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JOINT OPERATIONS IN THE ELECTROMAGNETIC BATTLESPACE

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CHAIRMAN OF THE JOINT CHIEFS OF STAFF
MANUAL

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JOINT OPERATIONS IN THE ELECTROMAGNETIC BATTLESPACE

References: Appendix F lists references a through s

1. Purpose. To standardize techniques, and procedures for planning, coordinating, and controlling spectrum-use in joint operations.

2. Cancellation. None.

3. Applicability. This publication applies to all joint task force (JTF) operations, and provides planners, decision makers, and spectrum users with operation and planning guidance.

4. Policy. Controlling the electromagnetic battlespace is key to successful military operations. This publication will guide the JTF establishing authority, the Joint Force Commander (JFC) and staff, and subordinate commanders and staff in planning, coordinating, and controlling the electromagnetic battlespace (EMB).

5. Definitions. See Glossary.

6. Responsibilities. See Chapter 2.

7. Request for Changes. Change recommendations to this manual should be forwarded to:

Director, Joint Staff J-6, C4
ATTN: J6B
Pentagon, Room 1E833
Washington, D.C. 20318-6000

7. Effective Date. This manual is effective upon receipt.

For the Chairman of the Joint Chiefs of Staff:

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LIST OF EFFECTIVE PAGES

The following is a list of effective pages for CJCSM 3220.01. Use this list to verify the currency and completeness of the document. An "O" indicates a page in the original document.

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2-1 thru 2-6	O	C-1 thru C-4	O
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Change No.	Date of Change	Date Entered	Name of Person Entering Change

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SECTION I

PREFACE

1. Purpose. This publication provides guidance on tactics, techniques, and procedures for planning, coordinating, and controlling use of the electromagnetic battlespace (EMB) in a joint task force (JTF) environment. Information and procedures contained herein will standardize EMB spectrum operations for JTFs.

2. Scope

a. Command and control (C2) of military forces across global distances and expanded areas of operation (AOs) demand a continuous flow of information. Information flow in the highly mobile military operating environment depends heavily upon controlling and exploiting the use of the electromagnetic spectrum throughout the range of military operations. The guidance contained herein is based on the concept that effective and efficient spectrum use and management are attained through the principles of planning, coordination, and control.

b. The effective use and control of the spectrum is critical to the national security in terms of Information Warfare (IW) and combat operations in terms of Command and Control Warfare (C2W). Effective spectrum management (the organized control and use of the electromagnetic spectrum) is a building block of defensive Information Operations (IO) and C2 Protect to ensure that necessary operations can be conducted with minimal unintentional interference (fratricide) and without electromagnetic environmental effects (E3) to ordnance. The rapid growth of sophisticated weapons systems, as well as intelligence, operations and communications systems, will increase demand for frequencies that, if not coordinated and carefully preplanned, will have an adverse effect upon friendly but competing users. Operations must also consider the needs of all forces in future contingencies. Therefore, an effective spectrum management structure is required not only to satisfy the spectrum needs of military users, but also to coordinate with host nations to facilitate effective use of this finite resource.

c. The diffusion of spectrum use throughout enemy, host-nation, United Nations (UN), allied, and coalition forces, as well as by US forces, dictates that spectrum-use planning for a military operation be timely, thorough, and comprehensive. Electromagnetic wave propagation does not stop at arbitrary boundaries, such as areas of responsibility (AORs), theaters, and so forth. Therefore, coordination with all friendly and neutral parties vulnerable to electromagnetic interference (EMI) is essential. Such coordination will ensure that friendly emissions do not conflict with, and that unacceptable EMI does not adversely affect, contemplated operations.

d. Ultimately, total control of the EMB is the key to successful military operations. The ultimate goal of spectrum-use planning and management is to control the spectrum so that it is available and serves the information needs of US, UN, allied, and/or coalition forces and to deny the enemy the use of the spectrum so that he is unable to command, control, or otherwise employ his forces effectively. Implementing this concept requires a central authority to ensure the effective use of the spectrum by friendly forces while integrating other actions that deny spectrum use to adversary forces. The J-6 Joint Frequency Management Office (JFMO) is the focus of this central authority.[1]

3. Applicability

[1] Includes the functions of the office and the tasks and actions of individuals assigned to the JFMO.

a. This publication provides planners, decision-makers, and spectrum users with joint spectrum management guidance when the JTF is the selected command organization. The publication is intended to aid and guide the JTF establishing authority, JTF commanders and staffs, and JTF component commanders and staffs in planning, coordinating, and controlling use of the EMB in the JTF operating environment.

b. Use of the electromagnetic spectrum is pervasive in military operations and in all functional areas and echelons of command, often in competing ways. Therefore, an effective spectrum management structure is necessary not only to satisfy the spectrum needs of military users, but also to coordinate with host nations to facilitate effective employment of this finite resource. The selection of a command organization to execute a contingency operation or crisis action depends primarily on the mission to be accomplished and the objectives to be attained. The use of a JTF is considered the most appropriate for short-notice, time-sensitive, contingency, crisis action, or special operations (relief, evacuation) expected to be of limited duration.

4. Implementation Plan. This CJCSM defines the guidelines and procedures established by CJCSI 3220.01, Electromagnetic Spectrum Use in Joint Military Operations. It replaces Joint Publication 4.02.

a. Notice

1) This publication reflects current official Service doctrine, C2 organizations, facilities, personnel, responsibilities, and procedures. Changes in Service protocol will be incorporated in revisions. Significant changes requiring out-of-cycle updates will be made by interim message.

2) Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

SECTION II

EXECUTIVE SUMMARY

1. Joint Operations in the Electromagnetic Battlespace. Reference c details the CJCS policy on EMB in joint military operations. This publication standardizes the implementation of that policy at the JTF. This publication provides guidance and procedures for effecting EMB coordination and control involved in planning, deploying, employing, and redeploying a JTF. The six chapters herein guide spectrum planners, decision makers, and users at the commander in chief (CINC)/JTF level through the organization of a JTF. They also outline the responsibilities associated with spectrum management.

2. Command Relationships in a Joint Task Force. Chapter 1 describes the mission requirements and organizational structure of a joint task force. It addresses the command relationships and responsibilities of commanders and staffs associated with forming and leading a JTF.

3. Spectrum Management Relationships. Chapter 2 describes duties and responsibilities relating to spectrum management throughout the chain of command in the JTF environment. It specifically addresses the responsibilities of the JFMO and joint commander's electronic warfare staff (JCEWS).

4. Planning. Chapter 3 provides a discussion on how planning centers around deliberate and crisis action planning (CAP). Other planning considerations include spectrum-use conditions, and spectrum-use planning and procedures.

5. Predeployment, Deployment, and Buildup. Chapter 4 discusses those aspects of spectrum use and management that apply to deployment and buildup of the JTF include loading, transport, and assembly of forces in the JTF AOR. Responsibilities include finalizing initial electromagnetic spectrum requirements, assessing the electromagnetic environment, anticipating requirements for spectrum resources, and identifying, reporting, and resolving unacceptable EMI. Tools, techniques, and procedures used during deployment and buildup are also addressed.

6. Employment. Chapter 5 describes spectrum coordination and control during employment of the JTF. It specifically addresses the responsibilities of the JFMO and JCEWS and the tools, techniques, and procedures used during the employment phase.

7. Redeployment. Special spectrum management considerations associated with redeployment of the JTF are discussed in Chapter 6. Discussion includes redeployment for disbandment and redeployment for further operations. This chapter also addresses the tools, techniques, and procedures available to the JFMO during this phase.

8. Conclusion. This publication discusses the impact of the joint force commander's (JFC) decision on the employment of spectrum management assets to support joint operations. It covers the fundamental structural elements of spectrum management. It discusses the guidelines, basic tenets, and process for spectrum managers to use in planning for the support of joint operations. It covers JTF spectrum planning and operational considerations as they relate to the phases of a JTF operation. Finally, this publication describes major related spectrum management systems and organizations.

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SECTION III

1. Introduction. Joint doctrine states the JFC authorizes and controls use of the spectrum resource by military forces under his command. The JTF, which may consist of assigned or attached elements of the Army, Navy, Marine Corps, Coast Guard, and Air Force, is constituted and so designated by the Secretary of Defense, by a commander in chief (CINC), or by the commander of a subordinate unified command or existing JTFs.

2. Information Flow. A continuous flow of information is required for C2 of military forces across global distances and expanded AO. Timely, accurate, and relevant information flow in the highly mobile military operating environment is absolutely essential to controlling and exploiting use of the EMB throughout the range of military operations.

3. Spectrum Management. The complexity and vast distances involved in joint warfighting make control and management of the electromagnetic spectrum a crucial factor in the JFC's ability to influence decisive action.

a. The horizontal and vertical flow of information between adjacent and subordinate commands is equally critical during mission execution and demands continuous and uninterrupted access to the electromagnetic spectrum to support highly mobile, fast-moving operations. The JFC ensures that this information flow exists through the comprehensive management of the electromagnetic spectrum.

b. Management of the EMB is fundamental to the art of warfare. Spectrum and its use is the foundation for electrical, electronic, and electromagnetic communications. Frequency resources are governed by international law as national resources. Frequency assets must be coordinated and deconflicted on a continuous basis at strategic, operational, and tactical levels via a variety of national and international technical and political channels.

c. During crisis or wartime operations, the JFC employs C2W (a subset of IO) to control and dominate the EMB while denying this capability to the enemy. Close and continuous coordination between frequency managers and C2W and command, control, communications, and computers (C4) system planners is crucial to ensure continuous and uninterrupted access to the electromagnetic spectrum.

4. Spectrum-Use Conflicts. To ensure critical frequencies and C2 nodes are protected from unintentional interference due to friendly jamming operations, the J-6 coordinates, publishes, and distributes a Joint Restricted Frequency List (JRFL) based on inputs from the J-2, J-3, and J-6. The J-3 must approve the coordinated JRFL prior to its release. This is normally accomplished as part of the JCEWS function, the C2W Cell, or IO Cell. As new requirements are identified, situations of conflicting or competing use of the spectrum will occur. Conflicts within a primary functional area are resolved at the lowest possible level or by the JFMO. For conflicting or competing use that effects more than one primary functional area, the JCEWS examines requirements and attempts to resolve the problem in coordination with the JFMO/JSME. If resolution is not possible at this level, the matter is elevated to the JFC or designee, usually the J-3.

