United States General Accounting Office

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Report to Congressional Requesters

January 2001

ELECTRONIC WARFARE

Comprehensive Strategy Needed for Suppressing Enemy Air Defenses

GAO-01-28

GAO
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United States General Accounting Office
Washington, D.C. 20548

January 3, 2001

The Honorable Curt Weldon
Chairman, Subcommittee on Military
Research and Development
Committee on Armed Services
House of Representatives

The Honorable Bob Smith
United States Senate

The U.S. armed services must suppress enemy air defenses to be able to accomplish their war fighting objectives and survive.[1] To achieve this suppression, the services use specialized aircraft designed to neutralize, destroy, or temporarily degrade enemy air defense systems through either physical attack or electronic warfare. Specialized aircraft use electronic warfare devices, called jammers, to temporarily suppress enemy air defenses by transmitting electronic signals that disrupt enemy radar and communications. Other specialized aircraft use anti-radiation missiles that home in on radar used by surface-to-air missile or anti-aircraft artillery systems to physically degrade or destroy them. Because suppression aircraft are charged with protecting all of the services' aviation assets in hostile airspace, the suppression mission necessarily crosses individual service lines.

You have expressed concern that a 1996 decision to retire the Air Force's EF-111 and F-4G suppression aircraft, combined with a growing threat from increasingly sophisticated enemy air defenses, has created a gap between the services' suppression capabilities and their needs.[2] This report responds to your request that we (1) describe the actions the services have taken since 1996 to improve their capabilities for suppressing enemy air defenses and (2) evaluate the services' plans for eliminating any gap between their suppression capabilities and needs.

[1] The suppression of enemy air defenses mission increases U.S. air forces' ability to accomplish other missions by reducing their vulnerability to air defense missiles or guns.

[2] By May 1998, all of the Air Force's EF-111 and F-4G suppression aircraft had been retired.

Results in Brief

Since 1996, the services have taken some actions to restore suppression capabilities lost through the retirement of the EF-111 and F-4G aircraft, mainly by increasing the number of Air Force F-16CJ and Navy/Marine Corps EA-6B suppression aircraft. These aircraft, together with their electronic warfare equipment and high-speed anti-radiation missiles, provide limited capability against sophisticated enemy air defenses. To enhance this capability, the Air Force is improving the performance of the F-16CJ's targeting system. In addition, the Navy is upgrading the electronic warfare equipment on the EA-6B to improve its radar jammer performance and is working on improvements to increase the effectiveness of the high-speed anti-radiation missile. Also, the Navy is conducting a study—scheduled for completion in late 2001—to determine the most cost-effective alternatives for the future. Alternatives being considered include modifications to manned and unmanned aircraft for replacement of the EA-6B by 2015.

According to a 1998 study conducted for the Office of the Secretary of Defense and the Joint Chiefs of Staff,[3] the services have not adapted to the evolution of enemy air defenses from fixed, stand-alone radar systems that could be easily suppressed to integrated air defenses incorporating modern telecommunications links, passive sensors, and other sophisticated means of avoiding suppression.[4] In a follow-on 1999 study, also conducted for the Joint Chiefs, the services were found not to have the quality or quantity of systems necessary to protect their aircraft across the full range of military operations.[5] Successfully addressing the evolving threat, according to these studies, will require innovative suppression solutions utilizing multiple technologies and cutting across individual service lines. We found that the Air Force's and the Navy's efforts, while beneficial, do not reflect a comprehensive, cross-service approach. Despite their interdependence in carrying out the suppression mission, the services act on an individual

[3] Coleman Research Corporation, Arlington, Virginia, conducted this study for the Office of the Assistant Secretary of Defense (Science and Technology) and the Joint Chiefs of Staff between June 1996 and March 1998.

[4] Integrated air defense systems use modern telecommunications equipment and computers to create networks of early warning radar, targeting radar and passive detection equipment that pick up aircraft communications or engine heat or other means to track and target aircraft.

[5] The Department convened a special Joint Suppression of Enemy Air Defenses Integrated Product Team, sponsored by the Joint Chiefs of Staff, to conduct this assessment.

basis to define and prioritize suppression requirements and to develop, manage, and fund solutions to those requirements. Within the Department of Defense, no comprehensive, cross-service strategy for closing the gap between the services' suppression capabilities and needs exists—and no coordinating entity has been tasked with preparing such a strategy—to identify, among other things, suppression mission objectives, needed solutions, funding, timelines, and mechanisms to track progress. Consequently, service-level decisions are, in our view, much less likely to reflect the needed priority for closing the gap and to be the most cost-effective solutions for the Department overall.

