployed in the main battle area, behind the TRAFFIC JAM and TACJAM systems.[10]

The AN/TLQ-15 System

Although the AN/TLQ-15 is not assigned at the division level, this HF communications jammer is often attached to division MI battalions from corps to provide general support (GS). Each of the three systems assigned to Corps normally collocate with the AN/GLC-3B systems in the main battle area. This COMJAM system, using an omni-directional whip antenna, provides extended range for the attack of enemy HF C3 networks.[11]

The limitations of the jammer systems are based upon the fact that they were originally designed to support ground forces in close combat. Consequently, the systems were developed with power outputs and effective ranges only adequate to satisfy their intended purpose. USAF airborne jamming systems, as would be expected, are several times more powerful with comparably greater effective ranges. An additional limitation is the frequency band



ENEMY C3 TGT BY ECHELON	FIRST ECHELON						SECOND ECHELON		FRONT
Distance from FLOT (km)	0-3	3-6	6-9	9-15	15-20	20-30	30-50	50-100	100-150
RSTA	LOC JAM	LOC JAM	LOC JAM	LOC JAM	LOC JAM	LOC	ID	ID	ID
REC	LOC	LOC	LOC	LOC	LOC				
MANEUVER		LOC	LOC JAM	LOC JAM	LOC JAM	LOC	LOC	ID	ID
ROCKET and ARTILLERY		LOC JAM	LOC JAM	LOC JAM	LOC JAM	LOC	LOC	LOC	LOC
SSM				LOC JAM	LOC JAM	LOC JAM	LOC	LOC	LOC
SAM AAA	LOC	LOC JAM	LOC JAM	LOC JAM	LOC JAM	LOC JAM	LOC	LOC	LOC
ENGINEERS		LOC JAM	LOC JAM	LOC	LOC	LOC	ID	ID	ID
CSS		LOC JAM	LOC JAM	LOC JAM	LOC	LOC	LOC	LOC	LOC
FRIENDLY ECHELON	BATTLE RESPONSIBILITIES								
BATTALION									
BRIGADE									
DIVISION									
CORPS									

LEGEND: Close Operations // Deep Operations Area of Interest

NOTES: JAM ...

Table 2. Electronic Attack Options[12]

covered by Army ECM assets. Designed primarily to attack enemy tactical C3 networks, the COMJAM systems are incapable of disrupting ultra high frequencies (UHF). The electronic attack options are summarized in Table 2.

Chapter Three

PLANNING CONSIDERATIONS

TACP 50-23 prescribes three categories of J-SEAD operations: campaign, localized and complementary.[13] For the purpose of this effort, only localized J-SEAD operations will be focused upon. Objectives of localized J-SEAD are "to protect friendly aircraft conducting air operations, to allow friendly aircraft to operate in the low and medium altitudes, and to protect aircraft while transiting the FLOT".[14] The specific objective of this localized example is to execute a corridor suppression sufficient to allow the penetration of air interdiction assets and attack of second echelon forces. Many of the planning and execution considerations, although focused upon the hypothetical localized operation, are applicable to both campaign and complementary J-SEAD operations. The most basic foundation to any successful combat operation is a sound knowledge of the enemy--his strengths, weaknesses and vulnerabilities.

The Soviet integrated air defense system (IADS) is the most serious threat to the conduct of both air and combined arms operations. Based upon a doctrine emphasizing firepower, surprise, mobility and aggressive action, the Soviets have fielded an extremely lethal protective umbrella for their ground forces.[15] Opposing NATO in the central region of Europe, the

