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COMBAT IDENTIFICATION SYSTEMS

Changes Needed in Management Plans and Structure

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The military services are pursuing a number of solutions that should help reduce the occurrence of friendly fire incidents. One class of systems being pursued under Army and Navy led efforts are cooperative identification of friend or foe (IFF) question and answer (Q&A) systems. Because the services are approaching major decision points in the acquisition process for these systems, we reviewed their management plans and structures for cooperative IFF Q&A systems development and integration. We conducted this review under our basic legislative responsibilities and are addressing this report to you because we believe it will be of interest to your committees.

Results in Brief

The Army and the Navy have been pursuing cooperative IFF Q&A systems to help combat the problem of fratricide without having developed a cohesive management plan and structure. These systems could cost more than $4 billion. Currently, responsibility for the development of these systems is divided between the Army and the Navy. The two services have been pursuing systems based on different technologies without fully considering how and at what cost those systems will be integrated. For example, the Navy has developed a cost and operational effectiveness analysis (COEA) for air-to-air and ground-to-air systems, while the Army is just beginning to develop a COEA that will help determine what ground-to-ground and air-to-ground system(s) to pursue. The development of separate COEAs risks the development and procurement of systems that cannot be integrated, or at least cost effectively integrated, and may result in having to field two or more cooperative IFF Q&A systems on the same equipment. Moreover, it should be noted that a cooperative IFF Q&A system only enables the identification of friends having compatible and operating cooperative IFF Q&A systems.

In our prior report[1] on combat identification, we noted that the Army planned to begin production of its near-term millimeter wave cooperative identification system without an analysis of whether the system could be integrated into the mid- and long-term solution(s). At that time, we recommended that the Army not begin production of the near-term system until it had determined that the system could be integrated into the mid-

[1]Minimizing Friendly Fire: The Army Should Consider Long-Term Solution in Its Procurement Decision on Near-Term Needs (GAO/NSIAD-94-19, October 22, 1993).

and long-term solution(s). The Department of Defense (DOD) agreed that the integration of the near-term battlefield combat identification system into the long-term approach is an important consideration in deciding on the production of the near-term system. However, we recently learned that the Army plans to acquire more near-term systems than needed for a demonstration that is to be the basis for the near-term system production decision without the analysis recommended in our prior report. The Army plans to acquire an additional 115 near-term systems at a cost of about $23.4 million. Army officials informed us that only 45 of the additional 115 systems are required for them to accomplish their goals for that demonstration.

DOD and the Army are concerned about the affordability and cost-effectiveness of the near-term system, and it may never be fully fielded for these reasons. The Army's plan to acquire more near-term systems than necessary to reach a production decision and without a determination of whether the near-term system can be cost effectively integrated into the mid- and long-term solution(s) or whether they will be affordable for large-scale fielding risks wasting millions of dollars on a system that may never be procured.

Background

The friendly fire casualties and equipment losses suffered during Operation Desert Storm reilluminated an old problem, fratricide, and underscored the need for more effective means of identifying friendly and hostile forces, and neutrals and noncombatants on the battlefield (i.e., combat identification). Studies and incidents subsequent to Operation Desert Storm, such as the friendly forces shootdown of two Blackhawk helicopters over Iraq during Operation Provide Comfort, have reiterated the need for improved combat identification.

Combat identification has been defined as "the means to positively identify friendly, hostile and neutral platforms in order to reduce fratricide due to mis-identification and to maximize the effective use of weapon systems." The services are pursuing a number of solutions[2] to provide combat identification. They believe the solution will involve a "system of systems," one component of which will be cooperative IFF Q&A systems.

[2]The services are pursuing both materiel and nonmateriel solutions to help prevent fratricide. The materiel solutions include cooperative and noncooperative target identification systems of various types and systems to provide knowledge of the location of friendly, enemy, and neutral forces. The nonmateriel solutions include changes in training, tactics, techniques, and procedures. The services' cooperative IFF Q&A development efforts are, thus, a small part of a larger effort to combat the problem of fratricide.

In March 1992, the Joint Requirements Oversight Council approved a mission need statement for combat identification. That mission need statement requires positive, timely, and reliable identification of hostiles, friendlies, and neutrals; classification of foes by platform, class/type, and nationality; interoperability between services;[3] and interoperability with minimum civil air traffic control system requirements.[4] It states that the primary constraint is affordability.

A cooperative IFF Q&A identification is accomplished when a shooter/observer queries a target and the target answers with a reply identifying itself as a friend. A Defense Acquisition Board review conducted on August 14, 1992, and subsequent approval from the Under Secretary of Defense for Acquisition, gave (1) the Army the lead in battlefield combat identification (BCI) efforts, including cooperative systems for ground-to-ground and air-to-ground identification, and (2) the Navy the lead for air-to-air and ground-to-air cooperative identification systems. The Navy was charged with coordinating these efforts. Figures 1 and 2 depict the current breakdown of responsibility for cooperative IFF Q&A systems development.

[3]Interoperability with allies is not a requirement but is desired.

[4]The United States and Europe are moving to adopt a new civil air traffic control signal, Mode S. The services' current Mark XII IFF systems do not have Mode S capability. Since military aircraft must operate in civilian controlled airspace, the military will have to adopt some Mode S capability or face restricted airspace in peace time.