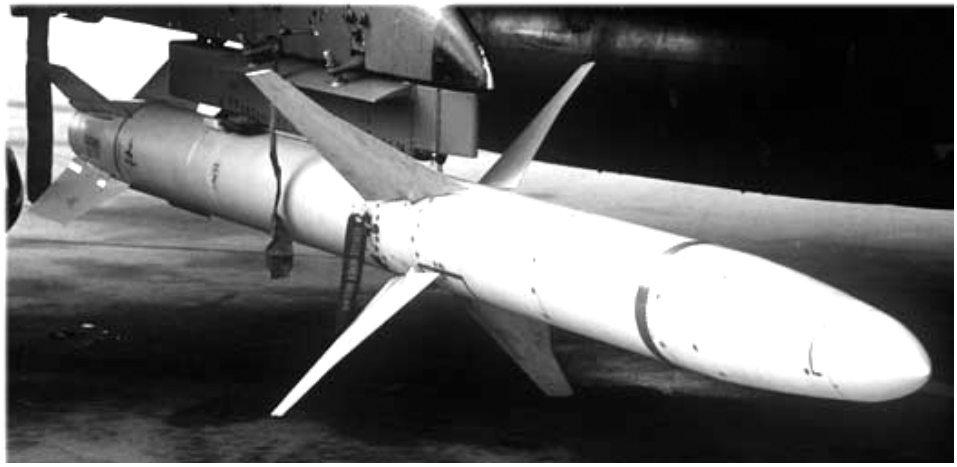
We are recommending that the Secretary of Defense designate a coordinating entity, including officials from each of the services, to develop a comprehensive cross-service strategy to close the gap between the U.S. armed services' suppression capabilities and their needs and to evaluate progress toward achieving the suppression objectives. In comments on a draft of this report, the Department agreed with our findings but disagreed with our recommendation. It maintained that it is already addressing some shortfalls, citing as evidence, for example, the ongoing upgrade efforts described in this report. Furthermore, the Department stated that it is performing a study—the ongoing analysis of alternatives—to underlie a Department-wide strategy for the suppression mission and that it will ensure the outcome of the study leads to a balanced set of acquisition programs between the services. We remain convinced that the Department is not likely to close the gap between suppression capabilities and needs without developing a comprehensive, cross-service strategy for doing so and assigning responsibility for this task to a coordinating entity. The ongoing analysis of alternatives is a necessary step, but a study is not a strategy. In disagreeing with our recommendation to designate a coordinating entity, the Department also expressed concern that such an entity may lead to the neglect of unique service requirements but added that any such authority should be staffed in a manner that allowed coordination of planning and explanation of those unique requirements. To address the Department's concern about the need for representation from the services, we revised our recommendation to include such representation.

Background

The United States experienced heavy aircraft and aircrew losses to enemy air defenses during the Vietnam War. Since then, the services have recognized air defense suppression as a critical component of air operations. Consequently, when a crisis arises, suppression aircraft are

among the first to be called in and the last to leave. Suppression aircraft such as the now retired EF-111 and F-4G played a vital role in protecting other U.S. aircraft from radar-guided missile systems during Operation Desert Storm in Iraq. In fact, Air Force strike aircraft were normally not permitted to conduct air operations unless protected by these suppression aircraft. The EF-111 was equipped with transmitters to disrupt or "jam" radar equipment used by enemy surface-to-air missile or anti-aircraft artillery systems. The F-4G used anti-radiation missiles that homed in on enemy radar systems to destroy them (see fig. 1).

Figure 1: AGM-88 High-Speed Anti-Radiation Missile



Source: U.S. Air Force.

Since the end of Desert Storm in 1991, U.S. suppression aircraft have been continuously deployed in support of Operations Northern and Southern Watch protecting fighter aircraft maintaining the no-fly zones over Iraq. In 1999, during Operation Allied Force in Yugoslavia and Kosovo, EA-6B suppression aircraft (see fig. 2) carrying electronic jamming equipment and anti-radiation missiles were extremely important for protecting strike aircraft from enemy radar-guided missiles.

Figure 2: EA-6B Prowler

Source: U.S. Navy.

