

**GAO**

Report to the Secretary of Defense

February 1987

# RADIO FREQUENCIES

## Earlier Coordination Could Improve System Use and Save Costs



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**National Security and  
International Affairs Division****B-224129**

February 9, 1987

The Honorable Caspar W. Weinberger  
The Secretary of Defense

Dear Mr. Secretary:

We recently reviewed the Department of Defense's (DOD's) efforts to coordinate the use of radio frequencies with European nations for command, control, and communication systems. We found that delays and unnecessary costs resulted when DOD did not coordinate with host nations early in the development of communication systems to ensure that the frequencies selected would be approved. (See app. I.) In a separate and broader review of communications in the Pacific theater, we found a similar situation. (See app. II.)

**Early Coordination  
With Host Nations  
Necessary**

Because of late coordination with host nations, DOD has had to modify some command, control, and communication systems to meet frequency requirements overseas, which has resulted in costly delays.

Although DOD's acquisition and frequency management guidance is not specific as to when host nation coordination should take place, it does state that applications should be coordinated as early as possible in a system's acquisition (which may include up to four phases: concept exploration, demonstration and validation, full-scale development, and production and deployment). DOD systems are generally not coordinated with host nations until the production and deployment phase. Host nation frequency requirements are therefore not always considered in earlier acquisition decisions.

Of the applications submitted to the Federal Republic of Germany between 1977 and 1985, 64 percent, or 88 applications, were for systems in the production and deployment phase. For some of these systems, late coordination has resulted in (1) development of systems that were unusable in certain countries, (2) modifications to completed systems, and (3) restricted use of systems because host nation frequency requirements could not be met. For example, DOD fielded a joint U.S. Army and Air Force data system in Europe concurrently with a frequency application. Host nation officials did not approve the application because the system uses civil bands and potentially interferes with one of the

country's commercial systems. As a result, the system has to be modified to meet host nation requirements, which will delay its use in Europe. The modification will cost an estimated \$2.5 million or more

DOD officials gave various reasons for delayed coordination:

- Guidance does not specify in which stage of a system's acquisition coordination should take place.
- DOD may not be able to disclose system information if it contains business proprietary data, U.S. classified or restricted technological information, or for other reasons.
- Coordination with host nations on systems that are changing or may not ever become operational is detrimental to the frequency management process.
- System developed for use in one nation may be fielded later in another nation.

In addition to problems encountered because of late coordination, a 1984 U.S. Marine Corps review identified 53 different radar systems planned for employment without host nation coordination or approval. According to the U.S. European Command (USEUCOM) and host nation military officials, the uncoordinated and unapproved use of systems could cause, among other things, electromagnetic interference to other critical United States and allied systems and render systems inoperable or disrupt them during wartime. Our review in the Pacific theater established that provisions for effective wartime operations were incomplete because frequency coordination had not always occurred when required. The DOD Military Communications-Electronics Board, which provides frequency guidance, is also concerned about these potential problems.

In some cases, DOD minimized unnecessary cost by early coordination. For instance, through early coordination, the U.S. Air Force avoided fielding a radar system—estimated to cost \$20 million—which it could not use in Europe because requested frequencies fell into civil bands. DOD is redesigning the system with different frequencies.

## Coordination Process Needs Strengthening

Weaknesses in DOD's frequency coordination process increase the time it takes to gain allocations and delay the fielding of new equipment.

In many cases, written authority to release applications to host nations was not provided by the military departments until systems were in the production and deployment phase. Consequently, theater commander

and host nation comments on frequency requirements were not considered during development. The systems then had to be modified because they did not meet host nation requirements. Also, DOD uses frequency applications which do not always provide sufficient specific information to complete coordination with host nations. In one case, lack of release authority added over a year to the time required to prepare for and obtain a frequency allocation. DOD has recognized the need to strengthen the process and is taking some steps to do so.

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## Conclusions

Because DOD has generally processed requests for host nation coordination on frequency applications when communication systems are in the final stage of their acquisition cycle, systems were delayed for use in Europe, did not use their full capacity, or were required to have extensive and costly modifications. In some cases, systems were placed in Europe without coordination or approval from the host nation. Use of these systems could interfere with other critical systems or preclude their operation during wartime. Weaknesses in the coordination process have contributed to these problems. Our work in the Pacific theater confirms that the frequency coordination problem is more widespread than just systems placed in Europe.

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## Recommendations

We recommend that the Secretary of Defense change the DOD instruction dealing with system acquisition and frequency coordination to specify that host nation frequency coordination be initiated no later than a system's full-scale development phase. The Secretary should also direct that the secretaries of the military departments change their instructions to conform to the changed DOD instruction.

We also recommend that the Secretary direct the Chairman, Military Communications-Electronics Board, to strengthen management controls in the coordination process by:

- Requiring the military departments to routinely provide written authority to release frequency allocation applications and related documents to host nations for coordination before contracting for full-scale development.
- Ensuring that theater commander comments and available host nation comments are incorporated in frequency guidance to the military departments for the development, procurement, or modification of systems. When host nation comments are unavailable, the guidance should

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explain why, when they are expected to be obtained, and what the likely frequency problems facing the system will be.

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## Agency Comments

DOD comments on a draft of this report are included as appendix IV. We modified the report, where appropriate, to address DOD's concerns. DOD generally concurred with our findings and recommendations. DOD agreed that earlier host nation coordination should reduce acquisition costs and permit systems to operate at full capability.

DOD said frequency coordination with our allies, particularly for developmental systems, is a complex undertaking. Since it requires dealing with sovereign nations, part of the process is outside of DOD's control. Spectrum decisions are made on a system-by-system basis and must take into account restrictions on disclosing classified information, certain technological data, proprietary information, and other factors. Management decisions in these areas will continue to be part of the acquisition and equipment deployment process.

However, DOD officials agreed that corrective action is needed. They said that the DOD guidance will be revised to require initiation of host nation frequency coordination during the full-scale development phase of system acquisition and to adequately address spectrum support in the acquisition process and documentation. DOD officials also agreed that this improved process will alleviate some of the confusion, releasability problems, and delays of the old system. DOD stated that it had already accomplished a great deal in strengthening the frequency coordination process and will see this initiative to its conclusion.

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As you know, 31 U.S.C. 720 requires the head of a federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Secretaries of the Army, Navy, and Air Force; the Defense Communications Agency; USEUCOM; and the U.S. Pacific Command. Copies are also being sent to the Director, Office of Management and Budget; appropriate congressional committees; and other interested parties.

Sincerely yours,



Frank C. Conahan  
Assistant Comptroller General

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## Abbreviations

DOD Department of Defense  
USEUCOM U.S. European Command





# Earlier Radio Frequency Coordination With European Allies Could Improve System Use and Eliminate Unnecessary Costs

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## Background

Systems which transmit or receive electromagnetic energy must use the radio frequency spectrum.<sup>1</sup> Each nation owns the spectrum within its borders as a sovereign right. The spectrum can only be used with each nation's permission, which is obtained through frequency allocations and frequency assignments. Allocations involve determining (1) whether requested frequencies fall into the proper bands defined for the type of service the system provides and (2) whether sufficient spectrum space is available in those bands to support the system. When a nation grants frequency allocation approval, it normally means that the system will receive a specific frequency assignment when requested. Frequency assignments involve the authority to use specific frequencies at designated locations and within specific technical parameters. Both allocations and assignments are obtained through coordination with each nation where the systems will be deployed.