5. Planning

e. The fundamental concept of spectrum management operations is that efficient, effective spectrum use is achieved by thorough planning, coordination, and control. The central objective of spectrum management activities is to ensure effective use of the spectrum by friendly forces while supporting actions that deny spectrum use by adversary forces.

f. To use the spectrum successfully, all users must work together by exchanging spectrum-use information from the beginning of the point planning process through the execution of any operation. Automated spectrum management systems at the joint and component levels should be vertically and horizontally interoperable.

g. This manual addresses spectrum-use aspects in both the deliberate planning and the CAP processes, the need and purpose for establishing a joint task force spectrum management element (JSME), and the functions it performs in the planning, deployment and buildup, employment, and redeployment phases of JTF operations. Included are:

1) The composition and tasks of the JCEWS in the context of the close relationship the JFMO must maintain with the members of the JCEWS (the representatives of the JTF J-2, J-3, J-6 staffs and the component commands).

2) The responsibilities of the JSME.

3) Spectrum-use problems that may be encountered in each phase of JTF operations.

4) Specific guidance, techniques, and procedures are presented for:

a) Effecting spectrum-use authorizations (frequency assignments and allotments).

b) Developing the JTF spectrum-use plan.

c) Reporting and resolving unacceptable electromagnetic interference (EMI).

d) UN, allied, coalition, and host-nation spectrum-use and management considerations.

e) JTF spectrum use and management under peacetime considerations.

h. This publication also describes the joint automated spectrum-management tools available to the JTF spectrum managers.

i. This publication will assist the establishing authority, the commander of the joint task force (CJTF) and his staff, the JSME, and JTF component commanders and their staffs to effectively and efficiently control and use the electromagnetic battlespace in JTF operations.

CHAPTER 1

COMMAND RELATIONSHIPS IN A JOINT TASK FORCE

1. Introduction. Command is central to all military action, and unity of command is central to unity of effort. Unity of command is the interlocking web of responsibility, which is a foundation for trust, coordination, and the teamwork necessary for unified military action. Outlined in Figure 1-1 below are brief descriptions of duties and responsibilities, broken down by command echelon, to give the spectrum manager an overview of this unity of effort.

2. National Command Authorities (NCA). The NCA exercises authority and control of the armed forces through a single chain of command with two distinct branches. The first runs from the President to the Secretary of Defense, and then directly to the commanders of combatant commands for missions and forces assigned to their commands. The second branch is the Military Departments. Each is organized separately and operates under the authority, direction, and control of the Secretary of Defense.

3. Combatant Commands. The President establishes combatant (unified or specified) commands (COCOM) for the performance of military missions and prescribes the force structure of such commands. The commanders of combatant commands are responsible to the NCA to execute assigned missions and to accomplish the missions assigned to them.

a. Unified Combatant Commands. The unified combatant commanders (commonly referred to as CINCs) are responsible for the development and production of contingency plans. During peacetime, they act to deter war and prepare for war by planning for the transition to war and military operations other than war (MOOTW). During war, they plan and conduct campaigns and major operations to accomplish assigned missions. They will conduct this by maintaining preparedness of the command, and direct coordination with the subordinate commands to ensure unity of effort in all assigned missions, tasks, and responsibilities.

b. Combatant Specified Commands. A combatant specified commander has the same authority and responsibilities as the commander of a unified command except that no authority exists to establish subordinate commands.

4. Military Departments. The Secretaries of Military Departments are responsible for the administration and support of the forces assigned or attached to combatant commands. Each of the Military Departments and Services coordinates with the other departments, Services, and combatant commands, and have the responsibility for organizing, training, equipping, and providing forces to fulfill certain specific roles, and for administering and supporting these forces.

5. Joint Task Force (JTF). The Secretary of Defense, the combatant commander, subordinate unified commanders, or an existing JTF commander can establish a JTF. A JTF is established when the mission has a specific limited objective and does not require overall centralized control of logistics. The mission assigned a JTF should require execution of responsibilities involving two or more Services on a significant scale and close integration of effort, or should require coordination within a subordinate area or coordination of local defense of a subordinate area. A JTF is dissolved when the purpose for which it was created has been achieved. A sample JTF headquarters (HQ) structure is shown in Figure 1-2.

a. Joint Force Commander (JFC). The JFC will provide the superior commander with recommendations on the proper employment of assigned forces and for accomplishing operational missions assigned by the establishing commander.

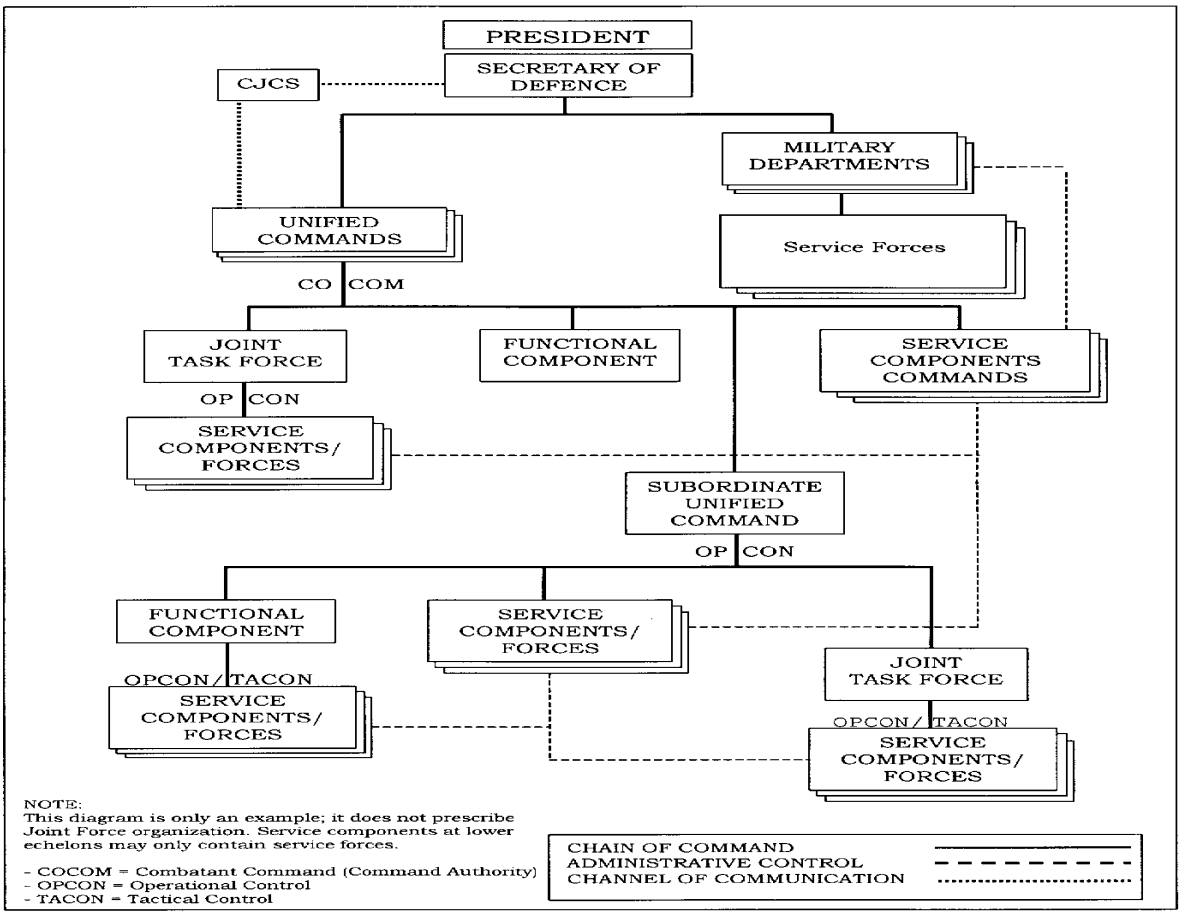

Figure 1-1. Chain of Command

JFCs are also responsible to the CINC for the conduct of joint training of assigned forces.

b. Joint Task Force Staff. The JFC may organize his joint staff as necessary to carry out his duties and responsibilities. When mission requirements exceed the staff's capabilities (for example, qualified personnel, facilities, and equipment), assistance must be requested through the superior commander. If the JFC is a Service component commander, he also draws from the resources of his component.

The authority establishing the JTF should make provisions to furnish the necessary personnel, facilities, and equipment. Composition, location, and facilities of the JTF HQ have a major influence on what the CJTF and staff can accomplish (for example, an afloat JTF HQ may have limitations aboard certain flag ships that could affect manning levels and equipment capabilities).

1) Manpower and Personnel Division (J-1). J-1 is charged with manpower management, formulation of personnel policies, and administration of personnel of the command.

2) Intelligence Division (J-2). The primary mission of the Intelligence Division is to ensure availability of reliable intelligence and timely warnings on the characteristics of the AO. The J-2 also ensures adequate intelligence collection and reporting to disclose enemy capabilities and intentions.