Radar is the primary means used by enemy forces to detect, track, and target U.S. aircraft. Hence, U.S. suppression aircraft focus on trying to neutralize, degrade, or destroy the radar equipment of an enemy's air defense system. Enemy radars in the past were often fixed in position, operated in a stand-alone mode, and turned on for lengthy periods of time—all of which made them relatively easy to find and suppress through electronic warfare or physical attack.

U.S. suppression aircraft, using missiles and jammers, begin suppressing enemy air defenses after they begin emitting radio-frequency signals. At some risk to the aircraft and aircrew, the suppression aircraft must also be in the vicinity of the enemy air defenses to complete their mission. In response to this suppression capability, according to the Department, countries have been seeking to make their air defenses more resistant to suppression. These efforts include increasing the mobility of their surface-to-air missiles and radar equipment (see fig. 3), connecting radars together into networks, and adding sophisticated capabilities so that the radar can detect aircraft while turned on for shorter periods of time.

Figure 3: Mobile SA-6 Surface-to-Air Missile System

Source: Federation of American Scientists.

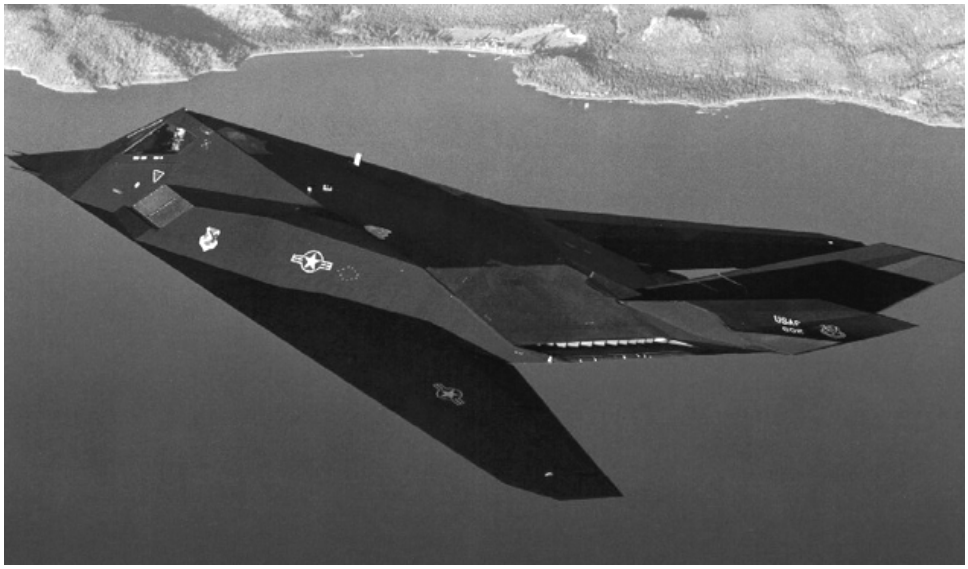
Additionally, many nations, including some hostile to U.S. interests such as Iraq and North Korea, operate what is referred to as integrated air defense systems. These systems use various means to track and target aircraft, including modern telecommunications equipment and computers to create networks of early warning radar, missile system radar, and passive detection systems that pick up aircraft communications or heat from aircraft engines.[6] Integrated networks provide air defense operators with the ability to track and target aircraft even if individual radar elements of the network are jammed or destroyed.

During Operation Allied Force in 1999, according to the Defense Intelligence Agency, U.S. suppression aircraft faced Yugoslavia's integrated air defense system and experienced significant difficulty trying to destroy it, as Yugoslav forces often engaged in elaborate efforts to protect their air defense assets. These protective efforts allowed Yugoslav forces to thwart many attacks, but they also reduced Yugoslav opportunities to track and

[6] Alternatives to radar for tracking aircraft include electro-optical, infrared, laser, and passive means.

engage U.S. and coalition aircraft because their air defense assets could not be utilized and protected simultaneously. Nevertheless, Yugoslav forces managed to shoot down an F-117 stealth fighter (referred to as stealth because it is harder to detect with radar) (see fig. 4) and an F-16CJ on a suppression mission. (Specific details about the two aircraft losses and tactics used by Yugoslav forces to avoid destruction are considered classified by the Department.) In addition to the two losses, the inability of the U.S. to destroy the Yugoslav air defense network forced the U.S. to (1) fly its strike missions at higher altitudes to reduce risk; (2) fly thousands of dedicated suppression missions, pushing its EA-6B force in Europe to its limits; and (3) keep many low-flying aircraft, such as the Army's Apache attack helicopters, out of combat.