Figure 1: Army Area of Responsibility for Cooperative IFF Q&A Development

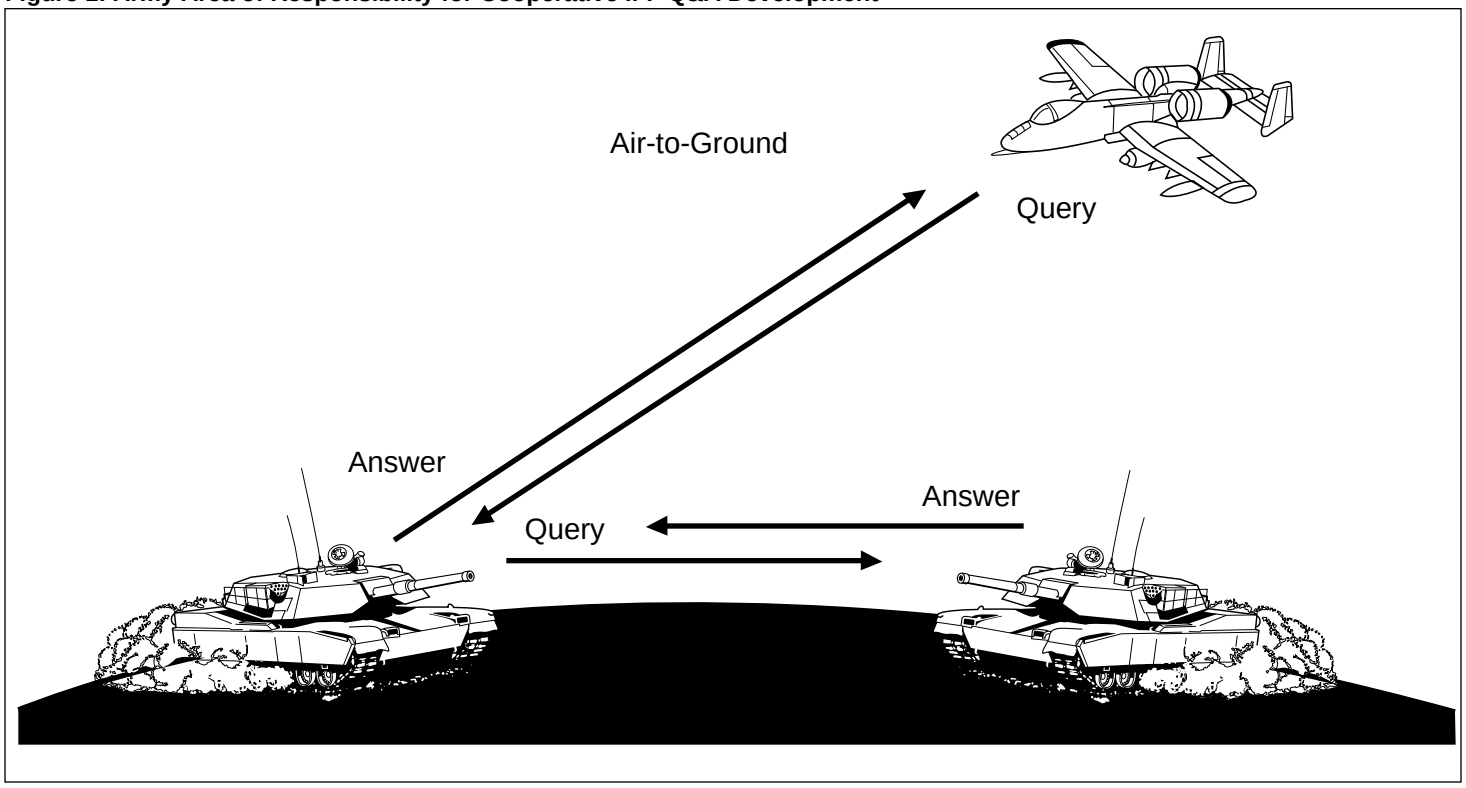
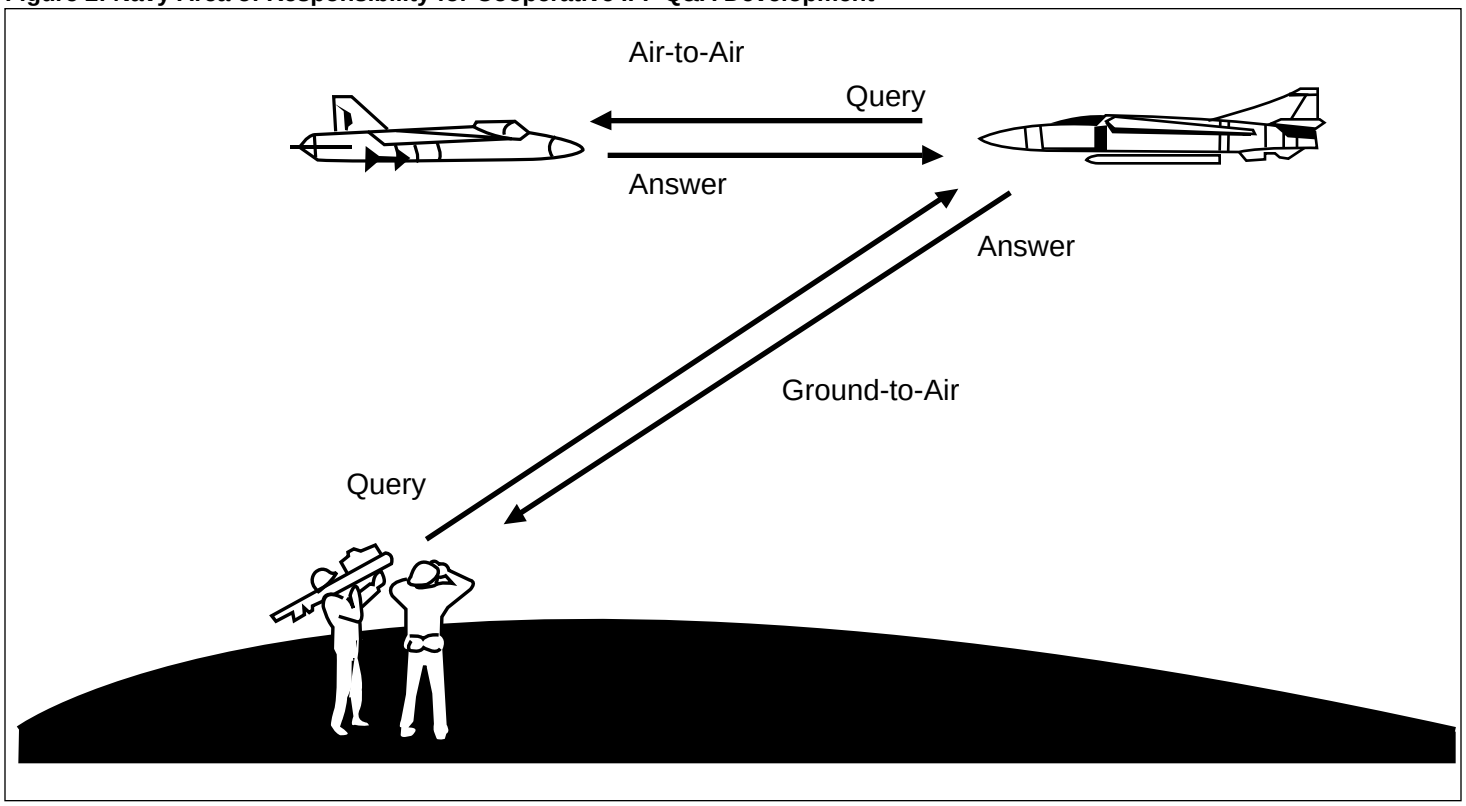


Figure 2: Navy Area of Responsibility for Cooperative IFF Q&A Development



Army's Efforts

To enhance force warfighting capability and minimize fratricide in the future, the Army has been pursuing a BCI[5] program to improve situational awareness and provide immediate, positive target identification. In 1991, the Army started implementing a five-phased program to develop and field battlefield identification techniques through fiscal year 2000. The Army is actively into the third phase[6] of the program, the near-term phase, whose objective is to integrate a battlefield combat identification system (BCIS) into selected ground vehicles and helicopters. A millimeter wave

[5]The Army determined that the term "combat identification" would encompass all antifratricide measures and would address situational awareness and immediate, positive combat target identification capabilities. Situational awareness is knowledge of the tactical environment, that is, knowledge of where friendly, enemy, and neutral forces are located. Combat identification is a subset of and complement to situational awareness. Each can enhance the effectiveness of the other, and both contribute to avoiding fratricide and improving combat effectiveness.

[6]The first two phases of the Army's BCI program were (1) quick fix and (2) quick-fix plus. The quick-fix phase included the development and production of various infrared identification systems. The quick-fix plus phase includes the development and production of positive navigation systems and the integration of global positioning systems to enhance situational awareness as well as further developments in thermal identification systems.

cooperative IFF Q&A system was selected for BCIS as the near-term technology.

The near-term cooperative IFF Q&A system is currently in engineering and manufacturing development (EMD). The Army is acquiring 45 EMD models and is planning to acquire another 115 in fiscal year 1996 to be demonstrated during the fiscal year 1997 digitized brigade experiment known as Task Force XXI. The Army currently estimates the cost of providing the near-term BCIS to 6,400 selected platforms of Force Package I[7] at between $250 million and $300 million. The ultimate cost of BCIS would be substantially higher if all Army divisions were to be equipped.

The Army is just beginning the mid- and long-term phases of its BCI efforts with the development of a COEA to identify affordable and promising alternatives. The objectives of the mid- and long-term phases are to integrate situational awareness and target identification and to have an automated correlation and display of situational awareness and target identification information. The mid- and long-term cooperative IFF Q&A system may be different than the near-term technology.

Navy's Efforts

As the lead for cooperative aircraft identification development, the Navy has been working on its Cooperative Aircraft Identification (CAI) effort to address deficiencies in the currently used aircraft identification system, Mark XII. The CAI effort is to provide a system to replace or upgrade the Mark XII system for use in air-to-air and ground-to-air identification. Navy officials have estimated that a Mark XII follow-on system could cost more than $3.5 billion.

In addition to providing reliable, secure identification of friends, any Mark XII follow-on system will have to ensure future civil aviation air traffic control compatibility. Mode S is a civil aviation air traffic control capability started by the United States and now planned for international use. Eurocontrol, the European aviation authority, has mandated Mode S usage by January 1, 1999. Mark XII transponders, however, do not currently incorporate Mode S. Without this capability, U.S. military aircraft may face delays in the use of civil airspace or may even be excluded from certain regions during peacetime.

[7]Force Package I contains 5-1/3 divisions. The Army currently has a total of 12 active divisions. There are an additional eight National Guard divisions. Current plans are for the Army to reduce to 10 active and 5 National Guard divisions by fiscal year 1999.

In June 1994, the Naval Research Laboratory completed and published a draft COEA for the CAI effort. That COEA was not approved because some Navy officials believe it did not consider subsequently proposed alternatives that should be considered. Additionally, the Navy provided only about half of the funding required for fiscal years 1996 and 1997 to accomplish a 1997 scheduled decision on whether to move the CAI effort forward to the next phase of the acquisition process—demonstration and validation.