Coordination helps nations to plan and manage use of their radio frequency spectra. Because of the wide variations in the way nations divide their spectra and the steady demand for finite frequency space, individual frequency requests are difficult and time-consuming to obtain. Through coordination, host nations can make it more likely that new systems will operate compatibly with other systems in the same electromagnetic environment; sufficient spectrum space is available to support the system; selected frequencies conform to the frequency allocation tables; and systems comply with technical standards. Since nations can deny frequency requests, it is important to determine each host nation's frequency requirements before developing systems.

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## Early Coordination With Host Nations Could Reduce Costly Delays

Management controls in DOD guidance state that coordination with host nations should take place as early as possible during a system's acquisition cycle, which may include up to four phases: concept exploration, demonstration and validation, full-scale development, and production and deployment. DOD systems are generally in the last phase before they are coordinated with host nations. As a result, host nation frequency coordination comments are not always considered in earlier acquisition decisions.

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<sup>1</sup>By international agreement, the world is divided into regions for frequency spectrum purposes. Europe is in region 1 and the United States is in region 2. Within each region, the spectrum is divided into discrete frequency bands, with each band being allocated among fixed, mobile, satellite, broadcast, and other radio services. Regional breakdowns are listed in the International Telecommunications Union Allocation Tables, which serve as the basis for the National Tables of Frequency Allocations. Different allocations exist between regions and countries.

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**Appendix I  
Earlier Radio Frequency Coordination With  
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We tested key coordination controls by reviewing all United States frequency requests submitted to the Federal Republic of Germany from 1977 through 1985 to determine when DOD submitted frequency applications for foreign coordination. During that time, the United States submitted 137 requests, of which 88, or 64 percent, were submitted after systems had reached the production and deployment phase.

This has caused long and costly delays in availability for European employment for some of these systems after the systems had been developed because (1) the system did not operate compatibly with other systems using the spectrum, (2) no spectrum was available for the system to use at certain locations, or (3) the frequencies selected were not available. Normally, the alternatives were not to use the system at a specific location, change its operating frequencies, or negotiate a restricted operating use. The following are examples of systems coordinated after development or procurement that could not be used in the European theater or which required costly modification before receiving frequency allocations.

- DOD procured a modified commercial system and fielded it as a joint U.S. Army and Air Force intelligence data system known as UPQ-3B. It is used with the Guardrail airborne information collection platform in Europe. It was fielded concurrently with a frequency application. This procurement was not properly coordinated with United States frequency managers. Host nation officials would not approve the application because the system uses civil bands and could potentially interfere with one of the country's commercial systems. As a result, the system has to be modified to meet host nation requirements, which delayed its availability for use in Europe. The modification will cost an estimated \$2.5 million or more.
- The Air Force developed a Tactical Air Navigation ground station for worldwide use in contingency situations. About 40 stations were planned for use during exercises in Europe. In Europe these Tactical Air Navigation ground stations are also used to provide a capability for quick wartime restoration of base navigation facilities in the event fixed facilities are destroyed. Even though the system was designed and its frequencies coordinated to operate on either high or low band frequencies, the Air Force only procured high band antennas to keep total system size and weight at a minimum. In Europe, when the Tactical Air Navigation ground stations intended for restoration use were planned for peacetime exercise deployments, the system was denied high band frequencies because either none were available or the locations where the system would operate were already assigned low band frequencies.

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Host nations officials said that they would not assign scarce high band frequencies to those locations already having low band frequencies. Since the system was coordinated to use high or low band frequencies but only high band antennas were bought, it could not be used where only low frequencies were available. Because of technological advances permitting smaller antenna designs, the Air Force is now planning to procure all band antennas as well as system monitors at a total cost of \$5.7 million and will no longer use the high band antennas that were originally procured as part of the system and now cost \$29,800 each if procured separately.

When host nation frequency requirements are not met, most systems are granted frequency allocations under restricted operating conditions, such as the number of hours or where the system can operate. In addition, the systems may be restricted to wartime use only. These restrictions can adversely affect training, maintenance, or system reliability. The following are examples of systems that did not meet host nation frequency requirements and are used under restricted conditions.

- The guided bomb system (AN/AXQ-14) estimated to cost \$90 million, has not yet been approved for training use in central Europe. There were 104 systems fielded in Europe as of September 1985. During development in 1978, frequency managers knew and communicated to the developers that the selected frequencies fell into civil bands of the European countries in which it would operate, but the frequencies were not changed. The frequency application has been in host nation coordination for over 7 years. Regular training on the system is considered critical to maintain operator proficiency for wartime use. However, approval was granted to train on the system only in southern Europe. This proved to be a problem because redeployment of the system from its operational areas in central Europe was too costly, and the terrain and weather in southern Europe was not the same. Consequently, United States forces have not been able to train on this system in central Europe. DOD is considering the need and cost to modify the system to allow it to be used in central Europe.
- The U.S. Air Force requested host nation frequency coordination for the HAVE QUICK airborne radio system in October 1980, 6 months after production had already begun. The Air Force began placing the system in Europe in 1981. Since 1982 the host nations have allowed the U.S. Air Force limited use of the system. The system initially was not submitted to host nations for frequency approval because it was intended to be a temporary system and the United States did not want to transfer the technology. However, HAVE QUICK's replacement system (SEEK TALK)

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was canceled. The U.S. Air Force later developed HAVE QUICK improvements to achieve greater operating capabilities and ensure electromagnetic compatibility in the European theater. The frequency component of the improved system, called HAVE QUICK II, was coordinated with the European North Atlantic Treaty Organization nations during development, and is already authorized to operate in those nations. The authorized HAVE QUICK II system is being fielded in Europe. Eventually, the initial HAVE QUICK radios will be upgraded to the HAVE QUICK II, which will eliminate the HAVE QUICK restricted use problem.

In addition to the problem of late coordination, in some cases, DOD has used foreign frequency spectra without prior approval, as required by host nation agreements.

A 1984 U.S. Marine Corps review of 58 communications and electronic systems planned for employment in the European theater disclosed that two systems were approved for use theater-wide, two systems were approved for use in Germany only, one system was disapproved for use within the European theater, and 53 systems had not been submitted for approval. USEUCOM officials told us that once host nation coordination has been completed, some of the 53 systems will probably not be approved for use in Europe. Subsequently, Marine Corps officials issued guidance for obtaining frequency assignments for exercises in Europe. The Marine Corps also subsequently developed some procedures for host nation coordination to support periodic exercises in Europe. However, they have not yet coordinated the planned use of their electronic systems with the nations where they will be employed in wartime.

In addition, U.S. Air Force UPQ-3A and HAVE QUICK systems that were deployed to the European theater, and the Anti-Intrusion Alarm system (GSS-20) that was ready for use, did not have host nation approval. The frequency application for the UPQ-3A system was submitted for approval in 1979. The system was used in Europe as early as 1980, without an allocation from the host nation. The Air Force stated that the system was vital to the United States military operations, and there was no compelling reason to cease operation. At the time of our review, USEUCOM was trying to gain a temporary frequency assignment while waiting for final host nation comments.