Figure 4: F-117 Stealth Fighter



Source: U.S. Air Force.

At one point in time, advocates of acquiring more stealth aircraft believed that the Air Force's successful fielding of F-117 fighters and B-2 bombers would allow the services to reduce their suppression aircraft requirements. However, the loss of the F-117 over Yugoslavia in 1999 demonstrated that stealth aircraft could also benefit from improved suppression capabilities. Moreover, even if stealth aircraft required no suppression support, and even if the services do introduce more of them in the future, the majority of

the aircraft in the U.S. fleet will not have stealth capabilities for many years and will still require suppression support.

The Services Have Taken Some Actions to Improve Their Suppression Capabilities

In 1996, we expressed concern about the decision to retire the Air Force's F-4G and EF-111 without comparable replacements.[7] Subsequently, the services realized that the decrease in their suppression capabilities had increased U.S. aircraft vulnerability and could potentially frustrate achievement of U.S. military objectives and prolong future conflicts. Therefore, since 1996, the services have taken a number of actions to improve their suppression capabilities. First, the Air Force is increasing the size of its fleet of F-16CJ suppression aircraft (see fig. 5), and the Navy and the Marine Corps are adding EA-6B suppression aircraft to help reverse the quantitative impact of the retirement of the EF-111s and F-4Gs.

Figure 5: F-16CJ Aircraft

Source: U.S. Air Force.

[7] See *Combat Air Power: Funding Priority for Suppression of Enemy Air Defenses May Be Too Low* (GAO/NSIAD-96-128, Apr. 10, 1996).

Although not comparable in capability to the F-4G it replaced, the Air Force F-16CJ has an electronic targeting system and is equipped with high-speed anti-radiation missiles to attack enemy radar. The Air Force is acquiring 30 additional F-16CJ aircraft to bring its total to 210. The Navy and the Marine Corps EA-6B is a modified A-6 strike aircraft outfitted with special electronic transmitters for disrupting radar and communications. The EA-6B can also fire anti-radiation missiles. The Navy has brought back from retirement 20 EA-6Bs to increase the total to 123 aircraft, of which 104 are available for combat operations. Recent operations in Yugoslavia, Kosovo, and no-fly zones in Iraq have required extensive use of Air Force F-16CJs and Navy and Marine Corps EA-6B suppression aircraft.

Second, the services are improving the electronic warfare and missile systems on these aircraft to enhance their limited capability against sophisticated enemy air defenses. The Air Force is upgrading the targeting system on the F-16CJ. The Navy is upgrading the radar jamming equipment on the EA-6B to improve its performance. The upgraded EA-6B equipment is scheduled to be fielded beginning in 2004 and to reach Initial Operational Capability[8] in 2005. The Navy and the Air Force are also working together on improvements to increase the effectiveness of the high-speed anti-radiation missile. (Further details about these upgrades are classified.)

Third, the Navy is conducting a study to determine the most cost-effective alternatives for suppression in the future. According to the Department, it is the most important electronic warfare study presently ongoing and has considerable resources being applied to it. Numerous options for augmenting the EA-6B starting in 2010 and replacing it by 2015 are being considered, including using a modified version of the Navy's new F/A-18 E/F aircraft equipped with electronic warfare systems, or making modifications to other manned or unmanned aircraft. According to the Department, the study will also identify deficiencies and/or limitations and seek corrective actions. It is scheduled for completion in late 2001.

Fourth, the Under Secretary of Defense for Acquisition, Technology and Logistics is conducting a Department-wide review of electronic warfare programs, which include suppression programs. The purpose of this internal review is to determine whether these programs are adequately managed, prioritized, and funded.

[8] Initial Operational Capability will be reached when the first EA-6B squadron equipped with the upgraded systems is ready to be deployed.

No Comprehensive Strategy Exists to Address Evolving Threats

Despite actions taken by the services since 1996, a gap remains between the services' current suppression capabilities and their aircraft's need for protection from sophisticated enemy air defenses. Without a comprehensive, cross-service strategy for addressing that gap and a coordinating entity charged with developing such a strategy and evaluating progress, it is unlikely that the actions needed to close the gap will be taken.