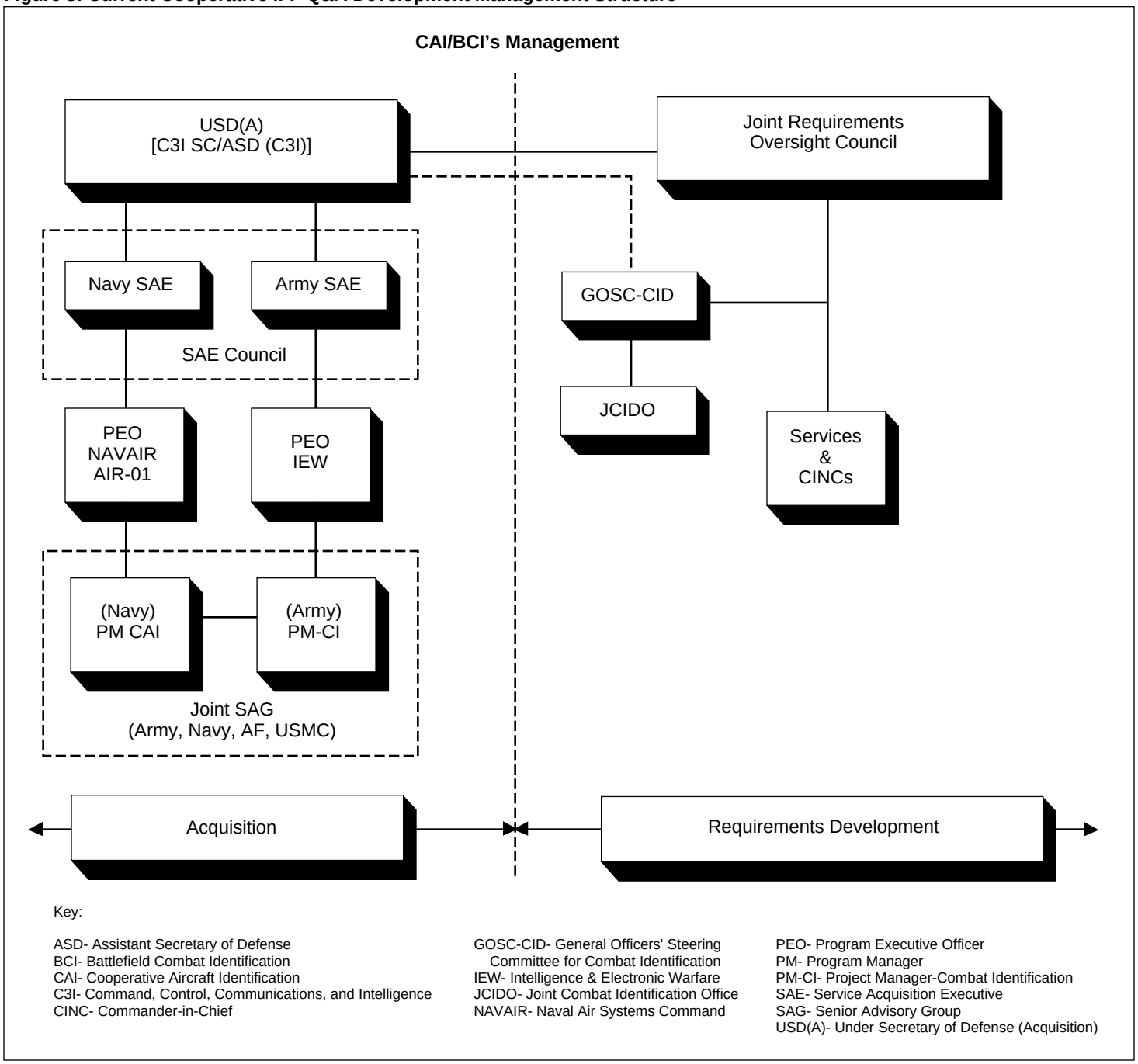
Cohesive Management Plan and Structure Needed

The services' current management plan and structure for cooperative IFF Q&A systems, which reflect the division of responsibility between the Army and the Navy, lack needed cohesiveness. While the Army and the Navy have worked to coordinate their efforts, the separation of responsibility between the two services may result in the selection of suboptimal solutions, unnecessary program delays, and the acquisition of systems that may not be interoperable across the services.

The services defined the management structure for their efforts to combat fratricide in a December 1992 memorandum of agreement on combat identification. In its capacity as lead for the services' cooperative IFF Q&A systems development, the Navy led the development of the management section of DOD's September 1993 Joint Master Plan for Cooperative Aircraft and Battlefield Combat Identification. The plan provides a management approach that is intended to coordinate cooperative identification requirements development and management mechanisms to ensure development, procurement, and integration of interoperable surface and air identification systems.

As shown in figure 3, the management structure identified in the plan uses the organizations defined in the services' memorandum of agreement on combat identification.

Figure 3: Current Cooperative IFF Q&A Development Management Structure



Source: DOD.

The principal coordinating bodies identified in the plan are the General Officers' Steering Committee for Combat Identification, the Joint Combat Identification Office, the Service Acquisition Executive Council, and the Senior Advisory Group. The General Officers' Steering Committee for Combat Identification provides senior level review and coordination of all Army, Navy, Air Force, and Marine Corps combat identification requirements, development and procurement efforts, product improvements, and related technologies. The Joint Combat Identification Office provides action officer level coordination and functions as the primary information center for all combat identification issues, programs, requirements, and technologies. The Senior Acquisition Executive Council was established to provide the highest level of service coordination, while the Senior Advisory Group is to provide program manager level coordination.

Suboptimal Solutions, Delays, and Interoperability Risked

The separation of responsibility for the development of cooperative IFF Q&A systems between the Army and the Navy is not conducive to looking for and finding common technological solutions. For example, a DOD official informed us that a North Atlantic Treaty Organization ally has demonstrated a laser interrogation and D-band[8] response system for ground-to-ground identification. Since the Mark XII system operates in the D-band,[9] the adoption of a D-band ground-to-ground system, if feasible, could be a cost-effective solution providing interoperability among the services. The Army, however, has not considered that D-band system or one like it for ground-to-ground identification.

Even absent the identification of a common technology, the current management plan and structure have allowed the services to pursue systems without fully considering how and if those systems can cost effectively be made interoperable. For example, the Navy's COEA could not fully consider the equipment that would be needed to unify the Army's mid- and long-term approach with the Navy's CAI system because that approach has not been defined. Since a Mark XII follow-on wave form has not been identified for CAI, the Army will have similar difficulties.

While the Army and the Navy have worked to coordinate their efforts, the current management structure and plan perpetuate the stovepipe development of cooperative IFF Q&A systems. In commenting on an earlier

[8]D-band comprises the radio frequency range of 1 to 2 gigahertz.

[9]Specifically, the Mark XII system queries at a frequency of 1.03 gigahertz and answers at a frequency of 1.09 gigahertz.

draft of the management plan, the Under Secretary of Defense for Acquisition stated ". . . I am concerned that the 'stovepipe' management scheme shown . . . will not enable possible equipment interoperability and commonality to be realized between aircraft and battlefield systems." A Navy official informed us that the plan's developers added the Senior Acquisition Executive Council and Joint Senior Advisory Group to the plan's organizational chart to address this criticism. However, these organizations were already defined in the draft plan because they were included in the services' memorandum of agreement on combat identification. Furthermore, the delays in developing a new air-to-air and ground-to-air cooperative IFF Q&A system combined with the recent Army start of its mid- and long-term efforts provide an opportunity to address the Under Secretary's concerns through joint management of the Army's and Navy's efforts.

The current management structure also risks unnecessary delays in the development and fielding of a set of systems planned to help prevent future fratricide by allowing the services to prioritize their efforts differently. For example, while DOD has made development of combat identification systems a high priority, the Navy, through its funding process, did not make CAI a high priority. Given the high priority DOD places on combat identification, the Office of the Assistant Secretary of Defense for Command, Control, Communications, and Intelligence (ASD/C3I) proposed an Office of the Secretary of Defense (OSD) funding line for the CAI effort to (1) pursue the planned course of development or (2) alternatively use an advanced concepts and technology demonstration (ACTD)[10] to accelerate it.

OSD decided not to proceed with the Program Objective Memorandum proposed strategy. Instead, OSD adopted the position that the existing Mark XII system satisfies the services' current air-to-air and ground-to-air cooperative IFF Q&A system requirements. Its current strategy is an evolutionary upgrade of Mark XII equipment to provide improved reliability and maintainability and greater upgradeability, while over the next couple of years defining, under a continued Navy-led effort, in coordination with our allies, what a Mark XII follow-on wave form might look like. The upgradeability of the new Mark XII system would allow for the addition of Mode S capability and implementation of the Mark XII

[10]In general, an ACTD is to demonstrate "novel" yet relatively mature technologies through the placement of prototype equipment with an active military unit(s) of one or more of the services. The prototypes are evaluated by the service(s) during operation level exercises. The ACTD evaluation is then to be used in deciding whether to procure the technology.

follow-on wave form, should the services later decide that the current wave form no longer satisfies their requirements.

If the Program Objective Memorandum proposal had been adopted, it would have alleviated any risk of delay in Mark XII efforts due to low prioritization. However, it would not have corrected the stovepipe nature of the management structure and plan.