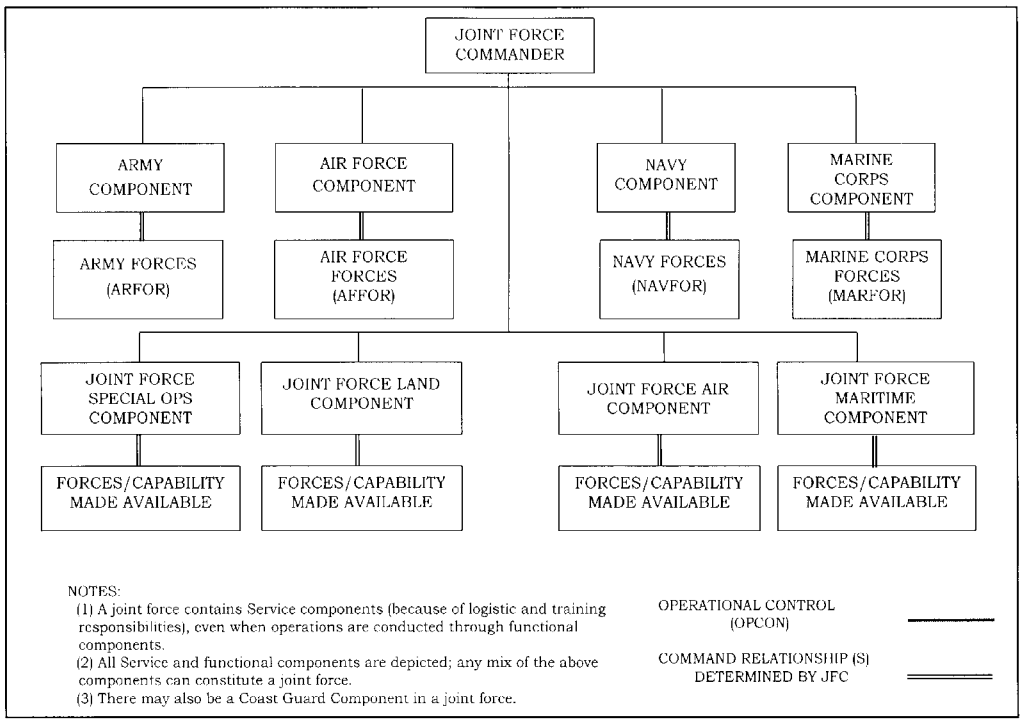

Figure 1-2. Sample Joint Task Force (JTF).

3) Operations Division (J-3). The Operations Division assists the commander in the discharge of assigned responsibility for the direction and control of operations. In this capacity this division plans, coordinates, and integrates operations to accomplish the assigned mission.

4) Joint Commanders Electronic Warfare Staff. The JCEWS assists the JFC in coordinating electronic warfare (EW) operations. The JCEWS consists of, but is not limited to, representatives from the JTF J-2, J-3 and J-6 staffs and component commands. Members of various supporting agencies [e.g., the Joint Command and Control Warfare Center (JC2WC), Joint Spectrum Center (JSC)] may augment the JCEWS.

5) Logistics Division (J-4). The Logistics Division is charged with the formulation of logistics plans and the coordination and supervision of supply, maintenance, repair, evacuation, transportation, engineering, salvage, procurement, health services, mortuary affairs, communications system support, security assistance, host-nation support, and related logistics activities.

6) Plans and Policy Division (J-5). The Plans and Policy Division assists the commander in long-range or future planning, preparation of campaign and outline plans, and associated estimates of the situation. It also establishes coordination channels with any host nation, neutral nations, or United Nations (UN) force involved in the JTF operation.

7) Command Control, Communications, and Computer

(C4) Systems Division (J-6). This division assists the commander in communications, electronics, and automated information systems. This includes development and integration of C4 architectures and plans supporting the command's operational and strategic requirements. J-6 also provides policy and guidance for implementation and integration of interoperable C4 systems to implement command and control.

a) Joint Command and Control Communications Center (JCCC). The J-6 establishes a JCCC to manage all communications systems deployed during joint operations and exercises. The JCCC, as an element of the J-6, exercises control over all deployed communications systems. The JCCC serves as single control agency for the management and operational direction of the joint communications network (ref q).

b) Joint Task Force Spectrum Management Element (JSME). The JSME's primary function is to ensure assigned JTF military forces are authorized sufficient use of the spectrum to execute their designated missions. It will satisfy spectrum needs and ensure deconfliction, prior to assignment or allotment, of all spectrum-dependent systems including systems used by JTF and component forces, UN, NATO, coalitions, etc.

(1) Although control of individually assigned frequencies is in reality exercised by each user, the supported JFC is the ultimate authority for assigning frequencies to users. The JFC normally delegates frequency assignment authority to the JSME. The JSME can further delegate frequency assignment authority to subordinate commands. The JSME also maintains a common source of spectrum-use information to ensure compatible frequency assignments and, in concert with the JCEWS planners, publishes the JRFL, after approval by the J-3.

(2) The JSME may be assigned from the supported component's J-6 staff, from a Service component's staff, or from an external command. The JSME must be staffed with trained spectrum managers, preferably with experience in joint operations and knowledge of the spectrum requirements of the JTF component forces.

6. Functional Component Commands. The JFC may elect to establish functional component commands to control military operations (i.e., Joint Forces Land Component Commander-JFLCC, Joint Force Air Component Commander-JFACC, and the Joint Force Maritime Component Commander-JFMCC). The JFC will designate the military capability to be made available for tasking by the functional component commander. These commands may be established for operational purposes across the range of military operations.

7. Service Component Commands. These commanders have responsibilities derived from their roles in fulfilling the Services' support function, and when designated by the JFC, may also be in the operational chain of command. They are also responsible for accomplishing operational missions, conducting joint operations, keeping the JFC informed of all decisions that may affect the overall joint mission, and are responsible for all internal administration, discipline, training, and Service intelligence matters.

CHAPTER 2

SPECTRUM MANAGEMENT RELATIONSHIPS IN A JOINT TASK FORCE

1. Introduction. Total control of the EMB is a key to successful military operations. The ultimate goal of spectrum use planning and management is to control the electromagnetic spectrum so that it serves the needs of US, UN, allied, and/or coalition forces. Another goal is to deny the enemy the use of the electromagnetic spectrum so that he is unable to command, control, or otherwise employ his forces effectively.

2. Duties and Responsibilities. Outlined below are the duties and responsibilities, IAW CJCSI 3220.01, broken down by command echelon, as they apply to spectrum management of the EMB.

3. Unified Commander In Chief (CINC). It is the responsibility of the unified CINC to establish and promulgate command-specific policy and guidance for electromagnetic spectrum-use, JRFL process, JCEOI, and other processes or directives that uniquely apply to their area. Other duties are to:

a. Establish a standing frequency management structure that includes a JFMO, and procedures to support planned and ongoing operations. Specific actions will be taken to:

b. Ensure operational, contingency, and communications plans address coordination among forces using spectrum to enable effective exchange of information, eliminate duplication of effort, and achieve mutual support.

c. Ensure plans address any necessary augmentation of the JFMO/JSME to support the effort.

d. Resolve user conflicts not resolved at a lower level.

e. Maintain close contact with appropriate foreign military forces to ensure that mutual spectrum support is considered in combined planning, operations, training, and exercises.

f. Function as controlling authority for JCEOI.

4. Joint Frequency Management Office. The responsibilities of the JFMO are to:

a. Develop and distribute spectrum-use plans for particular frequency bands, as appropriate.

b. Participate in the JCEWS, C2W Cell, and/or IO Cell. Prepare and combine J-2, J-3, J-6, and component inputs to develop a proposed JRFL for approval by the J-3.

c. Periodically update and distribute the JRFL.

d. Provide administrative and technical support for military spectrum-use.

e. Exercise or delegate frequency assignment authority.

f. Maintain the common data base necessary for planning and coordinating control of the EMB. This data base contains spectrum-use information on all friendly military and civilian, available enemy, and neutral spectrum use unique to the AOR and area of influence (AOI) involved.

g. Analyze and evaluate potential spectrum-use conflicts.

h. Assist and coordinate the resolution of spectrum-use conflicts as a member of the JCEWS, C2W cell, and/or IO Cell.

i. In coordination with J-5 guidance, coordinate military spectrum-use with the spectrum authority of the host nation(s) involved.

j. Serves as the focal point for inclusion of spectrum-use requirements in the Joint Operation Planning & Execution System (JOPES).

k. Receive interference reports IAW reference c and attempt to resolve incidents of unacceptable electromagnetic interference (EMI). Report all EMI incidents to the JSC. Act as the focal point for requesting Joint Spectrum Interference Resolution (JSIR) support from the JSC.

l. Support the operation as a member of the JCEWS.

5. Joint Force Commander. Duties are to:

a. For operations within a CINC AOR, follow electromagnetic spectrum use policy and guidance established by the CINC.

b. Work with the CINC staff if modifications to the spectrum-use policy are necessary for specific situation(s).

c. For operations outside a CINC AOR, assume the responsibilities listed for the CINC.

d. Coordinate with supporting CINCs to determine what functions their staffs must undertake to control use of the electromagnetic spectrum and what outside support is available.

6. Joint Force Commander's Staff.

a. Joint Task Force J-1. Coordinate all personnel augmentation for the JSME and ensure these augmentees are added to the Time-Phased Force and Deployment Data (TPFDD).

b. Joint Task Force J-2.

1) Participate (through the JCEWS) in multifunctional user spectrum-use conflict resolution.

2) Assess intelligence needs and provide the J-6 with prioritized spectrum-use requirements for intelligence operations.

3) Participate in multifunctional user, spectrum-use conflict resolution.

4) Provide JRFL input.

5) Provide the JSME with available enemy spectrum-use data IAW releasability constraints through the Director, National Security Agency (NSA), who serves as the Signal Intelligence (SIGINT) authority.

6) Include spectrum-use requirements in the JOPES.

7) Assist the J-6 and/or JSME in determining sources of any unacceptable EMI or other persistent and recurring interference.

c. Joint Task Force J-3. Duties are to:

1) Prioritize all spectrum use conflicts that occur to the JSME.

2) Provide spectrum-use requirements to J-6 for inclusion in the JOPES.

3) Resolve internal spectrum-use conflicts (J-3 systems) which the JSME or JCEWS, C2W Cell, and/or IO Cell are unable to.

4) Provide concept of operation.

5) Identify and resolve potential electromagnetic environmental effects (E3) hazards to ordnance, personnel, and fuel. Act as focal point for requesting ordnance assistance team support from the JSC.

d. JCEWS. Duties are to:

1) Provide the JFC with the capability to integrate, coordinate, and deconflict the full spectrum of EW.
2) Assist the JSME in developing, compiling, and distributing the JRFL.