Current Suppression Capabilities Are Not Adequate

In the mid-1990s, the Joint Chiefs of Staff found in its Joint Tactical Aircraft Electronic Warfare Study that the services' suppression capabilities were diminishing while the proliferation and modernization of enemy air defenses were increasing. Recognizing this, in 1996 the Deputy Secretary of Defense directed that a Joint Suppression of Enemy Air Defenses mission area architecture study be conducted. The purpose of the study was to develop well-grounded bases for decisions regarding platform, weapon, and support system modernization and to explore new ways and means for conducting suppression operations.

The study, completed in 1998, found that the services had not adequately adapted to the evolution of enemy air defenses from fixed, stand-alone radar systems that could be easily suppressed to integrated air defenses incorporating modern telecommunications links, passive sensors, and other sophisticated means of avoiding suppression. It also found that maintaining an effective suppression capability will require the development of innovative and nontraditional solutions cutting across individual service and functional (e.g., suppression, reconnaissance, and command and control) lines.

The willingness to adopt innovative approaches has provided the armed services with large suppression dividends in the past. For instance, during Operation Desert Storm against Iraq in 1991, the U.S. launched unmanned aircraft as decoys from beyond the reach of enemy air defenses to cause the Iraqis to turn on their radar and/or fire, thereby revealing their positions to suppression aircraft so they could be attacked. These attacks were highly successful when the Iraqi air defense forces remained fixed in position with their radar sites emitting signals that could be tracked by anti-radiation missiles fired from U.S. suppression aircraft such as the F-4G and EA-6B. As demonstrated in Yugoslavia in 1999, however, these tactics cannot succeed if enemy air defense forces choose not to reveal themselves or move quickly after firing.

To address these shortcomings, the 1998 study envisioned the leveraging of advances in sensor and data link technologies to build a multifunctional U.S. suppression mission "network" in which loitering decoys and other unmanned aircraft, surveillance and reconnaissance aircraft, suppression aircraft, command and control aircraft, and strike aircraft are all interconnected by high-speed data links. Military commanders could then use this network to locate targets and launch coordinated Army, Navy, and Air Force attacks on the enemy air defense forces' positions.

According to the study, suppression weapon development is also ripe for innovation. Future weapons could include, for instance, unmanned loitering drones with high-explosive warheads waiting silently high above to dive on enemy air defense forces before they can fire, or precision-guided munitions or anti-radiation missiles fired from unmanned aircraft that track enemy air defense forces as they move. By using unmanned aircraft, the suppression mission controller could take risks that would be unacceptable using manned aircraft. The potential loss of the unmanned aircraft or decoys in these scenarios is far preferable to the risk the services face today of losing manned EA-6B and F-16CJ aircraft conducting suppression missions (such as the F-16CJ lost over Yugoslavia in 1999).

The results of the mission area architecture study also led to a follow-on mission needs assessment to identify suppression mission deficiencies and technological opportunities to address them. According to the mission needs assessment completed in 1999, the services' overriding suppression mission deficiency is that they do not have the quality or quantity of systems necessary to protect U.S., allied, and coalition air forces across the full range of military operations. In terms of technological opportunities to address these shortcomings, the assessment concluded that a mix of manned and unmanned aircraft and lethal and nonlethal weapons (e.g., anti-radiation missiles and jammers) will be required to meet current and future operational objectives.[9] To provide near-term relief until these new systems can be acquired, the mission needs assessment proposed the appointment of a single entity to conduct joint suppression mission experiments involving assets from air, land, sea, information, and space-based forces. The objective of these experiments would be to try to develop joint doctrine, tactics, techniques, and procedures to aid in the suppression mission.

[9] The Department today has no lethal or nonlethal weapons-equipped unmanned aircraft with which to conduct suppression missions.

No Comprehensive, Cross-Service Strategy Exists for Achieving Suppression Mission

Although Air Force and Navy suppression aircraft are charged with protecting all of the services' aviation assets in hostile airspace, suppression mission requirements are defined and prioritized by the individual services. Also, the material and nonmaterial solutions that address these requirements are developed, managed, and funded by the individual services. The services' ongoing decisions to add F-16CJ and EA-6B aircraft and to improve the EA-6B aircraft and the high-speed anti-radiation missile, while beneficial, do not reflect a comprehensive, cross-service approach to improving their suppression capabilities.

Within the Department, no comprehensive, cross-service suppression mission strategy exists that identifies, specifically,

- the suppression objectives, preferably measurable, to be achieved;
- the actions, including material and nonmaterial solutions, needed to achieve those objectives;
- special technologies to be developed;
- funding, timelines, and responsibilities; and
- evaluation mechanisms to track progress or signal the need for adjustments.