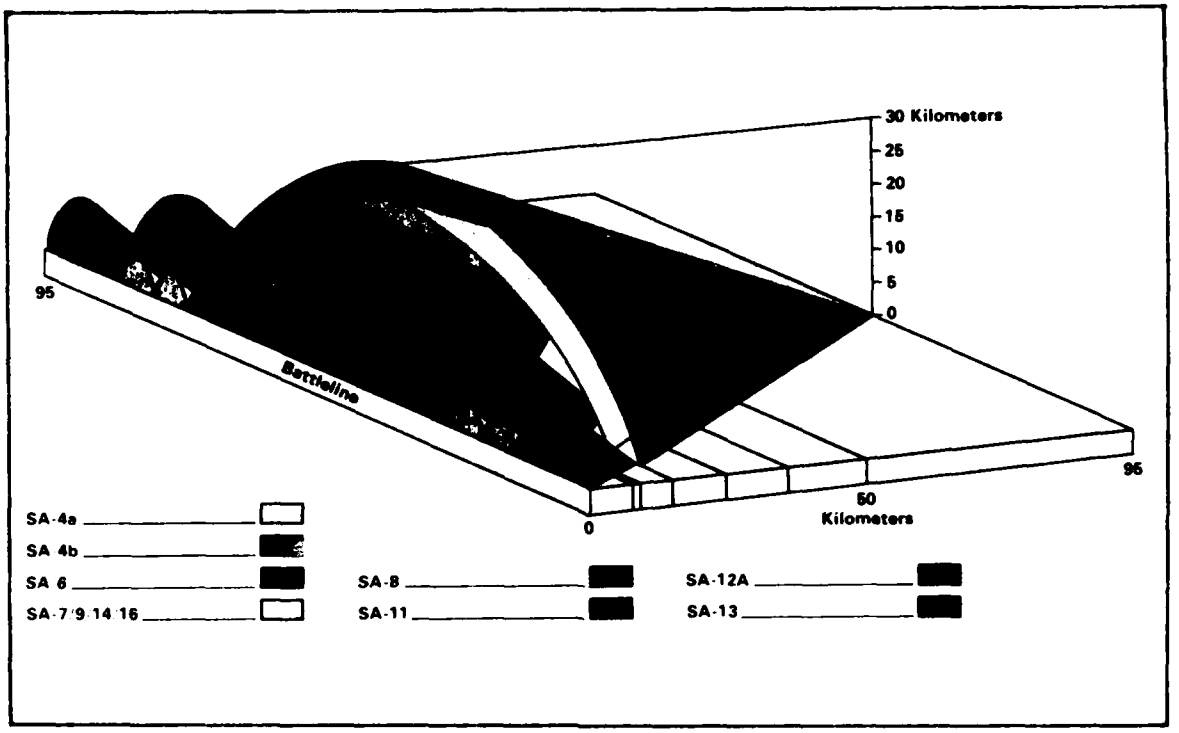


Figure 1. Soviet Tactical SAM Air Defenses[16]

Warsaw Pact has amassed 3,400 anti-aircraft guns and 2,200 surface-to-air missile (SAM) systems.[17] These assets are supplemented with extensive early warning and acquisition radars and redundant command, control and communications (C3) systems to form a highly effective air defense system which is employed the full width and depth of the battlefield. Figure 1 provides an illustration of the dense firepower available and is indicative of the protective belts the penetrating aircrew must negotiate to successfully attack the target.

To execute this doctrine and orchestrate the many assets of this complex air defense system, the Soviets incorporate a rigid system of command and control (C2). This highly centralized

system calls for the acquisition of incoming targets to be made at front and army levels, where long range acquisition radars are deployed. Weapon systems are selected and target assignments made by the chief of air defense and passed via radio or landline communications to the firing unit. The goal of this highly structured target assignment process is to enhance the survivability of the firing batteries by reducing their emission signatures. It is this rigidly structured C3 process that makes the Soviet air defense system vulnerable to EW attack during the execution of J-SEAD operations.

If this enormous array of mobile air defenses is to be suppressed, planners must concentrate our full combat potential against any identified weakness. Two such weaknesses are the Soviet communications and command and control functions.[18] The attack of these systems by ECM assets serves to disrupt the dissemination of specific target assignments and engagement instructions. Even the Soviets have admitted that "enemy jamming, both active and passive, of AD weapon control system presents a severe problem for AD troops".[19] The EW objective is to create mass confusion and indecision. If the flow of targets can be interrupted and firing units forced into a decentralized mode of control, the system effectiveness will be greatly reduced. The J-SEAD planners are responsible for orchestrating their forces to inflict sufficient paralysis on the enemy so as to reduce his overall effectiveness.