Even given OSD funding of the Mark XII effort, the continued division of development under the current management plan and structure would allow the Army's and the Navy's efforts to continue unsynchronized. The Navy's initial time lead in development resulted in the Navy and Army programs being unsynchronized. The current delays in defining a Mark XII follow-on wave form, however, provides an opportunity for a jointly managed effort. The original Navy time lead is what led to (1) the Navy's uncertainty about likely mid- and long-term ground identification systems and (2) the Navy's inability to consider in its COEA the equipment necessary to obtain interoperability with those ground identification systems. Schedule changes in separate efforts could again result in difficulties obtaining full consideration of interoperability issues. Separate service efforts risk delays in the development and fielding of cooperative IFF Q&A systems due to time and resource expenditures to obtain "after-the-fact" interoperability, if required. Additionally, a dual management structure means dual funding of dual efforts when a single management structure and funding source could provide efficiencies resulting in not only monetary savings but also faster development and earlier fieldings.

Proposed Funding Action Is Step in Right Direction

The ASD/C3I proposal that an OSD program line be created and funded to ensure cooperative aircraft IFF continuity also provided for the demonstration and validation or an ACTD of an armor identification capability using the upgraded aircraft IFF signal format. The ASD/C3I proposal noted that a COEA on alternatives to the Mark XII system,

> ". . . has been completed, and alternatives for improving the system and applying it to armor identification were to be considered at a CAI Milestone I review originally planned for the fall of 1993. However, the Services do not place a high priority on upgrading the Mark XII or on defining and demonstrating an integrated aircraft/armor identification system, and they have yet to schedule the review."

We believe ASD/C3I's proposed action was a step in the right direction and that a single funding line for both the Navy's CAI effort and the Army's BCI

program would help ensure coordinated aircraft and ground cooperative IFF Q&A systems development. While ASD/C3I's proposed action would have alleviated some of the unnecessary risk currently associated with the services' management structure and plan, it would not have corrected the stovepipe nature of that structure and plan. We believe, therefore, that, in addition to having a single funding line, those efforts should be managed under a structure similar to that recommended by DOD's Acquisition Reform Process Action Team[11] in its recent report[12] on reengineering the acquisition process.

The Process Action Team recommended that a trial management structure be tested on selected programs for which either a joint requirement exists or there is a need for substantial integration among the components. Specifically, the team recommended that the Principal Deputy Under Secretary of Defense (Acquisition and Technology) be designated as a Joint Acquisition Executive and be delegated oversight, review, and budgeting/programming responsibility for those selected programs. The team noted that

"the creation of a Joint Acquisition Executive permits the DOD to directly address the long-standing problems encountered by joint programs. Issues of agreement on requirements, dictated marriages and shifting priorities are avoided by having the programs placed under a purple-suited decision maker who has fiscal resource management authority. No single Component will be able to optimize system performance at the expense of other users . . . ."

The team stated that the advantages of such a management structure included reduction of program redundancy, promotion of commonality across the services, and stabilization of funding by removing funds from the vagaries of each service's priorities. We believe that the adoption of the proposed management structure outlined by the team could help ensure the development of a cost-effective, integrated combat identification solution(s) while maintaining appropriate OSD oversight.

Joint COEA Needed

The Army's and the Navy's development of separate COEAs for their respective BCI and CAI efforts risks the selection and development of systems that may not represent the most cost and operationally effective solution(s). The division of responsibility for cooperative IFF Q&A systems

[11]The Secretary of Defense chartered this team to develop ". . . a comprehensive plan to reengineer the oversight review process for systems acquisition, in both the Components and OSD, to make it more effective and efficient, while maintaining an appropriate level of oversight."

[12]Reengineering the Acquisition Oversight and Review Process, Vol. 2, Implementation Plan, a report by the DOD Acquisition Reform Process Action Team, Dec. 9, 1994.

development between the Army and the Navy raises interoperability issues. Ground and air platforms that represent threats to each other and that are provided cooperative IFF Q&A systems based on different technologies will either have to field dual systems or systems that have been made interoperable or will remain at risk of fratricide from each other. COEAs that do not fully consider the desirability of interoperability, the way to obtain it, and its cost risk suboptimal solutions.

In providing guidance on COEAs, DOD Instruction 5000.2 notes that "individual systems generally cannot be evaluated in isolation." It goes on to state that ". . . the analysis must consider all relevant systems and the synergisms, such as interoperability, and potential difficulties they collectively represent on the battlefield." The development of separate COEAs for IFF Q&A systems has not allowed and may not allow proper consideration of the interoperability issue and thus risks the selection of a suboptimal solution(s). A DOD official expressed concern about this risk when commenting on the plan to perform separate COEAs for the BCI and CAI efforts during the first meeting of the Combat Identification COEA Oversight Group that OSD established to periodically review the two COEA efforts. Additionally, Naval Research Laboratory officials who conducted the CAI COEA stated that because the Army's selected near-term technology differed so dramatically from their expectations, the BCIS initially envisioned in their CAI COEA was made irrelevant by the Army selection. Without an approved Mark XII follow-on wave form identified, the Army will face the same difficulty addressing interoperability in its currently started BCI COEA effort. The performance of a joint COEA now, giving due consideration to the interoperability issue, will help assure the selection and development of the most cost and operationally effective solution(s).

The recent delays in the Navy's efforts combined with the Army's recent start of its mid- and long-term BCI COEA provide an opportunity to develop a joint COEA for combat identification. A DOD official stated that an agreement with the allies on a Mark XII follow-on wave form should be accomplished within 2 years. The current Army schedule calls for the mid- and long-term COEA to be completed in fiscal year 1997, which provides time for a joint COEA effort to consider the new wave form being discussed with U.S. allies, expand the Navy's COEA to consider subsequently proposed solutions, and merge the work with the Army's COEA efforts. A joint COEA would ensure that DOD and the services have a joint analysis that will help to select systems representing the most cost and operationally effective integrated solution.

Army Acquisition of Additional Systems Risks Wasting Millions of Dollars

The Army continues to invest in its near-term millimeter wave cooperative system when there is no discernible indication whether this system can or should be integrated into mid- and long-term solution(s). Without a completed COEA for BCI, there is no way to tell whether the near-term system should be or will be a part of the mid- and long-term solution(s). Furthermore, the Army may never choose to make large scale fieldings of the near-term system due to affordability.

In our prior report on combat identification, we noted that the Army planned to begin procuring the near-term millimeter wave cooperative identification system without an analysis of whether the near-term system could be integrated into the mid- and long-term solution(s). At that time, we recommended that the Army not begin procurement of the systems until it had determined whether the near-term systems could be integrated into the mid- and long-term solution(s). DOD agreed that the integration of the near-term BCIS into the long-term approach is an important consideration in deciding on the production of the near-term system. Nevertheless, the Army now plans to acquire more near-term systems than are necessary to reach a production decision without the analysis we suggested.

Our current evaluation showed that the Army plans to use $5 million in fiscal year 1995 funds and has requested about $18.4 million of fiscal year 1996 funds to acquire 115 additional near-term systems beyond the 45 in its current EMD contract. The Army intends to use these units, in combination with 25 refurbished EMD units, in the testing of the digitized battlefield concept. However, the Army did not develop a specific analysis to support the need to demonstrate 140 BCISs during the digitized brigade experiment. Rather, Army officials stated that the goal of the near-term BCIS demonstration was to sell individual soldiers on the system and provide higher level Army officials with an understanding of its operational effectiveness. They noted that the more soldiers supporting the acquisition of the system the better. This formed the basis for their "the more, the better" rationale. Given funding and time constraints, 115 systems are all "the more" that can be acquired. The Army has already awarded a contract option to obtain 45 of the additional 115 systems and expects to award a second option at a cost of about $15.2 million for the remaining systems in July 1995. When questioned about the impact of limiting the demonstration to 70 systems (i.e., those already on hand or on contract), Army program officials stated that they could accomplish their goals for the demonstration with 70 systems.

There are concerns within DOD and the Army over the affordability and cost-effectiveness of the near-term system, and it may never be fielded for these reasons. The selection of a cooperative technology to pursue in the mid- and long-term will be determined in part by the Army's mid- and long-term COEA, an effort that has just started. Until a mid- and long-term cooperative technology is selected, the continued acquisition of the near-term system risks wasting millions of dollars on a system that may not be able to be integrated into the mid- and long-term solution(s). Furthermore, acquiring more systems to demonstrate during the Task Force XXI exercise than is necessary to accomplish the goals of that demonstration also risks millions of dollars.

Recommendations

We recommend that the Secretary of Defense (1) create a single OSD funding line for the Army's BCI and Navy's CAI efforts, (2) direct the Secretaries of the Army and the Navy to develop and institute a cohesive management structure and plan in line with the Process Action Team's recommendation, and (3) direct the Secretaries of the Army and the Navy to develop a joint COEA for their BCI and CAI efforts giving due consideration to the problem and costs of obtaining systems' interoperability.