Also, while it tasked the Joint Chiefs of Staff with conducting the mission area architecture study and mission needs assessment, the Department did not give responsibility to the Joint Chiefs or any other entity for (1) developing a comprehensive strategy and (2) evaluating to what extent suppression mission objectives are being achieved.

Without such a strategy or coordinating entity, service-level decisions are, in our view, much less likely to reflect the needed priority or the most cost-effective solutions for the services overall. For instance, in July 1999, the Commanding General of the Army's 101st Airborne Division wrote to Army headquarters that, due to the retirement of the Air Force's EF-111 and the shortage of Navy EA-6B suppression aircraft, there were insufficient suppression assets to meet the Army's needs. He expressed concern that the lack of required suppression support and failure to degrade enemy air defenses could result in catastrophic losses of his soldiers and equipment. The Commanding General's proposed solution to this shortfall was for the Army to develop its own suppression mission aircraft.

Conclusions

Since retiring the EF-111 and F-4G, the Air Force and the Navy have been acquiring additional suppression aircraft to restore some lost suppression capabilities and have begun improving their existing suppression systems. However, recent studies have pointed to a number of suppression mission area deficiencies. In our view, the development of a comprehensive, cross-service strategy for suppressing enemy air defenses is the best—and, perhaps, the only—way to really know whether the services are successfully closing the gap between suppression capabilities and needs. And the designation of a coordinating entity would provide the necessary institutionalized leadership to develop a strategy and evaluate its implementation. Until the gap is closed, U.S. aircraft will remain vulnerable in future conflicts, possibly resulting in the loss of lives and expensive assets and forcing U.S. aircraft to continue modifying their tactics (as they had to do in Yugoslavia in 1999) to reduce their exposure to increasingly sophisticated enemy air defenses.

Recommendation to the Executive Agency

To significantly increase the likelihood that needed actions are taken to improve the ability of U.S. aircraft to suppress enemy air defenses, we recommend that the Secretary of Defense designate a coordinating entity, including officials from each of the services, to develop a comprehensive, cross-service strategy for closing the gap between the services' suppression capabilities and their needs and to evaluate progress toward achieving suppression objectives.

Agency Comments and Our Review

In written comments on a draft of this report, the Department of Defense agreed with our findings regarding shortcomings in suppression capabilities but did not concur with our recommendation. The Department maintained that the services are already addressing some shortfalls, citing as evidence, for example, the ongoing upgrades of F-16CJ and EA-6B aircraft and the high-speed anti-radiation missile as described in this report. Furthermore, the Department stated that the ongoing analysis of alternatives will underlie a Department-wide strategy and that it will ensure the outcome of this study will lead to balanced, joint suppression of enemy air defense acquisition programs between the services. In disagreeing with our recommendation to appoint a coordinating entity, the Department expressed concern that such an entity may neglect unique service requirements, but it also added that any such entity should be staffed in a manner that allows coordination of planning and explanation of those unique requirements.

Although the Department asserted that it would ensure that the outcome of the ongoing alternatives analysis would lead to a balanced program for addressing the shortfalls, it did not explain how it would do so. We remain convinced that the Department is not likely to eliminate the gap between suppression capabilities and needs without assigning responsibility to a coordinating entity to develop a comprehensive strategy and evaluate progress toward achieving suppression objectives. The ongoing analysis of alternatives is a necessary step, but a study is not a strategy. As emphasized in this report, a comprehensive, cross-service strategy would increase the likelihood that actions would be taken. Among other things, it would identify objectives, material and nonmaterial solutions, funding, timelines, and mechanisms to track progress in closing the gap. Regarding the Department's concern that the coordinating entity would neglect unique service requirements, we revised our recommendation to include representation from the services.

The Department's written comments are reprinted in appendix II.

Scope and Methodology

To describe the actions taken to improve the U.S. armed services' capabilities for suppressing enemy air defenses, we interviewed Office of the Secretary of Defense, Joint Chiefs of Staff, Air Force, and Navy officials responsible for electronic warfare requirements, EA-6B aircraft requirements, and F-16CJ aircraft requirements. We interviewed officials from the EA-6B, F-16CJ, and high-speed anti-radiation missile programs. We interviewed Defense Intelligence Agency officials and reviewed performance data related to the Department's current suppression capabilities and the capabilities of enemy air defense systems. To evaluate the services' plans for eliminating the gap between U.S. suppression capabilities and needs, we reviewed the results of the Department's Joint Suppression of Enemy Air Defenses Mission Area Architecture Study and follow-on Mission Needs Assessment and compared them to the actions taken by the Department to improve its suppression capabilities since 1996. To determine whether successful fielding of stealth aircraft has affected overall suppression requirements, we interviewed Air Force officials knowledgeable about stealth aircraft and stealth operations.