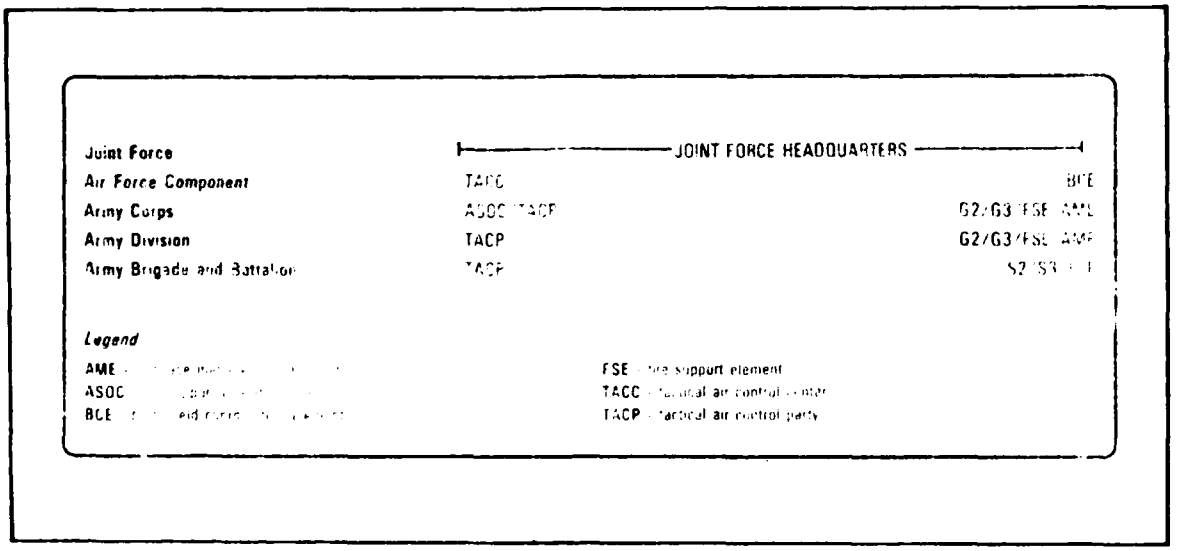


Table 3. J-SEAD Planning and Coordinating Elements[20]

The joint staff elements charged with the responsibility of planning and coordinating J-SEAD are depicted in Table 3. Upon receipt of the mission to be flown and supporting localized J-SEAD operations requirements, elements of the Tactical Air Control Center (TACC) rely upon the Army Battlefield Coordination Element (BCE) and liaison between the Air Support Operations Center (ASOC) and corps staff elements to plan and coordinate the necessary integration of Army EW assets into the mission planning process.

The planning process for the integration of EW assets mirrors that of non-electronic assets: mission analysis, threat assessment, analysis of friendly capabilities, development and analysis of courses of action, aircraft/weapon selection and post-mission effectiveness assessments. Air Force staffers at the TACC have at their disposal numerous Army capabilities to

enhance and facilitate the effective and efficient planning of the mission. Through coordination with the BCE and liaison between the ASOC and corps, the Army can assist in virtually every phase of the planning process.

The corps G2 is responsible for the intelligence preparation of the battlefield (IPB). This critical process of continuous analysis of the enemy, terrain and weather is pivotal to the establishment of the enemy order of battle. IPB provides the best intelligence estimate of the enemy's current capabilities, potential courses of action and the probability any single course of action will be adopted. This information is essential to a complete threat assessment and a valuable complement to organic Air Force intelligence functions.

If the electronic order of battle (EOB) is incomplete or more detailed data on threat dispositions are required, the G2 can task the All Source Analysis Center (ASAC) for additional information through the exercise of electronic support measures. The ASAC, in turn, will task the collection and analysis functions of the MI unit at the appropriate echelon to obtain the necessary information. This required data may include threat electronic signatures, emitter identities, operating frequencies and status, accurate locations and technical data for jamming operations. Based upon the complete threat assessment, target selection can be accomplished and courses of action established.

Given the detailed threat assessment and the capabilities of available assets, Army jammers are selected to supplement Air

Force systems in the development of the EW courses of action. The inclusion of Army assets into the EW plan is advantageous for several reasons. First and foremost, it allows the maximum combat power of both forces to be brought to bear against the enemy. If the J-SEAD operation is to be successful, every available resource must be applied. The Soviet command and control system is a potential weakness in the IADS which must be exploited with all means available. EW capability must not be held in reserve, but integrated in every operation to the extent of all available assets. Secondly, the integration of Army jammers insures the application of ECM against the enemy in the absence of available Air Force assets. The EC-130H Compass Call, one of the primary Air Force EW platforms, is a powerful jamming system capable of highly effective ECM against the C3 network of the IADS. However, because of its capability, it must be considered a high valued target from the Soviet perspective. If Compass Call is the only ECM asset tasked and is not able to function (attrition or mechanical failure), the C3 network will be allowed to operate unimpeded. The integration of ECM assets from both services increases the chance of at least a minimum degree of ECM against the Soviet C3. Finally, the tasking of Army assets against the enemy closest to the FLOT frees Air Force capability which can be directed against targets deeper into the battle areas. The greater range and power of the airborne systems are ideally suited for the attack of the deep IADS target.