We also recommend that the Secretary of Defense direct the Secretary of the Army to (1) use the 70 near-term systems on hand or currently under contract for the Task Force XXI digitized brigade experiment and (2) not acquire more near-term systems than necessary until the Army determines the near-term technology is affordable and will be fielded and whether, if determined desirable, it can be integrated into the mid- and long-term combat identification and aircraft solution(s).

Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD agreed that the requirements for aircraft and battlefield identification should not be addressed in isolation. It stated that this was one of the reasons they formed a Combat Identification Task Force in October 1994. DOD stated that the task force was created to consider the overall architectural framework for combat identification and within that architecture, the techniques and programmatic plans for battlefield identification and for the Mark XII identification system. DOD also stated that management actions are being taken that reflect the results of the task force, and that address the concerns described in our report. Specifically, DOD stated that a joint COEA on battlefield identification is being organized, and technology

demonstrations that will be an important element of the evaluation will be guided and partially funded by OSD.

DOD did not agree that Army's plan to acquire 140 near-term systems for the Task Force XXI digitized brigade experiment risked wasting millions of dollars. In discussing Army officials' comments made to us that they could accomplish their goals for the experiment with 70 near-term systems, DOD stated that the adequacy of 70 systems was judged in the context of a contingency plan, should 140 systems not be available. It also stated that the acquisition of more units would result not only in more operational experience and more data but also in a greater capability left with the forces. DOD partially agreed with our recommendation that the Army be directed to not acquire more near-term systems prior to a determination that the near-term system is affordable and will be fielded and whether it can be integrated into the mid- and long-term solution(s). DOD noted that although the integration of the near-term system into the long-term solution is an important consideration, it may be prudent to produce the near-term system even if it is not part of the long-term architecture and noted that it was concerned that, without a near-term system, U.S. forces may face a period of 10 years or more with no substantial improvement in their ability to identify combat vehicles.

While DOD, in forming its Combat Identification Task Force, may have been motivated by many of the same concerns expressed in our report, it does not appear that the task force's final product will address the issues identified in our report. Specifically, based on briefings we have received on the task force's efforts, the task force's final product will not (1) address needed management changes to provide cohesiveness in the services' cooperative identification development efforts; (2) dictate a joint, single COEA for those efforts; and (3) address the Army's plan to acquire more near-term systems than are required for the Army to reach a production decision. Furthermore, while the task force has developed an overall architectural framework for combat identification, it does not appear to provide the management structure and plans needed to assure a cohesive effort to obtain the goals of that architecture. The architecture provides direction to the services. However, in the past, DOD has provided direction to the services that was subsequently ignored. For example, as we noted earlier, while DOD has placed a high priority on combat identification efforts, the Navy did not place a high priority on its CAI effort and underfunded it.

Regarding the Army's plan to acquire more near-term systems than are necessary to accomplish the Army's goals for the Task Force XXI experiment, the DOD's comment indicates that 70 systems are adequate for conducting the experiment if 140 systems are not available. Since the Army has not yet made a procurement decision for the near-term BCIS, the expenditure of $15.2 million to acquire 70 systems beyond the 70 necessary to accomplish the goals for the demonstration risks millions of dollars on a system that may never be fielded. If the Army can accomplish its goals for the demonstration with 70 systems, as Army officials have repeatedly informed us, then only 70 systems are needed. Furthermore, the Army did not produce and does not have an analysis to support a requirement to demonstrate 140 BCIS units. There is no debating that more units will provide more operational experience and data. This, however, should not be the basis for acquiring more systems than are needed to accomplish the goals of the demonstration. DOD's comment stating that it might be prudent to produce the near-term system even if it is not a part of the long-term architecture is not debated, and our recommendation would not prevent the Army from fielding any system for 10 years. We simply believe it would be prudent for the Army to make its production decision for the near-term system taking into consideration its decision for its mid- and long-term solution(s). Such a determination should be possible once the BCI COEA is completed. Since that COEA is currently scheduled to be completed in fiscal year 1997 and the BCIS production decision is currently scheduled to occur in late fiscal year 1997 or early fiscal year 1998, our recommendation would not delay the fielding of the near-term system. DOD's comments are reprinted in their entirety in appendix I, along with our evaluation.

Scope and Methodology

During this review, we interviewed officials and reviewed documents in Washington, D.C., at the offices of the ASD/C3I; the DOD Joint Combat Identification Office; the Assistant Secretary of the Navy for Research, Development, and Acquisition; the U.S. Navy, Air Traffic Control and Landing Systems Office; the U.S. Navy, Office of the Director of Navy Space Systems Division; the Naval Research Laboratory; and the Defense Intelligence Agency. We also reviewed documentation issued from the offices of the Under Secretary of Defense for Acquisition and Technology, the Joint Requirements Oversight Council, the Congressional Research Service, and the Office of Technology Assessment. We visited, received, and analyzed information from the U.S. Army Communications and Electronics Command, Fort Monmouth, New Jersey; the U.S. Army Training and Doctrine Command, Fort Monroe, Virginia; the U.S. Army

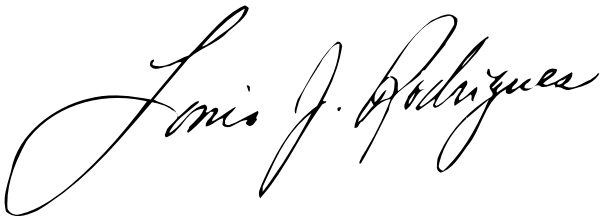
Armor Center and School, Fort Knox, Kentucky; the U.S. Army Aviation Center, Fort Rucker, Alabama; and the Headquarters of the U.S. Marines Corps' Combat Development Command, Quantico, Virginia.

In addition, we visited and received briefings on the Air Force's Combat Identification Integration Management Team from Air Force personnel at the Directorate of Special Projects, Electronic Systems Center, Hanscom Air Force Base, Massachusetts. We also visited and received briefings on the OSD sponsored Joint Air Defense Operation/Joint Engagement Zone exercises from service personnel at Eglin Air Force Base, Florida.

We conducted this review from August 1994 to July 1995 in accordance with generally accepted government auditing standards.

We are sending copies of this report to other appropriate congressional committees; the Director, Office of Management and Budget; and the Secretaries of Defense, the Army, and the Navy. We will also make copies available to other interested parties upon request.

Please contact me at (202) 512-4841 if you or your staff have any questions concerning this report. Major contributors to this report were William L. Wright, Bruce H. Thomas, and Peris Cassorla.



Louis J. Rodrigues
Director, Systems Development
and Production Issues

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The Honorable Sam Nunn, Ranking Minority Member
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United States Senate

The Honorable Ted Stevens, Chairman
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Comments From the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

ASSISTANT SECRETARY OF DEFENSE

6000 DEFENSE PENTAGON
WASHINGTON, DC 20301-6000

COMMAND, CONTROL COMMUNICATIONS AND INTELLIGENCE

July 6, 1995

Mr. Henry L. Hinton, Jr.
Assistant Comptroller General
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Hinton:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "Minimizing Friendly Fire: Changes Needed in Management Plans and Structure," dated May 22, 1995 (GAO Code 707055/ OSD Case 9936). The Department partially concurs with the report.

See comment 1.

The Department agrees that the requirements for aircraft and battlefield identification systems should not be addressed in isolation. This was one of the reasons for forming the Combat Identification Task Force (CITF) in October 1994. This high-level group, chaired by my Principal Deputy, was created to consider the overall architectural framework for combat identification and, within that architecture, the techniques and programmatic plans for battlefield identification and for the Mark XII identification system. The CITF completed the bulk of its work last May.

See comment 2.

Management actions are being taken that reflect the results of the CITF, and that address the concerns described in your draft report. A joint Cost and Operational Effectiveness Analysis on battlefield identification is being organized, and the technology demonstrations that are an important element of the evaluation will be guided and partially funded by the Office of the Secretary of Defense. We continue to maintain close oversight of the Army's near-term battlefield identification effort, to ensure that the

See comment 3.

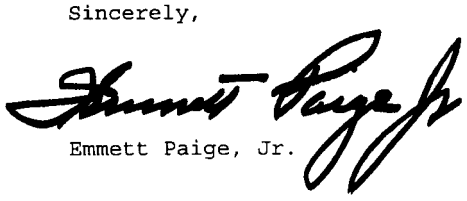
See comments 1 and 4.

overall methodology for the near-term and long-term solutions is cost-effective. The DoD believes that, while the draft GAO report addresses important issues, it has two significant shortcomings. The first is its relatively narrow focus on one particular technology - Question and Answer systems. Such systems are expected to be an important part of our combat identification architecture. The level of investment in this technology, however, must be considered in the context of its operational value in comparison to other, competing techniques. This broader perspective regarding overall combat identification requirements and architecture does not appear in the draft report.