The other system, HAVE QUICK, was being used in Europe on frequencies assigned for the United States use. The system had been granted a restricted training frequency allocation. Its replacement system, HAVE QUICK II, has been approved for full operational use. The GSS-20 alarm

system was fielded in Europe and is ready for operational use. However, when specific frequency assignments were requested, it was discovered that the system had not been coordinated with the host nations. Three of the four countries granted approval after coordination.

According to USEUCOM and host nation military officials, the uncoordinated and unapproved use of systems could cause electromagnetic interference to other critical United States and allied systems and render them inoperable or disrupt them during wartime. Also, it may make it difficult to obtain future approvals.

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### **Early Coordination Leads to Positive Results**

We selected three frequency allocation cases coordinated early in the development stage of the life cycle to illustrate the advantages of early coordination. These cases were coordinated during development of the system, which allowed DOD to consider host nation comments before making the final frequency selection. In two of the three cases, this improved the prospects for receiving a timely and favorable host nation response to an allocation request. For example:

- When the U.S. Army initiated coordination during development of its new combat net radio, the host nation raised several concerns to be resolved before they would consider a frequency allocation. USEUCOM frequency officials and the program office developed a strategy to address those concerns, which included advanced planning for field tests to demonstrate that the system could operate compatibly within the host nation. USEUCOM officials periodically conferred with host nation officials on DOD's actions. According to USEUCOM officials, all major concerns have been addressed, and they expect the system to receive an allocation before its planned fielding in 1987.
- A U.S. Air Force airborne radio system was fielded in Europe before host nation frequency coordination was completed and the system was not granted approval for wartime use. This experience led the U.S. Air Force to consult early with the host nation before selecting frequencies for a follow-on modified version of this system. As a result, the frequency allocation for the modified system was readily obtained when requested.
- Through early coordination, the U.S. Air Force identified a frequency problem with a \$20 million radar security system, thereby avoiding fielding a system it could not use in Europe. The frequency application was submitted during the system's developmental stage. The host nations denied the application after determining that the frequencies fell into civil bands and would interfere with other spectrum users. DOD

is redesigning the system with different frequencies, and a new application will be submitted for host nation coordination.

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### **Reasons for Late Coordination With Host Nations**

DOD frequency managers associated with the Military Communications-Electronics Board, which provides frequency guidance, identified several reasons why systems are not coordinated until the production and deployment stage. Controls for managing the coordination of frequencies in DOD guidance do not specify in which stage of a system's acquisition coordination should take place. Also, systems developed for use in one nation may be fielded later in another nation. Additionally, earlier coordination with host nations would inundate them with proposals for some systems that may not become operational. They also believe that changes to a frequency application while it is in coordination diminish the chances that the system will receive favorable host nation comments. They said that contractors and project managers are reluctant to submit early applications because they may compromise proprietary information, restricted technology, or national security information. However, DOD frequency managers agreed that host nation coordination must be done earlier in system development.

We believe these reasons do not justify the number of delays we noted in coordination. Host nation officials said that they would prefer earlier coordination so that when a frequency selected by the United States is unavailable, a substitute frequency can be identified in time to allow economical frequency changes in the system before full-scale production begins. In addition, earlier coordination with host nation governments for most systems need not involve excessive risks of compromise to proprietary or national security information because no matter when coordination occurs it only takes place between the United States and properly cleared host nation government officials.

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### **Strengthening Management Controls in the Coordination Process Would Help Prevent Delays**

DOD has an administrative process for coordinating frequency requests with foreign nations. Its purpose is to determine the policies, regulations, and other frequency requirements in all areas where the system will be deployed. Frequency coordination practices have contributed to delays in completing coordination and in fielding new equipment

The U.S. Military Communications-Electronics Board is responsible for providing the military departments with frequency guidance before funds are obligated to develop or procure new equipment. Technical

assistance on electromagnetic compatibility matters is provided to the Board by DOD's Electromagnetic Compatibility Analysis Center.

Frequencies are normally selected from those bands allocated to the service appropriate for the system being developed. Once selected, coordination with the nations where the system will be deployed indicates whether those frequencies can be accommodated. The Board bases part of its frequency guidance to the military departments on coordination comments.

When the system is used overseas, coordination involves review by both the United States and host nation frequency officials. The sponsoring military department program manager prepares the frequency application and supporting documents and, through its frequency management offices, submits them to the Board. The Board distributes all applications to a specified list of recipients, including USEUCOM, for comments as appropriate.

The military departments are required to prepare written authority to release the application data and related documents to host nations. Within the European theater, USEUCOM initiates coordination if it receives a military department's authority to release application data. The military departments do not always provide written authority for the release of data necessary to effect host nation coordination.

After receiving host nation comments, USEUCOM sends them to the military departments and the Board. The military department's frequency management office incorporates the comments in a memorandum which provides frequency guidance. The Board determines from the memorandum if the equipment can receive frequency support in its intended operational areas and ensures that the memorandum gives appropriate frequency guidance. The Board sends approved memorandum and any electromagnetic compatibility analyses to the military department that is developing the system. An approved Board frequency allocation authorizes the department to develop the system for subsequent operation in the frequency band specified.

We found that the management controls were inadequate because

- DOD does not require the United States and host nation frequency coordination to be initiated at the same time,



- the military departments sometimes do not include written release authority for host nation coordination with applications submitted to USEUCOM, and
- DOD frequency applications do not always provide sufficient operational information to complete coordination with host nations.

These procedural limitations can add considerable time to the process required to prepare for and obtain a frequency allocation. DOD has recognized the need to strengthen controls over the process and is taking some steps to do so.

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**Concurrent United States  
and Host Nation  
Coordination Is Needed**

As discussed previously, DOD does not generally initiate concurrent United States and host nation frequency coordination until the full-scale development phase when a system's intended use is known. Before this phase, coordination within the United States military is usually accomplished. Although it is appropriate to obtain host nation comments before entering into contractual agreements for full-scale development, this is sometimes accomplished too late in the acquisition cycle or not at all.

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**Release Authority Needed  
With All Applications  
Requiring Coordination in  
Europe**

The military department's delay in providing authority to release information contained in frequency applications increases the overall time it takes to obtain host nation comments. For example, USEUCOM had the mobile instrumentation system's frequency application ready for host nation coordination but did not receive the military department's written release authority for 8 months. In another case, lack of a releasable electromagnetic compatibility analysis study delayed host nation coordination of the Army's AN/TPQ-37 radar system for over a year. According to information provided by USEUCOM officials, there can be confusion at the military departments about what information is necessary for coordination. DOD officials said the confusion may result from different kinds of information packages sent to USEUCOM. One package is intended to solicit USEUCOM's comments. The other, which must be accompanied by release authority, is to solicit host nation comments. The USEUCOM officials said that not all of the information on applications is necessary for coordination and, in some cases, could harm the United States interests. DOD officials said they are now centralizing transmission of releasable documents to reduce confusion about departmental submissions.