3) Assist the component commanders in assessing instances of hostile EW and assist the JSME in assessing situations requiring EW deconfliction.

e. Joint Task Force J-4. Provide the JSME with any required spectrum use considerations at ports of embarkation/debarkation, or waypoints during the deployment or redeployment phases.

f. Joint Task Force J-5. Duties are to:

1) Incorporate spectrum use into long-range and future operations planning and C2W strategy, based upon input from the J-2, J-3, JCEWS, and J-6 (JSME).

2) Establish coordination channels with any host nation, neutral nation, or UN force involved in a joint or coalition military operation to negotiate military spectrum use where procedures do not already exist.

g. Joint Task Force J-6. Duties are to:

1) Provide the required JTF nets that will be used for JCEOI input to the JSME.

2) Assist the electronic warfare officer (EWO) in integrating EW activity into operations to ensure minimum impact on friendly use of the EMB.

3) Update the JRFL as required.

4) Serve as the JCEWS communications representative. Be the primary source for information on the impact of EW actions on friendly C2 nodes and the overall impact of joint EW actions on friendly force operations.

5) Coordinate with the JSME for component command resolution of reported instances of interference or disruption.

h. Joint Command & Control Communications Staff. Duties are to:

1) Manage all communications systems deployed during joint operations and exercises.

2) Exercise control over all deployed communications systems.

3) Serve as single control agency for management and operational direction of the joint communications network. (Figure 2-1 has typical JCCC organization)

i. Joint Task Force Spectrum Management Element. Duties are to:

1) Establish, JTF specific guidance for managing, requesting, coordinating, and assigning electromagnetic spectrum-use, JRFL process, JCEOI, and other processes.

2) Prepare and combine J-2, J-3, J-6 and component inputs to develop a JTF JRFL for approval by the J-3.

3) When required, periodically update and distribute the JRFL.

4) Participate in the JCEWS cell representing spectrum management issues.

5) Exercise frequency allotment and assignment authority. Authority may be delegated to issue frequency assignments or allotments to provide components the maximum latitude and flexibility in support of combat operations.

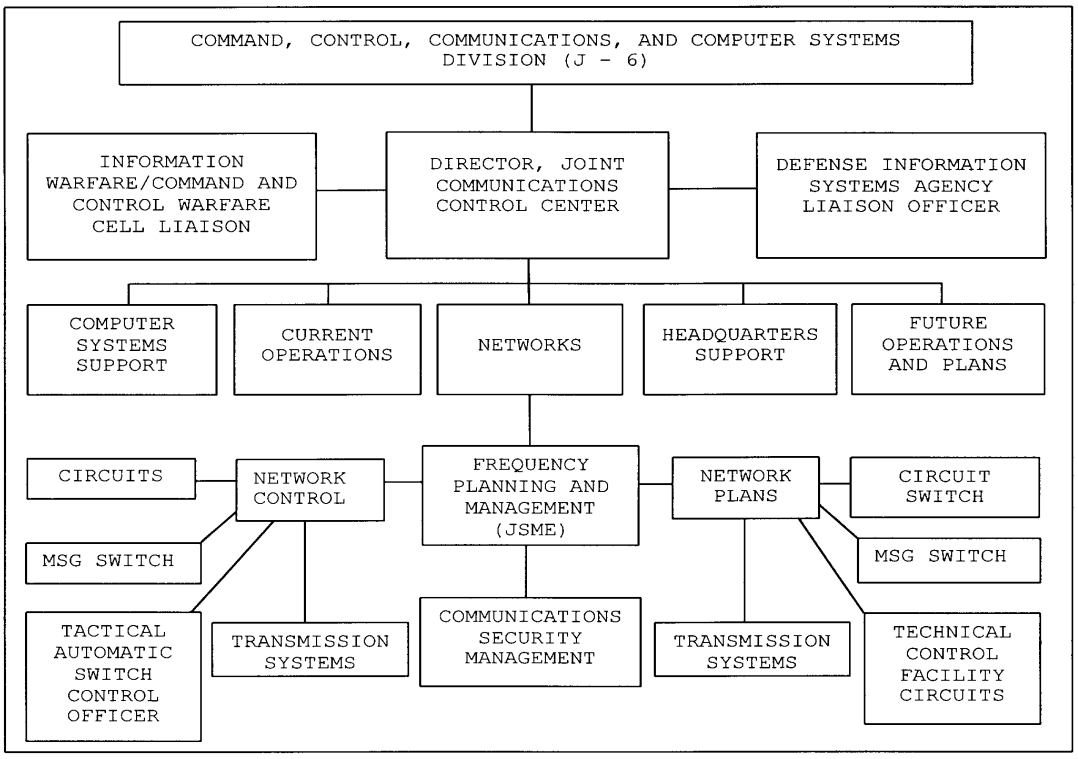

Figure 2-1. Joint Command and Control Communications Center (JCCC).

6) Maintain the common spectrum-use data base necessary for planning and coordinating control of the EMB. This data base contains spectrum use information on all friendly military and civilian, available enemy, and neutral forces.

7) Analyze and evaluate potential spectrum use conflicts.

8) Assist and coordinate the resolution of spectrum use conflicts as a member of the JCEWS, C2W Cell, and/or IO Cell.

9) In accordance with J-5 guidance coordinate military spectrum use with the spectrum authority of the host nation(s) or coalition forces involved.

10) Receive interference reports IAW CJCSI 3220.02, analyze and attempt to resolve incidents of unacceptable EMI.

11) Develop and distribute spectrum-use plans (see Appendix D, Annex C) that include frequency reuse and sharing schemes for specific frequency bands, as appropriate.

7. Functional Component Commanders. The duties of the Functional Component Commanders are to:

a. Provide component JCEOI input to include all callword requirements to the JCCC.

b. Consolidate and validate component spectrum-use requirements to the JSME.

c. Provide component JRFL input to the JCEWS.

8. Service Component Commanders. The duties of the Service Component Commanders are to:

a Consolidate and validate component spectrum-use requirements to the JSME.

b. Provide component JRFL input to the JCEWS.

9. Spectrum Users. Duties are to:

a. Obtain frequency authorization for each use of the electromagnetic spectrum by their appropriate joint force component.

b. Use frequencies as assigned and operate systems IAW parameters authorized by the frequency assignment process.

c. Coordinate any need to exceed or operate spectrum-dependent equipment outside the parameters authorized by the appropriate spectrum-use plan.

d. Ensure the spectrum-dependent equipment is properly maintained to preclude unintentional violation of authorized spectrum-use parameters.

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CHAPTER 3

PLANNING

1. Introduction. The major decisions made during the planning phase, such as the AOR, concept of operations, force structure, and deployment schedule of force elements, are key factors that influence the determination of spectrum-use requirements. Therefore, the JFC should establish the JSME early in crisis action planning (CAP) Phase III. Otherwise, the JSME's ability to identify and anticipate spectrum-use requirements can be seriously impaired. Additionally, critical spectrum-use management and oversight during the deployment and employment phases are diluted by the reactive, rather than proactive, meeting of spectrum-use requirements that occur in the planning phase. In effect, most of the actions required of the JSME in the planning phase are carried over into the deployment and/or employment phases if they are not accomplished at the appropriate time.

2. Types of Planning. The two types of planning are deliberate planning and crisis action planning.

a. Deliberate Planning. Deliberate planning is conducted to prepare for contingent situations that could occur in a CINC's AOR and is based on a likely scenario rather than a specific crisis event. Deliberate planning includes developing and specifying the probable force structure, which may be a JTF, necessary to respond to the contemplated situation, but an actual force is not formed unless and until the contingency plan is executed.

In most cases, the CINC's staff conducts deliberate planning. In this likely event, the JTF staff starts with the CINC contingency plan for the operation and must update and refine this plan to fit the situation as it has actually evolved. See Appendix D for JFMO/JSME planning considerations.

b. Crisis Action Planning. The supported commander's staff usually initiates CAP. A JTF is optimally established before or during CAP Phase III Course of Action Development (COA) to allow the designated JTF commander and his staff to participate in the remainder of the CAP process. The JFC's staff must maintain a close relationship with the supported commander's staff during Phases III COA and IV COA selection to ensure that planning activities are coordinated. To preclude interruptions in the planning process, the supported commander's staff must ensure that all materials, such as operations plans (OPLANs) and contingency plans, pertinent to planning, are organized and available.

Once the JTF is formed, the JFC and his staff participate in CAP activities. During CAP Phase V, the supported commander's crisis action staff publishes the supported commander's operation order (OPORD). The JFC and his staff conduct parallel, but more detailed, execution planning and normally issue a supporting CJTF OPORD with detailed instructions to subordinates (see reference j).

3. Joint Spectrum Management Organizations. The JFMO is a standing day-to-day CINC organization that requests, coordinates, and assigns spectrum resources within the CINC AOR (see Chapter 2 for detailed guidance on JFMO duties). The JSME is created in support of a JTF. The JSME's primary function is operational spectrum management in the JTF AOR. Deliberate planning and CAP can be performed by either the JFMO or JSME. Normally, the JFMO performs all deliberate planning and the initial phases of CAP. The JSME is created, normally by CAP Phase III, and assumes the duties of spectrum management for the specific AOR, when fully operational.

4. Spectrum Management Considerations. To prepare for crisis, contingency, or wartime operations, realistic spectrum-use conditions must be included as the primary objective of both field training exercises (FTX) and command post exercises (CPX). This is

necessary to ensure that key players understand the processes of planning, coordinating, and controlling use of the electromagnetic spectrum in military operations. Where actual means of spectrum employment are limited in a peacetime exercise, such as restrictions on jamming, realistic simulations should be used. For peacetime exercises, planners should review Joint Universal Lessons Learned (JULL) to help determine realistic simulations to exercise spectrum employment.