The second shortcoming, partly due to timing, is the lack of information reflecting the activities and outputs of the CITF. Since the motivation for initiating the CITF was similar to some of the GAO concerns, and since some of the results directly address issues described by the GAO, a much more extensive description of the CITF and its products is warranted.

Our detailed comments on the report findings and recommendations are provided in the enclosure. Technical corrections to the report were previously provided to your staff. We would be pleased to provide more information on overall combat identification requirements and on the Combat Identification Task Force, as outlined above. The DoD appreciates the opportunity to comment on the draft report.

Sincerely,



Emmett Paige, Jr.

Enclosure

GAO DRAFT REPORT
(GAO CODE 707055) OSD CASE 9936

"MINIMIZING FRIENDLY FIRE: CHANGES NEEDED IN MANAGEMENT PLANS AND STRUCTURE," DATED MAY 22, 1995

FINDINGS AND RECOMMENDATIONS TO BE ADDRESSED IN THE DOD RESPONSE TO THE GAO DRAFT REPORT

FINDINGS

FINDING A: Cohesive management Plan and Structure and Single OSD Funding Line Needed. The GAO reports that the Service's current management plan and structure for cooperative identification of friend or foe (IFF) question and answer (Q&A) systems, which reflect the division of responsibility between the Army and the Navy lack needed cohesiveness. While the Army and Navy have worked to coordinate their efforts, the separation of responsibility between the two Services may result in the selection of suboptimal solutions, unnecessary program delays, and the acquisition of systems that may not be interoperable across the Services.

The GAO also reports that given the high priority the DoD places on combat identification, the Office of the ASD(C3I) proposed an OSD funding line for the Navy's Cooperative Aircraft Identification (CAI) effort. The GAO states that it believes that the ASD(C3I) proposed action was a step in the right direction and that a single funding line for both the Navy's CAI and the Army's battlefield combat identification system (BCIS) would help ensure coordinated aircraft and ground cooperative IFF Q&A systems development.

The GAO further states that in addition to a single funding line for the Army and Navy combat identification efforts, the Services' combat identification development efforts should be managed under a structure similar to that recommended by the DoD Acquisition Reform Process Action Team in its December 9, 1994, report on reengineering the acquisition process. The Process Action Team recommended that a trial management structure be tested on selected programs for which either a joint requirement exists or there is a need for substantial integration among the components. (pp. 9-10, p. 14, pp 16-17/GAO Draft Report)

Now on p. 7, p. 10, and pp. 11-12.

See comments 1 and 5.

DOD RESPONSE: Partially concur. The Department shares the concerns of the GAO, but the GAO findings do not incorporate the recent results of the Combat Identification Task Force (CITF). This is a high-level group that was formed in October 1994 to determine the overall architectural framework for combat identification, to avoid suboptimal solutions for armor and aircraft applications. The CITF included all DoD organizations with significant interest in this area, and the bulk of the group's activities were completed in May of this year. The more promising alternatives for ground vehicle identification have been identified and an approach for upgrading the Mark XII aircraft identification system has been adopted.

See comment 6.

See comment 7.

See comment 8.

Management and funding arrangements are being established that reflect the results of the CITF, and that address the concerns of the GAO regarding cooperative identification developments. A joint Advanced Concepts Technology Demonstration (ACTD) and a number of Advanced Technology Demonstrations (ATDs) are being planned for the candidate battlefield identification techniques. The OSD will be the top-level manager of the ACTD/ATDs, and a significant portion of the funding will be provided from an OSD line. Additionally, we will shortly ask the Services to prepare a coordinated plan describing the strategy and organization for upgrading the Mark XII. Because of the evolutionary nature of the upgrade process and the reliance on commercial technology, this effort will not be a major program with centralized funding. We will strive, however, to introduce modernized Mark XII equipment in an efficient manner that realizes potential economies of scale.

See comment 9.

See comment 10.

The Department has also significantly strengthened Service coordination in the overall management of combat identification. Following the approval of the Mission Need Statement, the Joint Combat Identification Office (JCIDO) was formed in January 1993 under the General Officers Steering Committee on Combat Identification (GOSC-CI). The GOSC-CI, in turn, receives guidance from the Joint Requirements Oversight Council, which has been very active since Operation Desert Storm in addressing identification issues. These organizations coordinate Service requirements and program priorities for all identification applications and technologies, including cooperative and noncooperative sensors and related data-links. A key product of this process has been a joint, prioritized list of identification initiatives, with Service funding commitments. This coordination has also resulted in the elimination of duplication on several classified identification techniques, and in the continuation of joint testing of identification

See comment 11.

capabilities by means of the All Service Combat Identification Evaluation Team.

FINDING B: Joint Cost and Operational Effectiveness Analysis Needed. The GAO reports that the Army and Navy development of separate Cost and Operational Effectiveness Analyses (COEAs) for their respective BCIS and CAI efforts risk the selection and development of systems that may not represent the most cost and operationally effective solution(s). The division of responsibility for cooperative IFF Q&A systems development between the Army and the Navy raises interoperability issues. The GAO concludes that ground and air platforms that represent threats to each other and that are provided cooperative IFF Q&A systems based on different technologies, will either have to field dual systems or systems that have been made interoperable, or will remain at risk of fratricide from each other. The GAO adds that COEAs that do not fully consider how to obtain interoperability, or its cost, risk suboptimal solutions.

The GAO does state, however, that the performance of a joint COEA now, giving due consideration to the interoperability issue, will help assure the selection and development of the most cost and operationally effective solution. Furthermore, the GAO reports that the recent delays in the Navy's efforts, combined with the Army's recent start of its mid-/far-term BCIS COEA, provides an opportunity to develop a joint COEA for combat identification. (pp. 18-19/GAO Draft Report)

Now on pp. 12-13.

DOD RESPONSE: Partially concur. The Navy-led joint Cost and Operational Effectiveness Analysis (COEA) for the Mark XII has been superseded by the Mark XII upgrade strategy adopted by the Department. A joint COEA, led by the Army, is being organized to evaluate the more promising techniques for the far-term battlefield identification solution. A wide range of candidates will be considered for the cooperative element, including stand-alone systems and systems that are partially integrated with existing or planned capabilities (e.g., SINCGARS, Mark XII, Digitized Battlefield). Service interoperability will be essential for the solution, in addition to operational effectiveness and affordability. Performance and cost considerations may result in the use of different technologies for the cooperative aircraft and battlefield identification systems, or in some level of commonality between the two (e.g., crypto, message formats, modulation, frequencies).

See comment 12.

FINDING C: Army Acquisition of Additional Systems Risks Wasting Millions of Dollars. The Army continues to invest in its near-term millimeter wave cooperative system when there is no discernible indication that this system can or should be integrated into mid and long-term solutions. Without a completed COEA for battlefield combat identification, there is no way to tell whether the near-term system should be, or will be, part of the mid and far-term solution. Further, the GAO reports, the Army may never choose to make large scale fielding of the near-term system due to affordability.

The GAO found that the Army plans to acquire 115 additional near-term systems beyond the 45 in its current engineering and manufacturing development (EMD) contract. The GAO reports that the Army intends to use these units, in combination with 25 refurbished EMD units, in the testing of the digitized battlefield concept. The Army, the GAO reports, did not develop a specific analysis to support the need to demonstrate 140 BCIS systems during the digitized brigade experimant. When questioned about the impact of limiting the demonstration to 70 systems (i.e., those already on hand or on contract) the GAO reports that Army program officials stated they could accomplish their goals for the demonstration with 70 systems.

The GAO writes that there are concerns within DoD and the Army concerning the affordability and cost effectiveness of the near-term system, and it may never be fielded for these reasons. The GAO concludes that until a mid-/far-term cooperative technology is selected, the continued acquisition of the near-term system risks wasting millions of dollars on a system that may not be able to be integrated into the mid and far-term solutions. Furthermore, acquiring more systems than is necessary to demonstrate during the Task Force XXI exercise also risks millions of dollars. (pp. 20-22/GAO Draft Report)

Now on pp. 14-15.

DOD RESPONSE: Non-concur. The Department does not believe that acquiring 140 systems for the demonstration would be wasteful. The adequacy of 70 systems was judged in the context of a contingency plan, should 140 systems not be available.

See comment 13.

The primary purpose of the Advanced Concepts Technology Demonstration is to determine the operational utility of particular identification capabilities, and to provide "leave-behind" equipment for continued operator evaluation. The Battlefield Combat Identification System (BCIS) is the most mature technique for demonstrating direct identifica-

tion of ground vehicles, with excellent performance in the tests that have been accomplished to date.