Specific jammer assignments are established by identifying the targets and sending the request through the ASOC to the corps G3. Target information includes type, location, time and duration of jamming and coordinating aircraft information.[21] The corps G3 then directs the electronic warfare operations through his staff and the MI group (CEWI).

Upon ingress to the target area, the Soviet IADS will conduct electronic counter-countermeasures (ECCM) to escape the disruptive effects of the integrated EW attack. To continue the suppression effort through egress, ESM taskings will have to be made to ensure IADS operating frequencies are followed (should they shift frequency) and that ECM is continuously applied as the aircraft egress beyond the FLOT. These requests are passed through the ASOC to the G3 and subsequently to the G2 and ASAC.

The final opportunity for the integration of Army capabilities is in the assessment of the effectiveness of the J-SEAD operation. Collection and monitoring capabilities are again tasked through the ASOC-corps G3-corps G2 chain to make a determination of the effectiveness of ECM operations. This assessment of the effectiveness of the enemy's ECCM provides the basis for the modification of combined tactics and equipment in order to successfully counter the threat.

Chapter Four

EXECUTION CONSIDERATIONS

A detailed, comprehensive J-SEAD plan is of little value if it is poorly executed. The planning step is but half the requirement. On tomorrow's battlefield, combat plans will require aggressive, synchronized execution if we are to accomplish the mission and inflict our will upon the enemy. An operation's execution must be "rapid, unpredictable, violent and disorienting."[22] Army Field Manual (FM) 100-5, Operations, states that success on the AirLand battlefield can be characterized by four basic tenets: synchronization, agility, depth and initiative.[23] These basic tenets can also serve as execution objectives during the conduct of the J-SEAD operation.

More than any other factor, SYNCHRONIZATION of forces is an operational necessity in the execution of J-SEAD. Defined as "the arrangement of battlefield activities in time, space and purpose to produce maximum relative combat power at the decisive point",[24] synchronization is crucial to the successful integration of EW assets. Not only must the EW component be synchronized with maneuver, fire and air support, elements within the EW component must be orchestrated to achieve the maximum effect. Because the effects of ECM are transitory, the timing of their application is critical. Premature activation of a jammer

system compromises the principles of war of surprise and security and serves as a signal for the enemy IADS to initiate their ECCM. The Soviets then utilize their redundant communications to pass their targeting information. The objective must be to have the penetrating aircraft crossing the FLOT at the precise time the enemy is experiencing the disorienting and confusing EW and fire support effects. Synchronization allows the commander to capitalize upon the speed and maneuverability of his air assets to enhance strike package survivability and reduce attrition. An untimely or uncoordinated execution can spell disaster.

During execution of the J-SEAD operation, AGILITY is critical if friendly strengths are to be concentrated against the enemy's weaknesses. This becomes paramount during the period of time between ingress and egress. During this period, our agility--"the ability of friendly forces to act faster than the enemy"[25]--will in a large part determine the degree of suppression provided the egressing strike package. Once the strike package is ingressing to the target area, the Soviet command and control systems will coordinate their attack along the entire route of flight. During this period, intelligence functions must be initiated to monitor Soviet unit movements and identify and locate high value emitter operating frequencies to effectively integrate fire support and EW attack of the IADS C3. The Airborne Battlefield Command and Control Center (ABCCC) can facilitate the coordination and dissemination of target information and jammer data to both Army and Air Force forces.

The quickness with which these functions are performed will allow friendly forces to be concentrated against enemy vulnerabilities at the decisive point and time of egress. Agility requires a physical and psychological willingness to quickly respond to the changing battlefield situation. The survival of the strike force and our ability to fight tomorrow will be largely dependent upon this willingness.

In planning and executing the J-SEAD operation, the enemy must be attacked in DEPTH. The extension of the suppression effort in space, time and resources allows the friendly force to gain the momentum and achieve surprise.[26] This is accomplished by integrating Army EW assets nearest the forward edge of the battle area (FEBA) and tasking Air Force ECM platforms against targets beyond the FLOT where their greater range can disrupt the enemy C3 network. Attacking the enemy C3 network extends the depth of attack by disrupting the enemy's coordinated plans, reducing his freedom of action and increasing his autonomy. In this capacity, the attack is waged at a depth beyond that of friendly weapons.