5. Joint Task Force. The JTF spectrum management concept must comply with the JTF principle of centralized direction and decentralized execution. The JFMO/JSME must identify CINC/JTF HQ frequency requirements, solicit frequency requirements from component commands early, obtain the necessary frequency assets, and authorize their use by subordinate and component commands through assignments and allotments. When practical, the authority to make specific, detailed assignments to specific users should be decentralized to subordinate and component commands. In this regard, the JFMO/JSME establishes spectrum policy, provides guidance, and acts, in a sense, as a frequency broker by obtaining the commodity in bulk quantities and apportioning it in accordance with market demand. Only through decentralizing the frequency assignment process is the JFMO/JSME able to provide oversight to the JTF's spectrum-use management functions (EW, intelligence, interference resolution, host-nation coordination, etc.).

6. Situation Assessment. An initial gathering of information is made to support spectrum-planning decision making. Sources of this information may include the intelligence community, the JTF warning order, pertinent contingency plans, and previous concepts of operations. This effort may include updating previously produced orders and plans with current data.

7. Spectrum Management Concept Development. This concept merges spectrum management assumptions with current known force capabilities and information updates to support decision making as situation changes and hostile actions dictate. Since assumptions and force capabilities are different for each JTF operation, and are likely to change during an operation, the concept for managing the spectrum must be tailored to the peculiar requirements of each specific JTF operation.

8. Spectrum-Use Requirements Determination. Multiple requirements for spectrum resources are identified, merged, and prioritized according to command doctrine and guidance into a single, refined statement of spectrum-use requirements.

a. Command and Control (C2). The spectrum is used for C2 of friendly forces. C2 is embedded in and critical to the operation of some weapon systems, such as precision-guided munitions that rely on a controlling data link, unmanned aerial vehicles, and fire control radar. Communications uses of the spectrum include voice and data. Examples of these uses include C2 links between an operations center and maneuver forces, relay of intelligence and logistics data over satellite links, and coordination between air and ground forces using voice or data links.

b. Information Operations (IO). The J-3 actively employs equipment that operates in the electromagnetic spectrum for the EW, military deception, psychological operations (PSYOP), and elements of IO. EW may include passive reception of enemy emissions for tactical uses. See reference n for details.

c. Intelligence. The J-2 uses the spectrum both passively and actively: Passively by monitoring the adversary's use of the spectrum, and actively by using systems such as synthetic aperture radar to learn enemy location, disposition, and intent, and to receive and transmit intelligence and intelligence products.

9. Spectrum Management Plan Development. The JFMO/JSME provides spectrum management guidance and support for accomplishing each of the planning tasks outlined in Appendix D. Deliberate planning for use of the spectrum resource and the assignment of spectrum management responsibilities must be fully integrated and synchronized with events described in the JOPES.

a. The complexity of effective joint spectrum use and management requires advance planning for the scenarios expected in military operations. Each joint and subordinate component command must establish planning procedures that address all spectrum-dependent equipment used in support of an OPLAN/OPORD.

b. Spectrum managers at the JFMO, JSME, and component forces must be fully integrated into the planning process at the earliest stages. Additionally, planning must be done in a manner consistent with that of each joint command expected to be supported. Without advance spectrum management planning, mutual EMI among users and an unnecessary shortage of assignable spectrum may become a severe limitation to rapid deployment and employment of forces.

10. Joint Spectrum Use-Plan. The key role of the JFMO/JSME is to develop a spectrum-use and spectrum management plan that addresses coordination and control of spectrum use throughout the JTF. Without this central direction, the JTF HQ and component forces could not hope to achieve optimum use of available spectrum resources and therefore be unable to satisfactorily support the JTF COA.

a. The spectrum-use and spectrum management plan must be detailed enough to satisfy all known and anticipated requirements, must be clear and concise so that all spectrum users can understand and comply with their direction, and must be in full compliance with the course of action. Appendix D, Annex C provides instructions on developing the spectrum-use plan. The spectrum-use and spectrum management plans are normally published as an appendix to the Communications Annex (Annex K) of the OPLAN or CONPLAN (OPLAN in conceptual format), which are products of the deliberate planning process.

b. The JFC may establish a JSME at any time. The later in the planning process the JSME is established, the more critical and time-compressed the effort is to collect and organize the necessary information affecting spectrum use and management. Regardless of when the JSME is created, the JFC, JTF staff, and JFMO have, in most cases, already started the CAP process and JOPES is likely to be in use. The JSME must be aware that the JFC and JTF staff make many key decisions that generate spectrum management requirements and impact spectrum-use planning.

11. Identification of Electromagnetic Spectrum-Use Requirements. One of the primary missions of a unified command is to prepare for warfighting and other contingency actions. Therefore, planners must determine the resource requirements of component forces engaged in executing the plans of the CINCs in advance. The requirements of the JTF HQ must be added. If plans are to be successfully executed, they must provide for critical resources, electromagnetic spectrum.

a. The JFMO/JSME must therefore charge assigned components to identify spectrum requirements in order to carry out their assigned missions. The JFMO/JSME must also obtain the requirements of the spectrum users, primarily the J-2, J-3, and J-6 within the JTF HQ. These requirements must address both communications and noncommunications (radar, weapons, etc.) systems and be stated in terms of spectrum requirements to support the force structures involved in the various contemplated contingencies.

b. The JFMO/JSME must also be aware of numerous noncomponent frequency requirements that may surface prior to or during the conduct of operations. These may stem from many sources (diplomatic, media, morale and welfare organizations) and may require a variety of frequencies to satisfy (broadcast bands, high frequency (HF) amateur frequencies, commercial satellite, civil land-mobile, etc).

c. This building-block approach to identifying requirements not only facilitates obtaining and allocating spectrum resources for known requirements but also provides invaluable knowledge of the spectrum

requirements of typical modules that may be called out to form a JTF or other such force in response to a short-notice crisis.

d. Failure to identify spectrum requirements in advance and to process them in modular fashion results in the JSME having to accomplish this fundamental action in a compressed time period, along with a many other last-minute details requiring its attention.

e. Users must approach the spectrum management process in a manner consistent with the CINC's policy for spectrum management. The J-6 usually develops the commander's policy, which includes documents such as the CINC's OPLAN and JCEOI.

f. At each level, users must identify and submit spectrum requirements and to the JFMO or JSME as appropriate. Users are also responsible for detecting and reporting potential conflicts in frequency authorizations granted them so that possible interference situations may be precluded.

g. Users must obtain satellite access authority and the appropriate frequency assignments prior to actual activation of any satellite circuits. The J-6 Networks Branch of the supported CINC normally consolidates and submits requests for military ultra-high frequency (UHF) and super-high frequency (SHF) satellite access on behalf of the CINC. The operations and communications staff members should be clearly informed as to which JTF action office is responsible for these tasks.

12. Assessment of Electromagnetic Battlespace. Overall success of JTF spectrum management planning depends on prior knowledge of the proposed EMB.

a. The EMB includes: background environmental information (BEI); the hostile (red), friendly (blue), UN, host nation, and coalition (gray) forces electromagnetic order of battle (EOB), within the JFC's AOR and AOI, see figure 3-1. The BEI is the combination of the civil electromagnetic infrastructure and natural phenomena. The AOI is the electromagnetic environment that surrounds the AOR where a potential for electromagnetic interaction exists.

b. The J-2 is tasked with providing information on spectrum use by hostile forces. Also, the J-5 is tasked with establishing liaison with host nations and UN forces. Any such liaison arranged by the J-5 must provide for establishing appropriate channels and working contacts for the JFMO or JSME with host nation or UN telecommunications and/or spectrum management authorities. In addition, OPLANs and CONPLANs pertaining to the AOR may yield knowledge of the AOR's EME. The international frequency list (IFL) maintained by the Radio-communication Bureau of the International Telecommunications Union (ITU), as well as Area Studies, may also be helpful (see Table E-1 of Appendix E for a list of ITU restricted frequencies).

c. The JFMO/JSME must consider any US or friendly force spectrum use occurring in the AOR in support of air, naval, reconnaissance, or special operations forces (SOF), etc. activities. A recommended practice that aids the JFMO/JSME in assessing the AOR EME during the planning and employment phases of actual operations is collecting, organizing, validating, and storing information pertaining to the EMB. This data base constitutes the common source of spectrum-use information for the JTF during its existence and may serve as a planning aid for future operations.

13. Authorization of Friendly Force Spectrum. Although control of individually assigned frequencies is in reality exercised by each user, the supported JFC is the ultimate authority for assigning frequencies to users. The JFC normally delegates frequency assignment authority to the JSME. The JSME can, and usually does, further delegate frequency assignment authority to subordinate commands. The JSME maintains a common source of spectrum-use information to ensure compatible frequency assignments and, in concert with the JCEWS, publishes the approved JRFL.

a. Although this common source of information is necessary for maintaining overall control of spectrum use, exercising centralized control without delegating frequency assignment authority should not be practiced. Authority to assign the use of specific spectrum assets should be delegated to the lowest possible level of command consistent with:

1) Sound spectrum management.

2) The course of action.

3) Priority of mission functions.

b. After obtaining the total spectrum-use requirements of the component forces and JTF HQ, and assessing the EMB, the JFMO/JSME must obtain the spectrum resources necessary to support planned operations.

c. Procedures for authorizing use of spectrum are presented in Annex C to Appendix D. Fundamental to these procedures is the premise that users must be authorized sufficient spectrum, in the desired bands and with the technical parameters, required to accomplish their missions.

d. In some cases, such as for combat net radios, authorization consists of calling out a specific edition of the JCEOI and/or identifying blocks of frequencies for use in specified bands with specified operating limits (generally known as allotment plan). In other cases, authorizations are for discrete frequencies, bands, or engineered frequency pairs/complements.

e. The JFMO/JSME must specify methods for components to pass data updates on frequency authorizations to or from the common source of spectrum-use information. These methods ensure the information remains current in order to facilitate the origination and engineering of follow-on authorizations. These data updates must also be exchanged laterally as appropriate.

f. The JFMO/JSME will specify conditions under which coordination must occur and the coordinating authorities to be involved.