It is desirable to equip the entire Force XXI Brigade with BCIS so the whole fighting unit can evaluate the capability for the maximum number of applications and situations, including scenarios wherein battalions approach a common boundary. To fully equip the Brigade would require 372 BCIS units. An additional 15 are needed for Marine Corps participation, and another 15 are required for a planned international demonstration with the NATO Allies.

The Department's purchase will be considerably less than the 402 systems that could be profitably utilized. There is some judgment involved in determining how many units are adequate for the demonstration, but every additional system up to 402 will have value. More units will result not only in more operational experience and more data, but in a greater capability left with the forces

See comment 14.

RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense create a single funding line for the Services' combat identification efforts. (p. 22/GAO Draft Report)

Now on p. 15.

DOD RESPONSE: Partially concur. The funding for one of the Department's highest-priority combat identification efforts, the Advanced Concepts Technology Demonstration (ACTD) of candidate techniques for battlefield identification, will be provided in part from an OSD funding line. The DoD believes, however, that establishing a single funding line for executing the Department's numerous combat identification projects would be impractical. These initiatives encompass a wide range of technologies and applications, at different stages of development and levels of effort.

See comment 15.

See comment 7.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense direct the Secretaries of the Army and the Navy to develop and institute a cohesive management structure and plan in line with the DoD Acquisition Reform Process Action Team's recommendation. (p. 22/GAO Draft Report)

Now on p. 15.

DOD RESPONSE: Partially concur. The Department believes that a coherent management structure is required for joint combat identification efforts. The recommendations of the DoD Acquisition Reform Process Action Team, however, were

amended by the Under Secretary of Defense for Acquisition and Technology in his memorandum of April 28, 1995, which stated

See comment 16.

> "The management and oversight of joint programs shall remain as practiced today. However, the Director, Acquisition Program Integration shall establish a team to consider the problems of joint program management and develop solutions."

See comment 9.

The Department is taking steps to provide more integrated management of combat identification activities. A joint Memorandum of Agreement was signed by the Services in January 1993 to create the Joint Combat Identification Office (JCIDO). The JCIDO coordinates identification requirements and programs amongst the Services under the oversight of the General Officer's Steering Committee on Combat Identification. Furthermore, a single OSD funding line has been established for a joint Advanced Concepts Technology Demonstration, which will be guided by OSD to ensure that a joint perspective is maintained. Additionally, before the end of FY 1995, we intend to ask the Services to provide a plan, including the organization, for the coordinated upgrade of the Mark XII system, so that it will be accomplished as efficiently as possible.

See comment 7.

See comment 17.

RECOMMENDATION 3: The GAO recommended that the Secretary of Defense direct the Secretaries of the Army and Navy to develop a joint COEA for their combat identification efforts giving due consideration to the problem and costs of obtaining systems interoperability. (p. 22/GAO Draft Report)

Now on p. 15.

DOD RESPONSE: Partially concur. The Department is organizing a joint Cost and Operational Effectiveness Analysis (COEA) for Battlefield Combat Identification (BCI) which is planned for completion in fiscal year 1997, but the COEA for the Mark XII aircraft identification system has been overtaken by the results of the Combat Identification Task Force. The BCI COEA will consider numerous alternatives that appear to have some potential for providing the needed performance and interoperability at an affordable cost.

See comment 12.

RECOMMENDATION 4: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to use the 70 systems on hand or currently under contract for the Task Force XXI digitized brigade experiment. (p. 22/GAO Draft Report)

Now on p. 15.

See comments 13, 14, and 18.

DOD RESPONSE: Nonconcur. As previously discussed in our response to Finding C, seventy systems are inadequate to meet the equipment needs for the planned demonstrations, namely, the Advanced Concepts Technology Demonstration in connection with the Task Force XXI exercise, and the international demonstration of battlefield identification technologies.

Now on p. 15.

RECOMMENDATION 5: The GAO recommended that the Secretary of Defense direct the Secretary of the Army to not acquire any more near-term systems until the Army determines the near-term technology is affordable and will be fielded, and that it can be integrated into the mid-term and long-term combat identification and aircraft solution(s).

See comments 13, 14, and 18.

DOD RESPONSE: Partially concur. As stated above, the Department believes that additional systems must be acquired to meet equipment needs for the planned demonstrations. Regarding acquisition for operational application, the Department's actions accord with the GAO concerns. The Deputy Assistant Secretary of Defense for Command, Control, Communications and Intelligence Acquisition, in memorandum dated July 30, 1993, limited the effort on the near-term system to development and testing until there is a better understanding of the costs and the long-term alternatives.

See comment 19.

Dictating integration of the battlefield and aircraft solutions, as the GAO recommends, would prejudge the outcome of the Cost and Operational Effectiveness Analysis that will be performed. The most cost-effective long-term solution may or may not have commonality with the aircraft solution.

See comment 20.

Performance requirements for aircraft and armor identification differ markedly in some areas (e.g., range and resolution), and it is not clear that a common system can provide the needed performance. Additionally, integration with other existing or planned systems (e.g., SINCGARS) may prove to be the optimal solution.

See comment 21.

Additionally, although integration of the near-term system into the long-term solution is an important consideration, it should not be overriding. The Assistant Secretary of Defense for Command, Control, Communications and Intelligence wrote on August 30, 1993, in response to GAO report NSIAD-94-19 on combat identification ("MINIMIZING FRIENDLY FIRE: The Army Should Consider Long-Term Solution In Its Procurement Decision On Near-Term Needs," OSD Case 9480), "it may be prudent...to produce the near-term system even if it is not part of the long-term architecture. The

Department is concerned that, without a near-term system, U.S. forces may face a period of 10 years or more with no substantial improvement in their capability to identify combat vehicles." The DoD view on this issue is unchanged.

The following are GAO's comments on the Department of Defense's (DOD) letter dated July 6, 1995.

GAO Comments

1. We appreciate that DOD shares our concern that the requirements for aircraft and battlefield identification should not be addressed in isolation. While this was one of the reasons the Combat Identification Task Force was formed, and we believe the task force's efforts were a step in the right direction, we do not believe the task force adequately addressed our concerns regarding the cohesiveness of the structures and plans created to manage the services' aircraft and battlefield cooperative identification efforts.

2. The management actions discussed represent a continuation of the stovepipe management of the ground and air identification efforts discussed in our report. The Army-led development of a cost and operational effectiveness analysis (COEA) for battlefield identification separate from the Navy-led similar analyses planned to help define what a new air identification wave form might look like perpetuates the stovepipe development scheme identified in our report.

3. As explained in our report, we focussed our evaluation on the services' cooperative identification of friend or foe (IFF) question and answer (Q&A) system efforts because the services are approaching major decision points in the acquisition process for those systems. To address DOD's concern, we have added information to the body of our report indicating that the services' cooperative IFF Q&A system development efforts are a part of a much broader array of efforts that should help minimize friendly fire incidents.

4. At the time our draft report was written, we were aware of the task force's efforts. We determined that while those efforts may have been motivated by many of the same concerns expressed in our report, it did not appear that the task force was going to address the issues related to our findings. Based on more recent briefings on the task force's outcome, it still does not appear that those issues were addressed. Specifically, based on the information we have received in briefings on the task force's efforts, the task force's final product will not (1) address needed management changes to provide needed cohesiveness in the services' cooperative identification development efforts; (2) dictate a joint, single COEA for those efforts; and (3) address the Army's plan to acquire more near-term systems than are needed to reach a production decision.

5. While the task force has developed an overall architectural framework for combat identification, it does not appear to provide the management structure needed to assure a cohesive effort to attain the architecture's goals. The architecture provides direction to the services. However, in the past, DOD has provided direction that was subsequently ignored. For example, as noted in our report, while DOD has placed a high priority on combat identification efforts, the Navy did not place a high priority on the Cooperative Aircraft Identification (CAI) effort and underfunded it.

6. The management and funding arrangements being established do not adequately address our concerns. The joint advanced concepts technology demonstration and advanced technology demonstrations planned are to demonstrate candidate battlefield identification systems, that is, ground-to-ground and air-to-ground solutions. The planned demonstrations are to focus on battlefield identification solutions, not on battlefield and aircraft identification solutions and their interoperability. Furthermore, the planned demonstrations will not address the underlying management structure's division of responsibility between the Navy and the Army and the risks that are associated with that division. The continued use of the current management plan and structure with its division of responsibility between the Army and the Navy still risks the selection of suboptimal solutions, unnecessary program delays, and the acquisition of systems that may not be interoperable across the services.