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## **Improvements Needed in Frequency Applications**

DOD's allocation applications do not always provide the information necessary to complete host nation coordination. Currently, similar application formats are used for internal United States and host nation coordination. According to Federal Republic of Germany officials, host nations find it difficult to analyze a system's potential effect because the information provided on deployment location and operational use is too general and is incomplete. This occurs because in the full-scale development and early production phases, the information is preliminary data that has not been finalized by the developers or operational commands. In addition to matching technical parameters with the radio service being provided, host nations must also determine whether the system can operate compatibly at the locations and in the electromagnetic environment where it will be used. Current applications, however, do not clearly provide this information. The Board has drafted a new multisection application format to cover specific technical information, which can be used for both the United States and host nation coordination. The new sections include information on operational concept data and specific operating locations for the system.

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## **Conclusions**

DOD could potentially save time, effort, and money by changing management controls to require foreign frequency coordination early in the acquisition process for new systems. When host nation coordination is accomplished after new systems have become operational, some long-term and costly investments in systems have resulted for systems that could not be used or could not be used to their full capacity, or had to be modified because host nation requirements were not met.

In addition, systems being used overseas without host nation coordination and approval could cause interference with other critical systems during wartime and reduce their effectiveness.

Furthermore, frequency coordination comments could be obtained from host nations more efficiently if DOD strengthened management controls in its coordination process. Early and concurrent initiation of the United States and host nation coordination appears to be the best way to ensure that overseas frequency requirements are considered while new systems are being developed.

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## **Recommendations**

We recommend that the Secretary of Defense change management controls in the DOD instruction dealing with system acquisition and frequency coordination to specify that host nation frequency coordination

be initiated no later than a system's full-scale development phase. The Secretary should also direct that the secretaries of the military departments change their instructions to conform to the changed DOD instruction.

We also recommend that the Secretary direct the Chairman, Military Communications-Electronics Board, to strengthen management controls in the coordination process by:

- Requiring the military departments to routinely provide written authority to release frequency allocation applications and related documents to host nations for coordination before contracting for full-scale development.
- Ensuring that theater commander comments and available host nation comments are incorporated in frequency guidance to the military departments for the development, procurement, or modification of systems. When host nation comments are unavailable, the guidance should explain why, when they are expected to be obtained, and what the likely frequency problems facing the system will be.

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## Agency Comments

DOD comments on a draft of this report are included as appendix IV. We modified the report, where appropriate, to address DOD's concerns. DOD generally concurred with our findings and recommendations. DOD agreed that earlier host nation coordination should reduce acquisition costs and permit systems to operate at full capability.

DOD said frequency coordination with our allies, particularly for developmental systems, is a complex undertaking. Since it requires dealing with sovereign nations, part of the process is outside of DOD's control. Spectrum decisions are made on a system-by-system basis and must take into account restrictions on disclosing classified information, certain technological data, proprietary information, and other factors. Management decisions in these areas will continue to be part of the acquisition and equipment deployment process.

However, DOD officials agreed that corrective action is necessary and will be helpful. They said that the DOD guidance will be revised to require initiation of host nation frequency coordination during the full-scale development phase of system acquisition and to adequately address spectrum support in the acquisition process and documentation. DOD officials also agreed that this improved process will alleviate some of the confusion, releasability problems, and delays of the old system.

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DOD stated that it had already accomplished a great deal in strengthening the frequency coordination process and will see this initiative to its conclusion.

# Frequency Allocation Problems in the Pacific Theater

Our review at several commands in the Pacific theater established that effective wartime operations may be jeopardized because management controls had been circumvented. We found that, in some cases (1) host government coordination had not taken place before systems were fielded and (2) systems were being operated without host nation government approval. Pacific theater frequency management officers had differing opinions regarding coordinating frequency allocation requests with host nations in a timely manner. The frequency management officer at U.S. Forces, Korea said that the coordination process usually allowed enough time to obtain frequency allocations from host nation governments before a system became operational. However, other Pacific frequency managers said that they generally received frequency allocation requests for coordination with the host nation government after the systems were already in the last stage of acquisition. This made coordination with host nations difficult because by then the system's operating frequency bands were fixed and the flexibility to negotiate frequencies constrained.

The frequency management officers said another problem is that technical data contained in requests for frequency allocations are often sensitive and the services are sometimes hesitant to authorize release of the application to host governments. However, if sufficient or appropriate technical data are not contained in the frequency allocation request, frequency managers may not be able to provide host governments the technical information needed to justify a request. Consequently, approvals may be delayed or not granted.

DOD guidance does not define specific data requirements to be included in requests for frequency allocation, because DOD does not know what specific information each host nation government requires in each case. Pacific frequency management officers said that each host nation must be dealt with individually in terms of the information required to coordinate frequency allocations. Anticipating frequency availability without host government coordination is difficult because the host governments, in some cases, will not provide data on frequencies assigned to non-U.S. civil and military users. Commander in Chief, Pacific officials told us they were in the process of trying to formalize the specific technical data requirements for each Pacific ally and to gain access to each country's civil and military frequency data base.

To further complicate matters, frequency request instructions state that, during the initial stage of a frequency allocation application, the Electromagnetic Compatibility Analysis Center will perform a cursory

electromagnetic compatibility assessment. The results of this assessment make up part of the frequency request package which is sent to theater commanders for information. However, for systems in the Pacific theater, further indepth analysis had not always been performed when needed. For example, as of March 1986, the U.S. Commander in Chief, Pacific frequency manager said that an electromagnetic compatibility study had not been done for Regency Net equipment. This was considered important because the equipment was originally intended for use in Europe. The Regency Net system has now been approved for Pacific fielding, but host nation coordination has not yet been accomplished.

In addition, attempts have been made over the last 10 years to field a tropospheric scatter radio system in Japan that was previously developed for use in Europe. At one point, the radios had been delivered but were not used because the Japanese government denied frequency allocations because the system interfered with the Japanese telephone system. United States officials in Japan told us that a frequency availability study had not been performed before deploying the radios. Without such a study, program managers cannot be certain that a system will actually function as designed in the location in which it is planned for use.

# Objective, Scope, and Methodology

Our objective was to determine whether DOD's management controls over coordination of the use of radio frequencies for command, control, and communication systems ensured efficient and economical operations.

We reviewed management controls in DOD instructions dealing with systems acquisition and frequency coordination. We selected the European theater because it contains the largest concentration of United States forces outside the United States and has a crowded frequency spectrum. We reviewed a listing of the 137 cases coordinated with the Federal Republic of Germany from 1977 through 1985 to determine the stage in the development cycle that the frequency application was submitted for foreign coordination. We verified the data on the listing. Of 20 cases that frequency officials in Europe identified as having encountered difficulties in obtaining allocation approval, we selected 10 for review. We included four of these cases in this report as examples of the problems resulting from late coordination. We documented specific problems encountered with coordination, why the problems occurred, and any cost incurred to correct the problems to gain approval. We also selected cases coordinated in the development stage of the life cycle, and included them in this report to demonstrate the benefits of early coordination. During a recent communications interoperability audit in the Pacific theater, we noted a number of similar frequency management issues. Appropriate Pacific command, control, and communications officials and frequency managers were interviewed, but no detailed case analyses were performed.