14. Resolution of Electromagnetic Interference. Unacceptable EMI, that adversely affects mission accomplishment, may be caused by friendly, enemy, neutral, or natural sources. Incidents of unacceptable EMI that cannot be resolved locally will be reported to the JFMO/JSME by the users affected IAW reference d. The JFMO/JSME assisted by the JCEWS attempts to identify and locate the source of interference and provide resolution.

a. The JTF spectrum management plan must provide for reporting and resolving unacceptable EMI. Appendix B provides procedures for reporting, classifying, and resolving EMI occurrences.

b. An additional concern is interference from JTF emitters to spectrum-dependent equipment in other countries within the JTF AOI. Affected countries

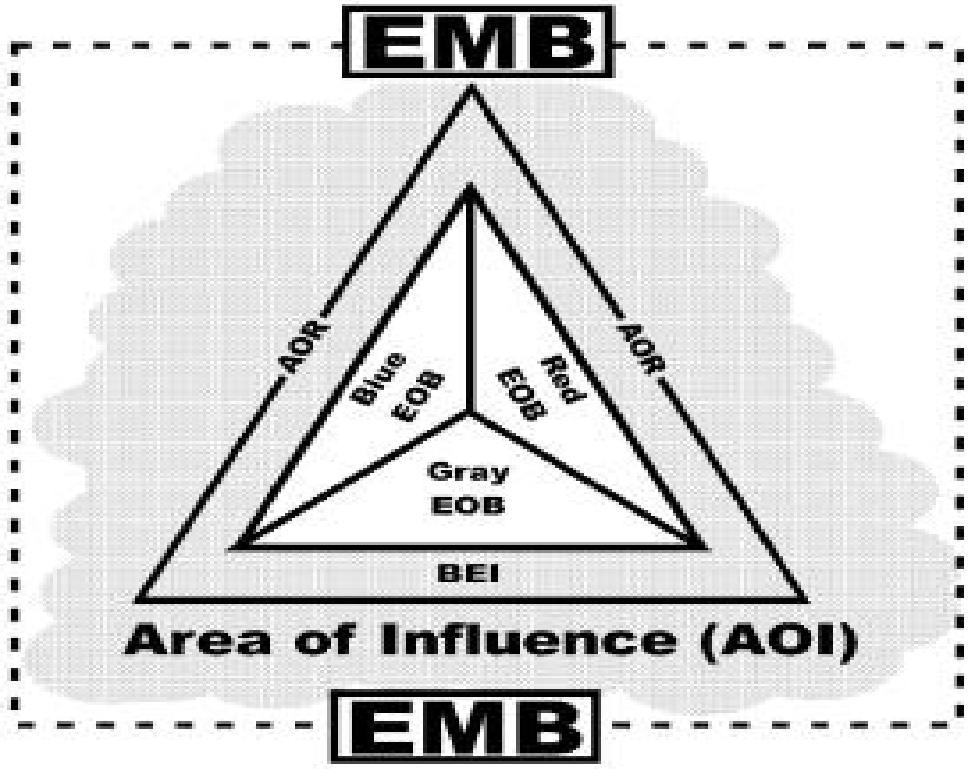

Figure 3-1. Electromagnetic Battlespace (EMB).

may cite protection under ITU Radio Regulations that may in turn require diplomatic resolution involving the Department of State.

15. EW Deconfliction. EW deconfliction is a process to optimize the use of the spectrum. This process is used to identify and prioritize a compatible, coordinated listing of PROTECTED, GUARDED, and TABOO frequencies based upon EW, SIGINT, C3, and operational requirements.

a. The JFMO/JSME involved in EW deconfliction process must consider the spectrum allocation decisions of the ITU and host-nation spectrum management regulations. To distinguish interference from hostile EW effects, the JCEWS must alert the JFMO/JSME to any changes in the state of friendly and enemy EW operations.

b. To assess the effects of EW on the EMB of the JTF, the JFMO must know the operating characteristics of the EW equipment employed in the JTF AOR.

c. The JCEWS is the primary EW deconfliction authority. The JFMO/JSME, however, plays an essential role in the deconfliction process. It maintains the database of spectrum-use information and spectrum management tools for performing EW deconfliction.

16. Spectrum Management Tools. The primary spectrum management tools available to the JFMO/JSME are spectrum-use information, spectrum engineering and management capabilities, and the communications with which spectrum-use authorizations and information may be exchanged and coordinated. A description of the designated automated tools currently available is contained in Appendix A.

17. Spectrum-Use Information. Joint spectrum management requires a common database of all spectrum dependent systems within the EMB.

a. The JFC, through the JSME, is responsible for building and managing this common database. Because of the amount and complexity of spectrum-use information inherent in joint military operations, use of modern computer and communications networking systems is essential to maintain, analyze, and distribute this common spectrum-use information.

b. Establishment of this data base should begin as early as possible in the planning phase.

c. The data base is initialized by extracting records applicable to the JTF AOR from the database maintained by the CINC.

d. The data base is then augmented with additional information on red force spectrum-use (as provided by the J-2), gray force spectrum-use (derived by research or liaison), and blue force spectrum-use (JTF).

e. The database is kept current as changes occur.

18. Spectrum Engineering and Management Capabilities. Tools such as those described in Appendix A provide the spectrum manager with many capabilities. Examples include:

a. Selection of candidate frequencies to meet specific requirements.

b. Modeling the probable performance of a transmitter at specified locations and under given circumstances.

c. Formatting the data necessary to nominate the selected frequencies for authorization.

d. Effecting and recording coordination action.

e. Authorizing and recording spectrum-use in the common spectrum-use data base.

f. Joint Spectrum Management System for Windows ($JSMS_w$) is a personal computer (PC) based system that supports the spectrum manager in peacetime and during contingency operations. $JSMS_w$ is intended to support JTF operational planning as well as manage the spectrum with emphasis on assigning frequencies, EW deconfliction, and JRFL development during operations.

19. Communications. The distribution and exchange of spectrum-use information throughout the JTF is essential if the principles of planning, coordination, and control are to be attained. The timely distribution of data presents the JFMO/JSME with a particularly difficult challenge. Successful communication of spectrum-use information depends on the existence of telecommunication paths, data networks using these paths, and common data exchange formats.

a. Telecommunications. To ensure communications paths are available, the JSME must plan for means of communications to the supported commanders, assigned and supporting forces, the host nation, and other organizations involved.

1) If critical spectrum-use message traffic is adversely affected by delays, the JSME must explore alternative telecommunications paths or means.

2) The JSME should ensure that accounts are established on a regional Frequency Records Resource System (FRRS) Distributed Computer Facility (DCF) to provide a means of transferring and coordinating spectrum-use information.

b. Common Data Exchange Formats. Common data exchange formats are essential if spectrum-use information for all participants is to be exchanged. Reference a specifies the standard

frequency action format (SFAF) as the common data exchange format for use between US forces and some allied nations. When the US Message Text Format (USMTF) is required to electronically transmit spectrum-use information, the formatted information can be included as free text in the Remarks portion of the message, with appropriate delimiters as prescribed by the Military Communications-Electronics Board (MCEB).

c. Other Formats. Other data exchange formats may be specified as required by the CINC, based on the location and circumstances of a given operation. Such may be the case in exchanging spectrum-use information with host nations (particularly lesser developed nations) or UN forces where narrative descriptions of a frequency transaction may be the only way to convey the information.

20. Techniques and Procedures. Generally, the spectrum management infrastructure follows established command relationships. The JFMO/JSME must ensure that all spectrum manage-ment organizations associated with the JTF, internally and externally, are aware of the spectrum management infrastructure, particularly if any variances from the established command relationship infrastructure exist.

The JFMO/JSME must anticipate the need to effect spectrum coordination with external UN, allied, coalition, or US forces. He must also anticipate the need to coordinate and obtain frequency assets from foreign governments (host nations and other foreign governments whose BEI may be adversely affected by JTF operations or forces transiting to and from the JTF AOR). If a need for such coordination is identified, the JSME must request this authority as early in the planning process as possible. Annex C of Appendix D provides an example of a spectrum-use plan.

21. Execution. The planning phase officially terminates when the OPORD is executed. The communications plan supporting the operation is normally published in Annex K of the OPLAN. Annex C to Appendix D provides an example of a JTF spectrum management plan.

CHAPTER 4

PREDEPLOYMENT, DEPLOYMENT, AND BUILDUP

1. General. The initial phases of a JTF operation consist of predeployment, deployment, and buildup. These phases involve planning, loading, transport, and assembly in the AOR of assigned forces. Transport may be by land, sea, or air or a combination thereof. Prior to the commencement of the deployment and buildup phases, the JSME should be functional. The JSME must know the embarkation, debarkation, and waypoints spectrum requirements of the JTF component forces to assign and allot the necessary spectrum. These authorizations are especially critical for forces that may have missions in an initial assault, if planned for the operation.

Effective control of the spectrum is extremely difficult when units rapidly change locations and communications lines are minimal. These difficulties may be further compounded by the need to deconflict the initial JTF spectrum-use plan with frequencies already in use in the AOR. Additionally, any changes in the COA, a result of recently updated intelligence reports, will require a commensurate adjustment of the spectrum-use plan. The level and tempo of buildup in the AOR presents the JSME with many challenges as it responds to the rapid gathering of forces, refines the assessment of the EMB, and makes required changes to the spectrum-use plan. In effect, planning tasks carry over into the deployment phase.

2. Predeployment. After the OPORD is executed the following steps must be accomplished:

a. The JFMO/JSME needs to ensure that communications are available to link all spectrum management elements.

b. An example of communications means that are available and often used are secure (STU-III) commercial and DSN phone lines, Secure Internet Protocol Router Network (SIPRNET), and facsimile, etc.

c. All spectrum managers must receive the initial spectrum management operational policy and procedures message, the spectrum management plan, JCEOI, and the updated JRFL. This information is critical to planning and execution, and must be disseminated prior to deployment.

d. Personnel identified in the Time Phased Force Deployment Data List (TPFDL) to augment the JSME need to be available, processed for deployment, and briefed on the mission.

e. Information must be safeguarded during all phases, especially during predeployment due to its criticality. Essential elements of friendly information (EEFI) must not pass to hostile forces or to those who do not have the “need to know.”