Synchronization, agility and depth each support the achievement of INITIATIVE on the battlefield. Defined as "setting or changing the terms of battle by action,"[27] J-SEAD operations retain the initiative through violent, offensive action. Once the enemy experiences the shock of the initial EW and fire support barrage, he is repeatedly attacked by various platforms and systems to keep him off balance and confused. The

objective becomes to maximize his fog and friction. For example, if the initial EW attack on the enemy's C3 network forces him into a decentralized mode of control, anti-radiation and precision-guided munitions are used against the acquisition radars at the firing units. Initiative requires that the enemy's reaction to the suppression effort be anticipated, and events planned to counter his actions. All such actions are executed with a tempo, audacity and concentration which leaves the enemy incoherent and unable to orchestrate his forces.

Chapter Five

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

As a critical component of the counterair mission, J-SEAD will play a pivotal role in the ability of friendly forces to execute Airland Battle doctrine in the next war. A successful J-SEAD operation reduces attrition, destroys and disrupts the enemy force and provides the joint force commander (JFC) a degree of freedom to prosecute the war the full depth and width of the battlefield. However, the enemy force we will encounter in the next war will be vastly different from our recent combat experiences.

Unlike the air defense threat encountered in Vietnam, the laydown in a Central European scenario constitutes a highly lethal, redundant and mobile opposition which provides an effective air defense umbrella. The thousands of SAM/AAA sites and radar facilities are too numerous to engage individually. However, an identified weakness of the Soviet IADS is the command and control and communication systems. This vulnerability is an area of potential exploitation by joint EW operations.

If friendly forces are to defeat such a dense threat, the joint staff planner must integrate all the resources available into a comprehensive, coordinated plan. This requires a working

knowledge of available Army EW assets and their capabilities as well as their limitations. Armed with such knowledge, the planner must then incorporate these assets into an integrated EW plan in support of the J-SEAD operation. It is also important that he coordinate with his Army staff liaison to ensure the feasibility of the plan. The available Army EW assets should be included in the J-SEAD at every opportunity. The ECM and ESM functions provided to this operation by Army capabilities can enhance the planning and execution phases of suppression operations.

Recommendations

If the Army and Air Force are to fight jointly on tomorrow's battlefield, then we must train jointly today. If we wait until the third day of the next war to realize we can't plan and coordinate joint suppression operations, men will have died unnecessarily. This requires that training opportunities such as GREEN FLAG, BLUE FLAG and the National Training Center (NTC) are exercised to the fullest extent possible. As a minimum, joint staff representation down to division level is necessary to provide a staff architecture reflective of combat operations. Army EW assets must be deployed to the field to exercise the synchronization and agility necessary to sustain the operation. The planning and coordination must be practiced until the process becomes routine.

Equipment and hardware should continue to be developed in accordance with the joint force development process. New jammers

and communications equipment must be coordinated between the services to identify duplications of effort and deconflict areas of operational interference. Communications systems should be fielded which enhance the integration and employment of joint capabilities.

Finally, if the threat is to be countered, we must devote our joint constructive capabilities to explore the development of new tactics. As Sun Tzu indicated over 2500 years ago, the Energy brought to the battlefield is constrained only by our collective imagination. It is a weapon which no enemy can effectively counter.

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GLOSSARY

AAA	antiaircraft artillery
ABCCC	airborne battlefield command and control center
AD	air defense
ALB	AirLand Battle
ASAS	all source analysis system
ASOC	air support operations center
BCE	battlefield coordination element
BN	battalion
C2	command and control
C3	command, control, and communications
CEWI	combat electronic warfare and intelligence
COMJAM	communications jamming
ECCM	electronic counter-countermeasures
ECM	electronic countermeasures
EOB	electronic order of battle
ESM	electronic support measures
EW	electronic warfare
FEBA	forward edge of the battle area
FLOT	forward line of own troops
FM	field manual
G2	Assistant Chief of Staff, Intelligence
G3	Assistant Chief of Staff, Operations
GS	general support
HF	high frequency
IADS	integrated air defense system
IPB	intelligence preparation of the battlefield
J-SEAD	joint suppression of enemy air defenses
MI	military intelligence
MOU	memorandum of understanding
NATO	North Atlantic Treaty Organization
OPCON	operational control
PAM	pamphlet

CONTINUED

TACC	tactical air control center
TACP	tactical air control party
TRADOC	US Army Training and Doctrine Command
UHF	ultra high frequency
USA	United States Army
USAF	United States Air Force
USREDCOM	United States Readiness Command
VHF	very high frequency

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