In the United States, we contacted the Office of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence; the U S Military Communications-Electronics Board; the Army, Navy, and Air Force frequency management offices; the Electromagnetic Compatibility Analysis Center; and the program offices for several systems coordinated in Europe. Organizations contacted in the European theater include the European Command's Spectrum Management Branch and frequency liaison offices in Brussels, Belgium, and Bonn, West Germany, and the Army, Navy, and Air Force frequency management offices.

Our review was performed between December 1985 and October 1986 in accordance with generally accepted government auditing standards.

# Comments from the Assistant Secretary of Defense



COMMAND CONTROL  
COMMUNICATIONS  
AND  
INTELLIGENCE

ASSISTANT SECRETARY OF DEFENSE

WASHINGTON D C 20301-3040

5 NOV 1986

Mr. Frank C. Conahan  
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International Affairs Division  
US General Accounting Office  
Washington, DC 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report "RADIO FREQUENCIES: Earlier Coordination Could Improve System Use and Save Costs," dated October 3, 1986 (GAO Code 395040) - OSD Case 7142. The DoD generally concurs with the report findings and recommendations, but some clarifying information is needed.

The GAO report concludes that, because DoD has generally processed requests for host nation coordination on frequency applications when communications-electronics systems are in the final phases of acquisition, many systems were delayed for use, were used in reduced capacity, or were required to have extensive and costly modifications. In some cases, the GAO reports that systems were placed in host nations without coordination or approval from the host nation. The GAO observed that the use of these systems could interfere with other critical systems or preclude their operation during wartime. Weaknesses in the frequency coordination process have contributed to these problems.

In general, the DoD agrees that earlier host nation coordination should reduce acquisition costs and permit U.S. systems to operate at full capability. Department of Defense guidance will be revised to require host nation frequency coordination be initiated during the full-scale development phase of system acquisition and that spectrum support be adequately addressed in the acquisition process and documentation. The DoD has already accomplished a great amount in strengthening the frequency coordination process and will see that initiative to its conclusion. This improved process will alleviate some of the confusion, releasability problems, and delays of the old system and help to get earlier frequency guidance from the Unified Commanders and host nations.



**Appendix IV  
Comments from the Assistant Secretary  
of Defense**

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Frequency coordination with the allies, particularly on developing systems, is a complex undertaking. Since the DoD is dealing with sovereign nations, part of the process is outside of our direct control. Spectrum decisions are made on a system-by-system basis and must take into account restrictions on disclosing classified information, certain technological data, proprietary information, and other factors. Management decisions in these areas will continue to be part of the acquisition and equipment deployment process.

Detailed Department of Defense comments on the GAO findings and recommendations are attached. The opportunity to comment on the draft report is appreciated.

Sincerely,



Donald C. Latham

Attachment  
as stated

**Appendix IV  
Comments from the Assistant Secretary  
of Defense**

GAO DRAFT REPORT - DATED OCTOBER 3, 1986  
(GAO CODE 395040) - OSD CASE 7142

**"RADIO FREQUENCIES: EARLIER COORDINATION COULD  
IMPROVE SYSTEM USE AND SAVE COSTS"**

**DEPARTMENT OF DEFENSE COMMENTS**

\* \* \* \* \*

**FINDINGS**

**FINDING A: Host Nation Frequency Allocation Approval.**

The GAO reported that the radio communication spectrum within a nation's borders may only be used with that nation's permission, which is obtained through frequency allocations and frequency assignments. The GAO further reported that, when a nation grants frequency allocation approval, it normally means that the approved system will receive a specific frequency assignment when requested. The GAO found that both allocations and assignments are obtained through coordination with each host nation where the systems will be deployed. The GAO concluded that, since nations can deny frequency requests, it is important to determine each host nation's frequency requirement before developing systems.

DOD Response: Partially Concur.

Many systems are not developed for a specific theater or country. During the concept exploration and demonstration and validation phases, the research and development community is working to satisfy a Required Operational Capability (ROC) which is a general statement of the requirements for the system. It typically does not identify specific theaters or nations for employment of the system. The initial need of the acquisition management community is to obtain spectrum support from US frequency authorities so that concept development can commence. During these early phases, advice is provided by the frequency management community as to the feasibility of using this equipment in certain theaters and nations. Normally, the full-scale development phase has begun before the system is sufficiently defined to seek specific host nation approval. Therefore, it may not be appropriate or possible to determine host nation's frequency requirements before developing systems, as the GAO suggests.

Although DOD acquisition and frequency management guidance is not specific as to when host nation coordination should take place, it does state that applications should be coordinated as early as possible in a system's acquisition. DOD follows this guidance in processing frequency applications.

Following current DoD guidance, there are many examples of early host nation frequency coordination. The GAO draft report cites three examples in Finding E.

DoD Directive (DoDD) 4650.1, "Management and Use of the Radio Frequency Spectrum," states that "DoD Components shall obtain radio frequency guidance prior to assuming contractual obligations with respect to either the development or procurement of telecommunications equipment designed purposely to radiate or receive electromagnetic energy. Radio frequency guidance will also be obtained prior to assuming obligations for the selection, procurement, or development of earth or terrestrial stations, sites, and facilities which will be used to support telecommunications equipment. This guidance will be obtained from the Military Communications-Electronics Board (MCEB)...."

DoD Instruction (DoDI) 5000.2, "Major System Acquisition Procedures," includes electromagnetic spectrum and other spectrum allocation as a consideration in planning system acquisitions.

The DoD will revise DoDD 4650.1, and DoDI 5000.2 to specify that host nation frequency coordination be initiated, for nations where it is intended the equipment will be deployed, as early as practical. In any case, this coordination will be accomplished prior to contracting for a system's full-scale development.

To assure frequency spectrum support, including host nation coordination, is properly considered during the acquisition of communications-electronics systems, the DoD will ensure spectrum support is documented as appropriate in the Decision Coordinating Paper prepared by the Services and is considered at milestone review meetings of the Joint Requirements and Management Board (JRMB).

The DOD response to Recommendation 1 contains additional details.

**FINDING B: Early Coordination With Host Nations Could Reduce Costly Delays.**

The GAO found that, although the DoD acquisition and frequency management guidance is not specific as to when host nation coordination should take place, it does state that applications should be coordinated as early as possible in a system's life cycle. (The GAO noted that a system's life cycle may include up to four stages: conceptual, experimental, developmental, and operational.) In reviewing all United States

frequency requests submitted to the Federal Republic of Germany from 1977 through 1985, the GAO found that during that time the United States submitted 137 requests, of which 88, or 64 percent, were submitted after systems were operational. The GAO found that this has caused long and costly delays in availability for European employment after the systems had been developed because (1) the system did not operate with other systems using the spectrum, (2) no spectrum was available for the system to use at certain locations, or (3) the frequencies selected were not available. The GAO found the following examples of systems coordinated after development or procurement.