We conducted our work at Office of the Secretary of Defense, Air Force, Army, Marine Corps, and Navy locations. We visited requirements, acquisition, logistics, and testing offices of the military services; field commands and operating units; various program offices; government

organizations involved in developmental efforts or military studies; and contractor facilities. Specific locations we visited are listed in appendix I.

We performed our review from December 1998 through November 2000 in accordance with generally accepted government auditing standards.

We are sending copies of this report to Senator John Warner, Chairman, and Senator Carl Levin, Ranking Minority Member, Senate Committee on Armed Services, and Representative Floyd Spence, Chairman, and Representative Ike Skelton, Ranking Minority Member, House Committee on Armed Services. We are also sending copies to the Honorable Louis Caldera, Secretary of the Army; the Honorable Richard Danzig, Secretary of the Navy; the Honorable F. Whitten Peters, Secretary of the Air Force; and the Honorable Jacob Lew, Director, Office of Management and Budget. Copies will also be made available to others upon request. We are also sending copies of this report to other interested congressional committees. The report will also be available on our home page at http://www.gao.gov.

If you have questions, please contact me on (202) 512-4841. Major contributors to this report were Michael Aiken, Terry Parker, Charles Ward, and Neil Wickliffe.

R. E. Levin
Director, Acquisition and
Sourcing Management

Locations Visited During This Review

Office of the Secretary of Defense, Washington, D.C.

Joint Chiefs of Staff, Washington, D.C.

Headquarters Elements, Air Force, Army, Marine Corps, and Navy, Washington, D.C.

Defense Intelligence Agency, Washington, D.C.

Defense Advanced Research Projects Agency, Arlington, Virginia

Institute for Defense Analyses, Alexandria, Virginia

Center for Naval Analysis, Alexandria, Virginia

Naval Research Laboratory, Washington, D.C.

U.S. Central Command, MacDill Air Force Base, Florida

U.S. Joint Forces Command, Norfolk, Virginia

Air Combat Command, Langley Air Force Base, Virginia

U.S. 9th Air Force and 20th Tactical Fighter Wing, Shaw Air Force Base, South Carolina

Naval Air Systems Command, Patuxent River, Maryland

Marine Corps Warfighting and Development Division, Quantico, Virginia

U.S. Air Force Aeronautical Systems Center, Wright Patterson Air Force Base, Ohio

U.S. Air Force Air Armament Center, Eglin Air Force Base, Florida

U.S. Air Force Air Warfare Center, Nellis Air Force Base, Nevada

Naval Strike and Air Warfare Center, Fallon, Nevada

Naval Aviation Depot, Jacksonville, Florida

Warner Robbins Air Logistics Center, Robbins Air Force Base, Georgia

Electronic Attack Wing, U.S. Pacific Fleet, Naval Air Station Whidbey Island, Washington

38th Marine Air Control Group, Miramar, California

355th Operations Group, Davis-Monthan Air Force Base, Arizona

33rd Tactical Fighter Wing, 53rd Test Wing, Eglin Air Force Base, Florida

169th Air National Guard, McEntire Air Force Base, South Carolina

RAND Corporation, Santa Monica, California

Coleman Research Corporation, Alexandria, Virginia

Comments From the Department of Defense

OFFICE OF THE UNDER SECRETARY OF DEFENSE

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ACQUISITION AND TECHNOLOGY

15 NOV 2000

Mr. Louis J. Rodrigues
Director, Defense Acquisitions Issues
National Security and International
Affairs Division
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Rodrigues:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "ELECTRONIC WARFARE: Comprehensive Strategy Needed for Suppressing Enemy Air Defenses," dated August 30, 2000 (GAO Code 707389/OSD Case 2073).

The Department generally agrees with the GAO's conclusions regarding current shortcomings in suppression of enemy air defenses (SEAD) capabilities and agrees that SEAD is critically important in establishing and maintaining air supremacy. The Department is currently in the process of addressing its SEAD shortfalls. An Airborne Electronic Attack Analysis of Alternatives has been initiated to determine the capabilities required for support jamming in the future. This is the most important electronic warfare study presently ongoing, and considerable resources are being applied to it. It is intended to identify deficiencies and/or limitations and seek corrective actions and is to be completed by September 2001.