7. The Office of the Secretary of Defense's (OSD) role as the top level manager of these demonstrations and the funding of these demonstrations under an OSD line do not adequately address our concerns regarding the cohesiveness of the Army's and the Navy's efforts and the need for truly joint management. Under the current DOD plan, that is, the joint demonstrations, the Army and the Navy will continue to manage and fund separate developmental efforts for their respective areas of responsibility. Continued use of separate funding lines for those efforts will continue to pose interoperability risks and risks to the timely accomplishment of the most cost and operationally effective solutions.

8. While the evolutionary nature of the upgrade process and the reliance on commercial technology may or may not make centralized funding desirable, the DOD's adopted strategy includes working with U.S. allies to define what a new wave form might look like. The services' new wave form definition efforts will be a joint effort under a Navy lead, just as the Navy's original CAI effort was. We maintain our position that funding the services' new aircraft wave form definition and ground identification

efforts under a single funding line would help ensure coordinated aircraft and ground cooperative IFF Q&A systems' development.

9. As we indicated in our report, while the Army and the Navy have worked to coordinate their efforts, the current management structure and plan perpetuate the stovepipe development of cooperative IFF Q&A systems. As noted in our report, in commenting on an earlier draft of the management plan for the cooperative IFF Q&A development efforts, the Under Secretary of Defense for Acquisition stated ". . . I am concerned that the 'stovepipe' management scheme shown . . . will not enable possible equipment interoperability and commonality to be realized between aircraft and battlefield systems." The General Officers' Steering Committee on Combat Identification, the Joint Requirements Oversight Council, and the Joint Combat Identification Office were all defined in the draft and final management plans. Despite these coordinating bodies, we agree with the Under Secretary's assessment and believe the current management structure continues to perpetuate that stovepipe management scheme.

10. We have added information on the role of the General Officers' Steering Committee on Combat Identification to our report.

11. A prioritized list of identification initiatives with service funding commitments did not prevent the Navy from placing a lower priority on its CAI effort than DOD placed. As we note in our report, while DOD has made development of combat identification systems a high priority, the Navy, through its funding process did not make the CAI effort a high priority. Again, a single OSD funding line for both the Navy's new wave form and the Army's battlefield combat identification system (BCIS) efforts would help ensure coordinated aircraft and ground cooperative IFF Q&A systems development efforts and appropriate funding given DOD's prioritization of those efforts.

12. While DOD's adopted Mark XII upgrade strategy has superseded the Navy-led COEA, the continued research and development of air and ground systems without performing a joint COEA still risks the selection and development of systems that may not represent the most cost and operationally effective solutions. DOD's adopted strategy for upgrading the Mark XII includes working with U.S. allies to define what a follow-on Mark XII wave form might look like. In providing oral comments on a draft of this report, agency officials indicated that the new wave form air identification effort would include cost and operational effectiveness type analyses. Those analyses should be done as a part of a joint aircraft and

ground identification COEA to ensure that the most cost and operationally effective ground and air solutions are selected giving due consideration to the interoperability issue.

We recognize that commonality between air and ground identification systems may or may not be attainable or desirable from a cost and operational effectiveness standpoint. In fact, a joint COEA may support the use of different technologies for air and ground systems. The performance of a joint COEA, however, will not only help ensure the consideration of technological commonality between air and ground solutions but also the cost and operational effectiveness of solutions to provide interoperability between differing air and ground solutions. Because the Navy-led joint service new wave form air identification effort is to develop cost and operational effectiveness type analyses and the Army-led joint service ground identification effort is developing a formal COEA, it appears that minimal adjustment would be required to combine the two efforts to obtain a joint COEA ensuring due consideration of the interoperability issue. In addition, the final product of a joint COEA would present a service-wide, unified vision of the air and ground solution(s) to be pursued and the means, if determined attainable and desirable, by which air and ground interoperability will be obtained.

13. DOD's comment indicates that 70 systems are adequate for conducting the demonstration if 140 systems are not available. Since the Army has yet to determine whether it will procure the near-term BCIS, the expenditure of $15.2 million to acquire 70 systems beyond the 70 systems necessary to accomplish the goals for the demonstration risks millions of dollars on a system that may never be fielded.

14. At issue here is not whether the demonstration of more systems will have value, but rather the value of what is gained against the cost and the risk that the Army may never procure and field the BCIS. The Army did not produce and does not have an analysis to support a requirement to demonstrate 140 BCIS units. If the Army can accomplish its goals for the demonstration with 70 systems, as Army officials have repeatedly informed us, then only 70 systems are needed. There is no debating that more units will provide more operational experience and data. This, however, should not be the basis for acquiring more systems than are needed to accomplish the goals of the demonstration.

Army correspondence obtained during our evaluation states that this demonstration ". . . is going to be the decision making exercise to decide

whether to purchase . . . .” Clearly, a procurement decision is yet to be made. If the Army subsequently decides against procuring the BCIS, what value do the additional 70 systems then have and what is the value of the greater capability left with the forces. As we noted in our prior report on the Army’s combat identification efforts, vehicle deployments in Operation Desert Storm included 2,300 M1A1 Abrams tanks, 2,200 Bradley Fighting Vehicles, 20,000 High Mobility Multipurpose Wheeled Vehicles, over 4,400 Heavy Expanded Mobility Tactical Trucks, over 29,000 Tactical Wheeled Vehicles, and several thousand other wheeled vehicles. We do not believe, in view of the number of vehicles fielded, that the additional capability that would be left with the forces by the acquisition of 140 systems versus 70 systems is great enough to warrant the expenditure of an additional $15.2 million before a production decision is made.

15. DOD misinterpreted our recommendation. In line with Finding A, as reported by DOD, we believe the Army battlefield combat identification (BCI) and the Navy new wave form efforts should be managed under a single OSD funding line. We have rephrased our recommendation to clarify its scope.

16. We believe that it would be more accurate to state that the Under Secretary’s memorandum overruled the Process Action Team’s recommendation. Regardless, the Under Secretary’s memorandum still allows for joint program management and oversight. DOD’s response to the team’s recommendation recognizes that the current joint program management structure has problems but fails to offer solutions and merely creates another panel to consider the issue. We believe that the team’s recommendation should be tested, as it recommended. We believe a joint Army combat identification and a Navy new wave form aircraft identification effort would be an excellent candidate for testing the team’s recommendation.

17. The coordination among the services of the DOD’s adopted Mark XII strategy does not alleviate the stovepipe nature of the management structure represented in the continued division of the air and ground cooperative IFF Q&A systems development efforts between the Army and the Navy.

18. DOD’s response to our recommendation is at odds with its response to Finding C and to comments made by Army officials. In response to our recommendation, DOD states that 70 systems are inadequate to meet the equipment needs of the planned demonstrations. In response to Finding C,

DOD states that 70 systems were adequate if 140 systems were not available. Furthermore, Army program officials stated that they could accomplish their goals for the Task Force XXI demonstration with 70 systems. It is further evident from Army correspondence obtained during our evaluation that the Army's goals for the demonstration can be accomplished with fewer than 140 systems. In that correspondence, an Army official states

"Believe it is imperative that during Force XXI we not only evaluate how well BCIS works but the total impact BCIS has on the way we operate. Platforms are currently prioritized to give us the ability to look at this total impact even if we don't get the entire 140 systems we are currently planning for."

19. We have clarified our recommendation in view of DOD's comments. We believe that the acquisition of near-term systems should be limited to the minimum quantity required to complete any testing needed to make a production decision. Furthermore, the Army should not be allowed to acquire more near-term systems than that limit until a COEA based determination has been made that the near-term system, if deemed desirable, can be integrated, that is, made interoperable, with the mid- and long-term combat identification and aircraft solutions.

20. We recognize that commonality between air and ground identification systems may or may not be attainable or desirable from a cost and operational effectiveness standpoint, just as interoperability of differing air and ground systems may not be determined attainable or desirable. Nothing in our report dictates commonality. It does, however, argue that a joint COEA should be completed to assess this issue before moving forward.

21. As we pointed out in our response to DOD in our prior report, our recommendation will not prevent the Army's acquisition of the near-term system and will not require the Army to wait until long-term systems are fielded. As stated in our prior report, we believe it would be prudent for the Army to make its production decision for the near-term system taking into consideration its decision for its mid- and long-term solution(s). Such a determination should be possible once the BCI COEA is completed. Since that COEA is currently scheduled to be completed in fiscal year 1997 and the BCIS production decision is not scheduled to occur until late fiscal year 1997 or early fiscal year 1998, our recommendation would not delay the fielding of the near-term system. Our current recommendation extends the recommendation in our prior report to include a determination on interoperability with the new air identification wave form being defined.

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