-- The GAO found that the DoD procured a modified commercial system as a joint US Army and Air Force intelligence data system (UPQ-3B) and fielded it concurrently with a frequency application. The GAO observed that this procurement was not properly coordinated with United States frequency managers, and that host nation officials would not approve the application because the system used civil bands and interfered with one of the country's commercial systems. As a result, the system had to be modified (at a cost estimated to be \$2.5 million or more) to meet host nation requirements, which delayed its availability for use in Europe.

-- The GAO found that the Air Force developed a man portable, Tactical Air Navigation (TACAN) ground station for worldwide use in contingency situations. The GAO reported that the system's frequencies were coordinated to operate on either high or low band frequencies, but the Air Force later only procured high band antennas to minimize system size and weight. The GAO found, however, that in Europe, when the TACAN ground stations were planned to be used for peacetime exercise deployments, the system was denied high band frequencies because either none were available or the locations where the system would operate were already assigned low band frequencies. The GAO observed that the Air Force is, therefore, now planning to procure all-band antennas as well as system monitors, at a cost of \$5.7 million.

-- The GAO also found that the US Air Force requested host nation frequency allocation for the HAVE QUICK airborne radio system six months after production had begun, because it was initially intended as a temporary system and the US did not want to transfer the technology. The GAO reported that the system was granted restricted approval for training use but not for wartime use, because it could not operate compatibly with other systems in the intended environment. The GAO observed that, as a result, the Air Force modified HAVE QUICK to provide

greater operating capabilities and ensure electromagnetic compatibility in the North Atlantic Treaty Organization (NATO) theater. The GAO noted that the frequency component was coordinated with NATO nations, received a frequency allocation and is now operated in NATO.

The GAO further concluded that, when host nation coordination is accomplished after new systems have become operational, some long-term and costly investments in systems have resulted for systems that could not be used, or could be used only in a reduced capacity, because host nation requirements were not met. The GAO concluded that the DoD could improve system use and potentially save millions of dollars by requiring foreign frequency coordination during the developmental stage of new systems.

DoD Response: Partially Concur.

The GAO refers to "the system's life cycle stages: conceptual, experimental, developmental, and operational." Instead of a "system's life cycle stages", the proper DoDD 5000.1, "Major System Acquisitions," terminology is to refer to the "system acquisition process" consisting of "four distinct phases: concept exploration, demonstration and validation, full-scale development, and production and deployment."

The statement that the United States submitted 137 requests to the Federal Republic of Germany from 1977 to 1985, of which 88, or 64 percent, were submitted after systems were operational should read "...were submitted in the production and deployment phase."

The statement that "The GAO found that this has caused long and costly delays in availability for European employment after the systems had been developed..." is misleading. While this may be true in some cases, there is no information in the report to indicate how many of the 88 systems that were submitted in the production and deployment phase were adversely impacted by the late coordination. Only four examples are cited in the report. The magnitude of the problem is not defined without this information. Information in Appendix III of the GAO report is also inconclusive. Also, the report covers the period 1977 until 1985. There is no information in the report that tells when these problems occurred or if DoD improved the process during this period. It is the DoD position that the process has, in fact, been improved significantly during this time.

Concerning the UPQ-3B finding, the GAO observed that "the system used civil bands and interfered with one of the country's commercial systems." This should read "used civil bands and potentially interferes with..." because no tests were done to prove interference.

Concerning the HAVE QUICK finding, the GAO reported that the system was granted restricted approval for training use but not for wartime use, because it could not operate compatibly with other systems in the intended environment. In reality, incompatibility was never proven. The DoD did not want to spend the funds required to determine compatibility since HAVE QUICK II --the modification to HAVE QUICK -- was soon to be fielded. The GAO observed that, the Air Force modified HAVE QUICK to provide greater operating capabilities and ensure electromagnetic compatibility in NATO. This statement should read, "While NATO electromagnetic compatibility was an added benefit of HAVE QUICK II, the modification expanded the radio's frequency hopset primarily in response to the increasing threat."

The GAO concludes that DoD will improve system use and potentially save millions of dollars by requiring foreign frequency coordination during the full-scale development phase. Because each case is unique, the DoD is unable to generalize on potential savings resulting from earlier coordination.

See the DoD response to Finding A for corrective actions being taken.

FINDING C: Restricted Operating Conditions.

The GAO found that when host nation frequency requirements are not met, most systems are granted frequency allocations under restricted conditions and, in addition, the systems may be restricted to wartime use only. The GAO cited, for instance, the guided bomb system (AN/AXQ-14) estimated to cost \$90 million, which has not yet been approved for its intended use in Central Europe. The GAO reported that during development, it was known by frequency managers and communicated to the developers that the selected frequencies fell into civil bands, but they were never changed. The GAO reported that, as a result, the frequency application has been in host nation coordination for over seven years. In addition, the GAO found that regular training on the system is considered critical to maintain operator proficiency for wartime use, but approval was granted to train on the system only in Southern Europe. The GAO observed it was informed by frequency managers that it will cost

more than \$10 million to change the frequencies as required to gain an allocation, and that DoD is considering the need to modify the system to allow its intended use in Europe. The GAO concluded that restricted use of a system can have a major effect on the operational requirements.

DoD Response: Partially Concur.

The intended use of the AN/AXQ-14 system occurs during wartime. Only training has not been approved in Central Europe.

"The GAO observed it was informed by frequency managers that it will cost more than \$10 million to change the frequencies as required to gain an allocation..." The DoD notes that frequency managers are not qualified to estimate the costs of system modifications.

See DoD response to Finding A for corrective action being taken.

FINDING D: Use of Foreign Frequency Spectrums Without Prior Approval.

The GAO found that, in a 1984 review of 58 US Marine Corps radar systems planned for employment in the European theater, the United States European Command (USEUCOM) reported that two systems were approved for use theater-wide, two systems were approved for use in Germany only, one system was disapproved for use within the European theater, and 53 systems had not been submitted for approval. The GAO also noted that USMC officials subsequently issued guidance for obtaining frequency assignments for exercises in Europe. The GAO also found that, in addition, US Air Force UPQ-3A and HAVE QUICK systems (which were being used in the European theater) and the Anti-Intrusion Alarm system (GSS-20) (which was ready for use) did not have host nation approval. The GAO concluded that the uncoordinated and unapproved use of systems may cause electromagnetic interference to other critical systems and render them inoperable and, in addition, may make it difficult to obtain future approvals.

DoD Response: Partially Concur.

As a result of its 1984 review, the USMC has taken action to identify host nation frequency requirements in the acquisition of future communications-electronics systems. Of the 53 systems that had not been submitted for approval in 1984, some are now obsolete. Others that are to be employed in Europe are in the process of being coordinated.

UPQ-3A may be based in nations that have not given final approval for peacetime use, but active training is not performed in those nations.

The GAO references to HAVE QUICK in this finding confuse HAVE QUICK and HAVE QUICK II. See DOD comments on Finding B for clarification. HAVE QUICK II has host nation approval for operational use.

See DOD response to Finding A for corrective action being taken.

FINDING E: Early Coordination Leads To Positive Results.

The GAO found three frequency allocation cases coordinated early in the development stage of the life cycle out of 20 cases identified by USEUCOM frequency officials. The GAO observed that, in two of the three cases, this improved the prospects for receiving a timely and favorable host nation response to an allocation request.