3. Deployment. In addition to the challenges of exchanging spectrum-use planning, coordination, and control information, the JFMO/JSME must respond to events that develop during the deployment phase that change spectrum-use requirements. Such events could provide new and different intelligence information regarding enemy spectrum use (J-2); non-JTF activities in the AOR; changes in force composition, tactics, and COA (J-3); or changes to the communications plan (J-6). Consequently, the JFMO/JSME may have to modify the spectrum-use plan of the applicable OPLAN/OPORD.

a. The JFMO/JSME must ensure that all modifications to the spectrum-use plan are coordinated and disseminated to component forces and other involved organizations. This task is extremely critical and difficult to accomplish due to the transient state of forces concerned. The JFMO/JSME must ensure this essential information reaches every intended participant in time to permit appropriate reaction.

b. The JFMO must transition operations to the JSME from the

planning location to the JTF HQ in the AOR and notify all JTF elements. This transition plan should be included in the spectrum management appendix to the OPLAN/OPORD, but if not included, the JFMO must determine and disseminate such during the deployment phase.

4. Buildup. Buildup of component forces in the JTF AOR commences when the initial forces arrive, whether by forced entry or in a permissive environment (as in the case of initial assembly in a host nation to prosecute a future plan of action). In either event, frequency authorizations must be in place so that component commanders can immediately begin exercising C2 over their forces, deploying weapons systems, and functioning in the AOR.

a. Upon arriving in the AOR and positioning the JSME, the leader must reassess the EMB based on actual, on-scene knowledge, and on information from component forces already established in the AOR. This reassessment could result in updated information on the EMB that the JSME must organize, analyze, evaluate, and when appropriate, enter into the spectrum-use data base. The JSME must convey information critical to component force employment. The supporting JFMO will continue to forward information important to the JSME.

b. Liaison with the host nation or UN force spectrum management authorities should be solidified as soon as possible following deployment and arrival of the JSME. The JSME should coordinate with the JTF J-5 prior to effecting any liaison. Verification of host nation spectrum-use, requests for additional spectrum requirements, and establishment of a solid working relationship are necessary.

5. Responsibilities. The responsibilities of the JFMO/JSME during predeployment, deployment, and buildup phases include finalizing electromagnetic spectrum-use requirements, reevaluating the EMB, anticipating requirements for spectrum resources, and identifying, reporting, and resolving unacceptable EMI.

6. Spectrum-use Requirements. During these phases, the JFMO/JSME must finalize initial spectrum-use requirements. These will be subject to change as additional intelligence is acquired and as the force structure, course of action, or schedule is changed.

Determination of the spectrum-use requirements of all spectrum-dependent communications and noncommunications systems is a continuous process, and the JFMO/JSME must be alert to and anticipate changes affecting the JTF spectrum-use requirements.

7. Electromagnetic Environment Assessment. Based on updated intelligence, host-nation coordination, changes in force structure, COA, and initial reports of component or non-JTF forces in the AOR, the JFMO/JSME must constantly reassess the EMB. Actual changes in that environment (new emitters, receivers, topographic, and atmospheric effects) must be analyzed and used to update the JTF EMB data base. All future spectrum authorizations (assignments and allotments) derived from the EMB data base will depend on the accuracy and currency of this data base.

8. Friendly Force Spectrum Authorizations. As a result of unanticipated changes in the force structure, the JFMO/JSME must anticipate new, modified, or additional requirements for spectrum resources.

9. Joint Spectrum Interference Resolution. As forces arrive and begin activating and employing their organic command, control, intelligence, IO, and weapons and surveillance systems, the JFMO/JSME may expect to receive EMI reports. Regardless of the extent of prior planning, the introduction of large numbers of emitters into a given EMB in a constantly changing scenario may be expected to produce incidents of EMI.

The identification, reporting, and resolution of unacceptable EMI must be conducted IAW the procedures specified in the spectrum management plan (see Annex C, Appendix D). When EMI reporting and resolution procedures prove inadequate, or unanticipated changes make the procedures ineffective in the AOR, the JSME may request on-site assistance as outlined in reference j.

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CHAPTER 5

EMPLOYMENT

1. General. Identified herein is a basis for deriving the techniques and procedures the JFMO/JSME will use when engaged in providing spectrum-use management to support the employment phase of JTF operations.

2. Responsibilities. Responsibilities of the JFMO/JSME during the employment phase of JTF operations remain essentially the same as those during the previous phases. Emphasis shifts, however, from planning for spectrum use to coordinating and controlling the actual use of the spectrum in support of the COA.

If not already formed and operating, the J-3 should activate the JCEWS during the employment phase. The J-6, through the JSME, will assist the JCEWS by deconflicting EW operations spectrum use of the JTF and by developing and publishing the JRFL (see Chapter 1 and Enclosure A, Appendix E).

3. Spectrum Use Requirements. The bulk of spectrum requirements were identified during the planning phase and, where possible, met by authorizations made during the deployment and buildup phase.

a. Spectrum use, however, is not static, and component forces may be expected to levy additional spectrum requirements as their maneuvers, missions, and dispositions change. Special operations, such as deception and creation of subordinate JTFs necessary to carry out the JTF mission, will also precipitate a requirement for additional spectrum.

b. Additionally, analyzing the operational EOBs against that of the AOR BEI will reveal instances where frequency substitutions/reallocations will be required to alleviate EMI. When possible, the JSME should satisfy these additional spectrum requirements from within existing resources (spares, reuse, sharing plans). When authorized frequency assets no longer support required re-accommodation, the JSME must seek additional assets from either a higher authority or the host nation.

c. The introduction of commercial and/or leased spectrum-dependent systems by JTF components and elements, State Department diplomatic representatives, the media, welfare and relief agencies, etc, will contribute significantly to the JSME workload. Component forces of the JTF should employ prudent spectrum-use practices and inform the JSME of their emerging spectrum requirements as far in advance as possible.

4. Electromagnetic Battlespace Assessment. The JFMO/JSME assessment of the AOR BEI, conducted during the planning phase, constitutes a best guess based on information available at the time. Additionally, overlaying the operational EOBs over that of the AOR BEI will result in the EMB. Further, the EMB will constantly change as forces redeploy and as C2, surveillance, weapons systems, and other spectrum dependent applications realign.

a. As a result, the JSME must constantly reassess the EMB and prepare to modify spectrum-use plans to accommodate these changes.

b. Solutions to spectrum-use conflicts may dictate acquisition of additional spectrum resources, thus generating a requirement for assets that must be processed as described in the paragraph above on Spectrum Use Requirements.

5. Friendly Force Spectrum Authorization. Prior to authorizing additional spectrum, the JSME must coordinate with all affected organizations such as elements of component forces on the flanks or in the vicinity of the organization receiving the additional frequency authorization or aviation elements that may over-fly the organization receiving the authorization.

a. The JSME must enter the changed/additional authorizations into the EMB data base so that the emitter will be considered in all future assessments and deconfliction of the frequency assignments.

b. Component forces of the JTF must keep their EMB data base current. Component EMB data bases must reflect all authorizations in or near their respective tactical AORs and AOIs that, due to propagation characteristics, overflight, or other reasons, may affect a component's use of the spectrum. Component forces must report periodic updates of their spectrum-use data bases to the JSME and, where appropriate, to other component forces and supporting elements of the JTF.

6. Joint Spectrum Interference Resolution). The JSME should expect EMI upon activation of spectrum dependent equipment at the start of the employment phase. If the EMI incident is unacceptable, it must be resolved. Enclosure A, Appendix B prescribes general EMI reporting, resolution techniques, and procedures. Those of the JTF should be clearly delineated in the JTF spectrum management plan.

7. Joint Commander's Electronic Warfare Staff. The JTF J-6, through the JSME, will function as a member of, or in coordination with, the JCEWS (as established by the J-3). In either case, the JSME will perform two primary functions:

a. Electronic Warfare Deconfliction. EW operations within the JTF AOR/AOI must be deconflicted. As a member of the JCEWS, the JSME must assess the impact of EW operations on the EMB. Appendix E describes JRFL procedures.

b. The Joint Restricted Frequency List. Members of the JCEWS (primarily the J-2 and J-3 representatives) identify the frequencies that must receive various degrees of protection from JTF spectrum-use or Electronic Attack (EA). The JSME compiles these frequencies, together with any frequencies similarly identified by the component forces, to produce the JRFL. The JSME organizes the JRFL, presents it to the JCEWS for J-3 approval, and distributes it throughout the JTF. Compilation and production of the JRFL is a capability of $JSMS_w$ (see Appendix E).

CHAPTER 6

REDEPLOYMENT

1. General. The JTF and any or all of its component forces are subject to redeployment at any time. The JTF may redeploy in its original configuration or restructured for other operations, or it may redeploy to the respective home bases, ports, or garrisons of its constituent elements. Conversely, if changing international political events or crisis actions dictate, the JTF may redeploy in whole or be restructured and be assigned a new mission.

2. Responsibilities. To maintain effective planning, coordination, and control of spectrum use during the redeployment phase, the JSME must continue to function at the same level of proficiency and efficiency as in other phases of the JTF operation. This is particularly true when the JTF redeploys for further operations.

3. Electronmagnetic Spectrum Requirements. The drawdown of spectrum-use requirements needs to be as orderly as the buildup, especially if the JTF is redeploying for further operations. The requirements will transition from operations to logistical and administrative spectrum-use applications.

4. Disbandment. Redeployment for disbandment implies an orderly withdrawal. Under such conditions, operational spectrum use (C3, IO, weapons systems, etc.) to support JTF employment operations will gradually be replaced by administrative and logistical spectrum use required to support the drawdown, reembarkation, and redeployment.

a. The transfer of certain JTF spectrum resources to any US military structure that may remain in place may be required if:

b. The JTF mission was a relief operation or a noncombatant evacuation operation (NEO).

c. The institution or restoration of a host nation governmental structure is to be carried out as a long-term objective following JTF operations.

d. For these operations, component forces and supporting elements gradually relinquish their spectrum authorizations as spectrum-dependent equipment is shut down and reembarked for transportation to home facilities.