The Department does not concur, however, with the GAO's recommendation to establish a defense suppression advocate within DoD, for the reasons stated in the enclosure.

The Department appreciates the opportunity to comment on the draft report. Detailed comments for technical correctness and accuracy have been forwarded under separate cover.

Sincerely,

George R. Schneiter
Director
Strategic and Tactical Systems

Enclosure: Response to GAO Draft Report

RESPONSE TO
GENERAL ACCOUNTING OFFICE DRAFT REPORT "ELECTRONIC WARFARE: COMPREHENSIVE STRATEGY NEEDED FOR SUPPRESSING ENEMY AIR DEFENSES," DATED AUGUST 30, 2000
(GAO CODE 707389/OSD CASE 2073)

RECOMMENDATION: To help ensure that the individual Services are giving the needed priority to the suppression mission and are taking actions that meet the needs of the Department as a whole, we recommend that the Secretary of Defense designate a coordinating entity to serve as advocate for achieving the Department's overall suppression mission needs, and develop a comprehensive Department-wide strategy for eliminating the gap between U.S. air forces' suppression capabilities and those needs.

DOD RESPONSE: Non-concur. The GAO bases the conclusion that the Department's current suppression capabilities are not adequate on a review of a 1998 DoD suppression of enemy defenses (SEAD) mission study, a 1999 DoD follow-on mission needs assessment, and extensive interviews at 28 field locations. The Department generally agrees with the GAO's conclusion regarding current shortcomings in SEAD capabilities. However, the Department offers the following brief comments regarding current capabilities and the effects of centralization of SEAD planning and budgeting authority. First, the GAO recognized that DoD has increased the number of EA-6B Prowler aircraft in the fleet, but failed to comment on the effect of integration of USAF and USN crews in the EA-6B community. This integration has reduced the piecemeal nature of the Services' SEAD efforts. Second, the GAO failed to assess the expanding SEAD capabilities of the USN/USMC F/A-18 community and the improvements to the USAF F-16 High-Speed Antiradiation Missile (HARM) targeting system. The draft report ignores the USN's role in firing nearly half of the HARMs used in combat to date. It does not address the USN/USAF joint effort to develop and support the HARM missile. These capabilities must be factored into any conclusion regarding a SEAD capability gap. Thus, the gap may not be as pronounced as the GAO suggests.

Suppression of enemy air defenses is important in establishing and maintaining air supremacy, and electronic warfare (EW) plays a vital role. However, there are other contributors to SEAD such as precision munitions, standoff weapons, stealth, and information operations. Electronic attack is only one aspect of the overall SEAD effort. Since the EA-6B assumption of the EF-111 mission, suppression efforts have become more jointly associated. Integration of USN and USMC EA-6Bs in deployed USAF air expeditionary wings in several locations has facilitated joint suppression tactical development. Additionally, USN expeditionary EA-6B squadrons are staffed with USAF aircrew, which facilitates tactical suppression exchange.

The report neglects Navy EA-6B integration of the USQ-113 communication jamming system as a deployed EW system. Specifically, the EA-6B has integrated its weapon system with other EW platforms via the connectivity programs and also with other DoD communication jamming and surveillance assets, like the EC-130 Compass Call and RC-135 Rivet Joint, to become more efficient and an EW force multiplier. The report should acknowledge this capability.

The Department is already performing a study to underlie a Department-wide strategy for air defense suppression. The Airborne Electronic Attack Analysis of Alternatives (AEA AoA) currently being conducted will address many of the challenges for confronting enemy air defenses. The Department will ensure the outcome of the AEA AoA will lead to balanced JSEAD acquisition programs between the Services, thereby addressing the GAO contention that "there is no assurance that (1) Department-wide suppression requirements are being developed and coordinated, (2) the most cost-effective programs to address the gap between suppression capabilities and needs are identified and given funding priority, and (3) the suppression mission is being achieved."

The Department disagrees with the GAO recommendation to establish a defense suppression advocate within the Department of Defense. The GAO does not comment on how a centralized SEAD planning authority would address the differing Services' SEAD requirements. The centralization of SEAD coordinating authority may in fact lead to neglect of unique Service requirements. Any centralized SEAD authority would need to be staffed in a manner that allowed not only coordination of planning, but also full explanation of unique Service requirements.

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