-- The GAO found that, when the US Army initiated coordination during development of its new combat net radio, the host nation raised several concerns to be resolved before it would consider a frequency allocation. The GAO found that USEUCOM frequency officials and the program office developed a strategy to address those concerns (including advanced planning for field tests to demonstrate that the system could operate compatibly). The GAO noted that, according to the USEUCOM officials, all major concerns had been addressed and they expected the system to receive an allocation before its planned fielding in 1987.

-- The GAO found that US Air Force airborne radio coordination was completed, but the system was not granted approval for wartime use. The GAO reported that this led the US Air Force to consult with the host nation before selecting frequencies for the modified system, and as a result, the frequency allocation for the modified system was readily obtained when requested.



-- The GAO also found that, through early coordination (during the development phase of the system), the US Air Force identified a frequency problem with a \$20 million radar security system, thereby avoiding fielding a system it could not use in Europe. The GAO reported that the host nations denied the application after determining that the frequencies fell into civil bands and would interfere with other spectrum users. According to the GAO, as a result the DoD is redesigning the system with different frequencies.

The GAO concluded that in some cases the DoD has minimized unnecessary cost by early coordination.

DoD Response: Concur.

Specific comment cannot be provided since the systems have not been identified in the report. The second example appears to be HAVE QUICK II, the same example used in Finding B.

See DoD response to Finding A for corrective action.

FINDING F: Reasons For Late Coordination With Host Nations.

The GAO noted that DoD officials gave various reasons for delayed coordination. The GAO cited the following as examples:

- guidance does not specify in which stage of a system's life cycle coordination should take place;
- DoD does not want to disclose system information because it is considered business proprietary data, US classified or restricted technology information, or for other reasons;
- coordination with host nations on systems that are changing or may not ever become operational is detrimental to the process; and
- a system developed for use in one location is fielded later in a different location.

The GAO noted, however, that host nation officials stated that they would prefer earlier coordination so that when a frequency described by the United States is unavailable, a substitute frequency can be identified in time to allow economical frequency changes in the system before full-scale

production begins. In addition, the GAO concluded that earlier coordination with host nation governments for most systems need not involve excessive risks of compromise to proprietary or national security information because no matter when coordination occurs, it only takes place between the United States and properly cleared host nation government officials. The GAO also concluded that the reasons cited by DoD officials do no warrant the number of delays noted in coordination. Finally, the GAO concluded that the advantages of early coordination normally outweigh the disadvantage cited by DoD management officials.

DoD Response: Partially Concur.

The DoD notes that frequency coordinations may be late, not when a "system developed for use in one location is fielded later in a different location," as found by the GAO; but, rather, when a system developed for use in one nation is fielded later in an additional nation.

The GAO report makes release of system information sound dependent on the whim of DoD personnel. Release of proprietary data and US classified or restricted technology information is governed by law and regulation. Frequency allocation applications are processed as soon as possible following a request by the developer for frequency allocation. The releasability of technical data comes under the purview of the Services. Frequency coordinations must be consistent with existing technology transfer laws and applicable security procedures. The MCEB processes releasable applications as soon as they are received.

While the DoD supports early host nation coordination, early coordination is not without its attendant problems. Host nation coordination is based on international cooperation between sovereign states. The Federal Republic of Germany has complained in the past about our presenting them with preliminary data, then later submitting revised data. This problem, associated with premature coordination, tends to reduce cooperation of foreign frequency managers and may have adverse impact to the frequency management process over the long term.

The GAO conclusion that the advantages of early coordination normally outweigh the disadvantages cited by DoD management officials is a generalization. Such determinations can only be made on a case-by-case basis.

See DoD response to Finding A for corrective action.

FINDING G: Strengthening The Coordination Process Would Help Prevent Delays.

The GAO reported that the US Military Communication-Electronics Board (the Board) is responsible for providing the Military Departments with frequency guidance before funds are obligated to procure new equipment. The GAO found that the Board distributes frequency applications for comment and that USEUCOM receives all of these applications for the European Theater. The GAO further found, however, that USEUCOM must have written authority from the Military Department submitting the application in order to submit data to the host nation for comment. The GAO found that the Board bases part of its frequency guidance on the comments that are received, and that an approved Board frequency allocation authorizes the Military Department to develop the system for subsequent operation in the frequency band specified. The GAO concluded that strengthening the coordination process (as noted in Findings H, I, and J) would help prevent delays.

DOD Response: Concur.

See DOD responses to Findings I and J and Recommendations 2 and 3 for discussions of corrective action.

FINDING H: Concurrent United States And Host Nation Coordination Is Needed.

The GAO found that coordination within the United States frequency offices is generally accomplished before host nation coordination. The GAO found that the former is to provide United States guidance to permit programs to meet the earlier milestones of system development. The GAO found, however, that obtaining the host nation comments, due to the time required for host nation coordination, is sometimes accomplished too late in the acquisition cycle, or not at all, and that this increases the overall time required to receive all coordination comments and to complete the process. The GAO concluded that concurrent United States and host nation coordination is needed.

DOD Response: Partially Concur.

The GAO found that US coordination is generally accomplished before host nation coordination to provide US guidance to permit programs to meet their earlier milestones. It should be added that, although every effort is made to get early host nation comments, frequency applications are sometimes held up due to releasability considerations. This is the prime reason for late initiation of host nation coordination.

Concurrent US and host nation coordination should be initiated not later than a system's full-scale development phase. Prior to the full-scale development phase, system definition will be insufficient to permit host nation coordination in many instances. Since host nation coordination can consume an unacceptable amount of time in the development of a system, concurrent finalization of both US and host nation coordination could unacceptably delay development of systems vital to the US defense. US spectrum managers' comments should not be withheld from the development community pending the arrival of host nation comments.

See DoD responses to Recommendations 2 and 3 for corrective action.

FINDING I: Release Authority Needed With All Applications Requiring Coordination In Europe.

The GAO found that the Military Department's delay in providing authority to release information contained in frequency applications increases the overall time it takes to obtain host nation comments. The GAO cited, for example, USEUCOM had the frequency application ready for host nation coordination of the mobile instrumentation system, but did not receive the Military Department's written release authority for eight months. In another case, the GAO found that lack of a releasable electromagnetic compatibility analysis study delayed host nation coordination of the Army's AN/TPQ-37 radar system for over a year. According to information provided by USEUCOM officials, the GAO observed that there apparently can be confusion at the Military Departments about what information is necessary for coordination. The GAO also noted that DoD officials said the confusion may result from the different kinds of information packages sent to USEUCOM--i.e., one package is intended to solicit USEUCOM's comments, the other, which must be accompanied by release authority, is to solicit host nation comments. The GAO noted that the USEUCOM officials also said that not all of the information on applications is necessary for coordination and, in some cases, its release could harm the United States' interest. The GAO reported that DoD officials said they are now centralizing transmission of releasable documents to ease confusion about departmental submissions. The GAO concluded that better coordination of release authority is needed.

DoD Response: Partially Concur.

The AN/TPQ-37 is a commercial competitor within NATO with a similar system manufactured by the Federal Republic of Germany (FRG). The AN/TPQ-37 operates in a band specifically recognized by the FRG as reserved for radar locating systems such as the AN/TPQ-37.

Allied Communications Publication (ACP) 190, "Guide to Frequency Planning," US Supplement 1(B), Chapter 5, requires the Unified Commanders (CINCs) be solicited for comments on frequency allocations. A DD Form 1494, "Application for Equipment Frequency Allocation," for each piece of DoD equipment developed is forwarded to the CINCs for comment. Based on familiarity with Region Radio Regulations, the theater personnel are required to provide comments or advice to the MCEB. At this stage, these documents are purely national documents. When it is determined that equipment will be used in a specific foreign country, a separate form, which is releasable, is forwarded to the CINC for host nation coordination. The releasable document can only be prepared after the developer has provided the releasable information to the frequency management community. This information must be in accordance with the security classification guide for the specific equipment. The CINCs are aware that documents releasable to host nations contain a unique designation and are forwarded by the MCEB along with a statement that the unique form is releasable. This procedure, begun about 12 months ago, answers this finding. ACP 190, US Supplement 1(B), being reviewed, will be amended to reflect this procedure now in use.

FINDING J: Improvements Needed In Frequency Applications.

The GAO found that the DoD allocation applications do not always provide the information necessary to complete host nation coordination. The GAO noted that, currently similar application formats are used for internal United States coordination and host nation coordination. The GAO reported, however, that, according to Federal Republic of Germany officials, host nations find it difficult to analyze a system's potential effect because the information provided on deployment location and operational use is too general and is incomplete. The GAO noted that the Board has drafted a new multisection application format to cover specific technical information, which can be used for both the United States and host nation coordination. The GAO observed that the new sections include information on operational concept data and specific operating locations for the system. The GAO concluded that improvements are needed in the frequency application itself.

DoD Response: Concur.

The DoD notes that the GAO reported host nations sometimes find it difficult to analyze a system's potential effect because information on development location and operational use is too general and incomplete. The physical characteristics of a system and operational concepts for its use are likely to change during acquisition. Earlier submission for host nation coordination involves the potential for even more general data.

DD Form 1494, "Application for Equipment Frequency Allocation," provides a separate cover page for national and host nation submissions. The host nation cover sheet includes format lines for those items the CINCs and host nations require (for example: operational concept, planned deployment locations, and schedule, etc.). This new form was recently approved by The Office of Management and Budget for use. The form meets all national and host nation requirements. We expect it to be in use within three months.

FINDING K: Frequency Allocation Problems In The Pacific Theater.

The GAO found that in the Pacific theater (in some cases), host government coordination had not taken place before systems were fielded, and that systems were being operated without host government approval. The GAO reported that frequency management officers stated that another problem is that technical data contained in requests for frequency allocations are often sensitive, and the Services are sometimes reluctant to authorize their release to the host countries. In addition, the GAO reported that Pacific frequency management officers stated that each nation must be dealt with individually in terms of information required. Also, in the Pacific, the GAO noted that some governments will not provide data on frequencies assigned to non-US civil and military uses, and that Commander-in-Chief Pacific officials said they were trying to gain access to each country's civil and military frequency database. The GAO also found that, for systems in the Pacific theater, in-depth analysis had not always been performed in connection with the Electromagnetic Compatibility Analysis Center's electromagnetic capability assessment. Finally, the GAO found that attempts have been made over the last ten years to field a tropospheric scatter radio system in Japan that was previously intended for use in Europe. The GAO noted that, at one point, the radios had been delivered, but were not used because the Japanese government denied frequency allocations on the basis the system interfered with the Japanese telephone system. The GAO also

noted that United States officials in Japan stated that a frequency availability study had not been performed before deploying the radios. The GAO concluded that, without such a study, program managers cannot be certain a system will actually function as intended in the location in which it is planned for use. The GAO further concluded that its work in the Pacific theater confirmed that the frequency allocation problem is more widespread than merely for systems placed in Europe.

DOD Response: Concur.

The Pacific area experiences many of the same problems as found in Europe. To compound the problems, the Pacific is not organized like NATO. Without an agency like NATO's Allied Radio Frequency Agency (ARFA), which centralizes host nation processing, the Pacific frequency community often has difficulty determining which Pacific nations are required to coordinate on a given system.

See DOD responses to Findings A, H, I, and J for a discussion of corrective action.

#### RECOMMENDATIONS

##### RECOMMENDATION 1:

The GAO recommended that the Secretary of Defense direct DOD (OSD) and Military Service instructions dealing with system acquisition and frequency coordination specify host nation frequency coordination be initiated by no later than a system's developmental stage.

DOD Response: Partially Concur.

The DOD agrees with this recommendation if the last sentence is changed to read: "...host nation frequency coordination be initiated prior to contracting for full-scale development." This is the proper DoDD 5000.1 terminology.

The DoD will revise DoDD 4650.1 and DoDI 5000.2 to specify host nation frequency coordination be initiated, for nations where it is intended the equipment will be deployed, as early as practical. In any case, this coordination will be accomplished by no later than a system's full-scale development phase. An attempt will be made to incorporate this change in the revision to DoDI 5000.2 now being staffed. Revisions to DoDI 5000.2 will be incorporated in Service guidance within 90 days of publication.

The Assistant Secretary of Defense (Command, Control, Communications and Intelligence) will initiate revision of DoDD 4650.1 by 31 December 1986.

To assure frequency spectrum support including host nation coordination is properly considered during the acquisition of communications-electronics systems, the DoD will ensure spectrum support is documented as appropriate in the Decision Coordinating Paper prepared by the Services and is considered at milestone review meetings of the JRMB. Implementation will be by USJ(A) letter to Services, JCS, and USD(A) staff, to be issued by 31 December 1986.

RECOMMENDATION 2:

The GAO recommended that the Secretary of Defense direct the Chairman, Military Communications-Electronics Board, to require the Military Departments to routinely provide written authority to release frequency applications and related documents to host nations for coordination concurrent with initial submission of frequency applications to the Military Communications-Electronics Board.

DoD Response: Partially Concur.

The DoD agrees with this recommendation clarified as follows: the recommendation should read "...to host nations for coordination concurrent with initial Stage III submission of frequency applications." Stage III applications are submitted prior to contracting for a system's full-scale development. These applications are in two versions, one for US use and a releasable version for host nation use. This is consistent with Recommendation 1.

Frequency allocations applications are processed as soon as possible following a request by the developer for frequency allocation. The releasability of technical data comes under the purview of the Services. Frequency coordinations must be consistent with existing technology transfer laws and applicable security procedures. The MCEB processes releasable applications as soon as they are received.



APC 190, US Supplement 1(8), will be amended to include more explicit procedures for processing the DD Form 1494. This amendment will be completed by July 1987.

RECOMMENDATION 3:

The GAO recommended that the Secretary of Defense direct the Chairman, Military Communications-Electronics Board, to ensure that theater commander comments and available host nation comments are incorporated in frequency guidance to the Military Departments for the development and procurement of new systems. (The GAO noted that when host nation comments are unavailable, the guidance should explain why, when they are expected to be obtained, and what the likely frequency problems facing the system will be.)

DOD Response: Concur.

See DOD response to Recommendation 2 for corrective action.



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