1) Air Force. The Air Force component may be expected to continue to operate administrative air control and terminal facilities (instead of combat or tactical) to support air transport operations engaged in redeploying the JTF.

2) Navy. The Navy component may be expected to operate spectrum dependent equipment at port facilities for back-loading JTF elements redeploying by sealift.

3) Army and Marine Corps. If redeployment is to be accomplished by land movement, the Army and/or Marine Corps components will require spectrum to support motor convoy and/or rail operations. Rear guard or security forces may require spectrum support for their missions of protecting the redeployment reembarkation facilities and maintaining order and traffic control during the redeployment phase.

e. This diversion of mission, from an operational course of action to that of an administrative/logistical scenario, will require the JSME to adjust the spectrum-use plan and begin planning the transition of control back to the CINC JFMO. Spectrum resources acquired for full JTF operations will most likely support redeployment operations but may require redistribution of frequency assets.

5. Further Operations. Redeployment for further JTF operations requires recommencing the CAP cycle. If the JTF is to be redeployed as structured, the JSME will thoroughly know the general spectrum requirements. Therefore, much of the spectrum-use plan will apply. Frequency assets required by the JTF in the new AOR will, however, have to be acquired, coordinated, engineered, and authorized.

a. If the JTF is to be restructured for redeployment, the JFMO must again:

1) Determine and consolidate spectrum requirements (especially those of new component forces joining the JTF).

2) Assess the EMB of the new AOR.

3) Establish contact with spectrum management authorities of the new host nation and/or UN force.

4) Revise the JTF spectrum-use plan to support the new course of action in the new AOR.

b. If the JTF is redeploying for further operations, the JFMO/JSME must recommence the CAP process at the planning phase, as described in Chapter 3, to support a new course of action in a new AOR. The JFMO/JSME must plan this concurrently with the execution of drawdown, reembarkation, and transportation spectrum-use and management functions described herein.

c. The JSME, in concert with the JFMO, should develop a transition plan to transfer spectrum management functions from the JSME to the JFMO during movement.

6. Electromagnetic Battlespace Assessment. The ongoing redeployment activities and redistribution of frequency assets will create changes in the EMB, thus precipitating reassessment of that environment. As transportation facilities increase their tempo of operations and as component forces move from their deployed positions to their points of reembarkation, the EMB within the AOR/AOI will present a constantly changing picture

7. Friendly Force Spectrum Authorization. If the JTF redeploys to conduct further operations, the JFMO/JSME will authorize spectrum use as discussed in Chapter 3 and according the techniques and procedures presented in Appendix D. If the JTF redeploys to home facilities and disbands, the JFMO/JSME will:

a. Be prepared to frequently readjust the spectrum-use plan and redistribute frequencies in order to accommodate this changing scenario.

b. Reclaim spectrum resources from users, as these resources are no longer required, and return them to the control of the JFMO, host, or interim government.

8. Joint Spectrum Interference Resolution. Occurrences of EMI may be expected to continue throughout the redeployment phase, and the JFMO/JSME must be prepared to resolve them. While the tempo of combat operations may have decreased, the tempo of unit movement and transportation operations may have increased and will take place in an ever-shrinking geographical area (reference d).

The JFMO/JSME must determine if any further IO operations are scheduled during redeployment phase. If none are, then resolution of EMI incidents and deconfliction will be simplified by the elimination of that factor. At some point in the redeployment phase, the JTF JCEWS may cease to function as an entity in the AOR. At that point, the JFMO prepares to assume full responsibility for EMI resolution and spectrum-use deconfliction.

APPENDIX A

AUTOMATED TOOLS

1. General. The following are joint approved systems for use by the spectrum manager for spectrum management and JCEOI development.

2. Joint Spectrum Management System for Windows ($JSMS_w$).

a. $JSMS_w$ is intended to be used in peacetime by the JTF staff at its permanent headquarters to assist in planning and executing phases of exercises/contingencies, as well as in performing routine spectrum management functions. In a crisis, contingency, or combat situation, $JSMS_w$ is intended to be used by the JTF staff, either at the headquarters or at deployed locations to support spectrum management tasks.

b. Proponent. Joint Chiefs of Staff and the Joint Spectrum Center.

c. Point of Contact. JSC/J5, 120 Worthington Basin, Annapolis, MD 21402-5064, DSN: 281-4956, COM: (410) 293-4956.

Table A-1. System Requirements for $JSMS_w$ version 2.0.

CPU	Pentium x 133 Megahertz (MHz)
Operating System	DOS 6.22 & Windows 3.1/3.11 for Workgroups
Math Coprocessor	66 MHz
Memory	32 MB RAM
Software License	No
Floppy Drives	3.5-inch
Mass Storage	1 GB Removable Hard Disk Drive
Monitor	Color monitor
Printer	Yes
Other	CD-ROM Reader, Mouse
Graphics / Video	VGA Video Card

3. Revised Battlefield Electronic CEOI System (RBECS).

a. RBECS is designed to generate hop sets and transmission security (TRANSEC) keys for the single-channel ground and airborne radio system (SINCGARS) and for signal operation instructions. The system consists of the RBECS software, an NSA-developed random data generator, a user-provided personal computer, and either a printer or a data transfer device (DTD).

b. RBECS has also been adapted to produce JCEOIs. It can be used to generate both the umbrella JCEOI (combining generated JCEOI data from several components under the Joint JCEOI Layer) and supporting force CEOI/SOI to support JTF operations. On 18 October 1993, the Joint Chiefs of Staff (JCS) formally designated RBECS as the joint standard for the generation of JCEOIs, electronic protect (EP) variables (E-sets), and transmission security keys (TSK) for SINCGARS and SINCGARS-compatible radios.

Table A-2. System Requirements for RBECS version 2.1.

CPU	80386 x 25 Megahertz (MHz)
Operating System	MS DOS 5.0 or greater
Memory	4 MB RAM
Software License	No
Floppy Drives	3.5-inch
Mass Storage	20 MB Hard Disk Drive
Monitor	Color Monitor Not Required
Printer	Yes
Other	Standard RS-232 Serial Port
Graphics / Video	No Required Specifications

4. RBECS Merge for Windows V 1.0.

a. The RBECS Merge program is a sister program to RBECS which allows the capability to manipulate raw data into a new data base. The merge capability will be used by selected RBECS operators for the purpose of merging RBECS data bases for a JTF or other combined forces operation.

b. The program is a Windows application that will be a separate stand-alone program from RBECS.

c. Proponent. Program Manager SINCGARS (PM SINCGARS).

d. Point of Contact. PM SINCGARS, Fort Monmouth, NJ DSN: 995-3058, COM: (908) 544-3058.

Table A-3. System Requirements for RBECS Merge for Windows.

CPU	80486 x 33 Megahertz (MHz)
Operating System	Windows 3.1/3.11 for Workgroups
Math Coprocessor	No
Memory	8 MB RAM
Software License	No
Floppy Drives	3.5-inch
Mass Storage	250 MB Hard Disk Drive
Monitor	Color
Printer	Yes
Other	Mouse
Graphics / Video	VGA Video Card

APPENDIX B

JOINT SPECTRUM INTERFERENCE RESOLUTION PROCEDURES

1. General. EMI to C-E equipment is a continuing problem in all military operations. While all spectrum users will at one time or another experience some level of EMI to their C-E systems, it is only when the degree of interference becomes unacceptable that positive action must be taken.

Although EMI may affect mission accomplishment, unacceptable EMI actually impedes operations. It may be caused by friendly, enemy, neutral, or natural sources. Generally, EMI must be solved on a case-by-case basis. Figure B-1 outlines procedures helpful in resolving EMI. Most interference incidents are dealt with at the lowest possible level within the JTF structure. When the cause and recipient of the interference are not within the same component force or supporting element, however, resolution becomes more difficult.

2. Resolving Spectrum-Use Conflicts. Spectrum-use conflicts arise as new requirements for use of the spectrum are identified, and conflicting or competing use of the spectrum should be expected. CJCS Instruction 3220.01 states that "For conflicting or competing use that affects more than one primary functional area, the JCEWS examines requirements and attempts to solve the problem in coordination with the JFMO."

For conflicting or competing use that affects more than one primary functional area, the JCEWS examines its spectrum-use requirements and attempts to resolve the problem. If resolution is not possible at this level, the JCEWS elevates the matter to the joint force commander or his designee, usually the J-3. Automated spectrum management tools, available to the JFMO/JSME, which can deconflict spectrum usage are listed in Appendix A.

3. Reporting Incidents of Unacceptable EMI. Affected users will report incidents of unacceptable EMI. Various service components are usually required and accustomed to reporting EMI incidents in a Service-prescribed format.

4. The JSIR Program. The JSIR program addresses those EMI incidents that cannot be resolved at the component or JTF level. This program is coordinated and managed by the JSC, Annapolis, Maryland. (reference d.)

a. The objective of the JSIR program is to assist the Services and CINCs in resolving persistent, recurring interference that cannot be resolved at the Service or CINC levels. The JSC JSIR team is comprised of active duty personnel and JSC support services contractor personnel.

b. JSC has a 24-hour capability for receiving interference reports. USMTF messages to the JSC JSIR team can be sent to: JSC ANNAPOLIS MD//OP/JSIR//. The JSIR team can also be contacted via voice mail pager at DSN 281-2511, extension 7007, or commercial (410) 573-7007. Special compartmented information traffic is serviced directly through secure facsimile (FAX) and DODIIS/JWICS in the special compartmented information facility (SCIF) at JSC, E-mail address: jscop@nsc.dodiis.

5. Minimum Report Requirements. Information required for the JSIR team to start resolving interference is:

a. The information contained in the component Service interference report.

b. System affected by the interference (nomenclature, J/F-12 number, etc.)

c. Frequency of the victim receiver.

d. Area and/or location where the interference incident occurred.

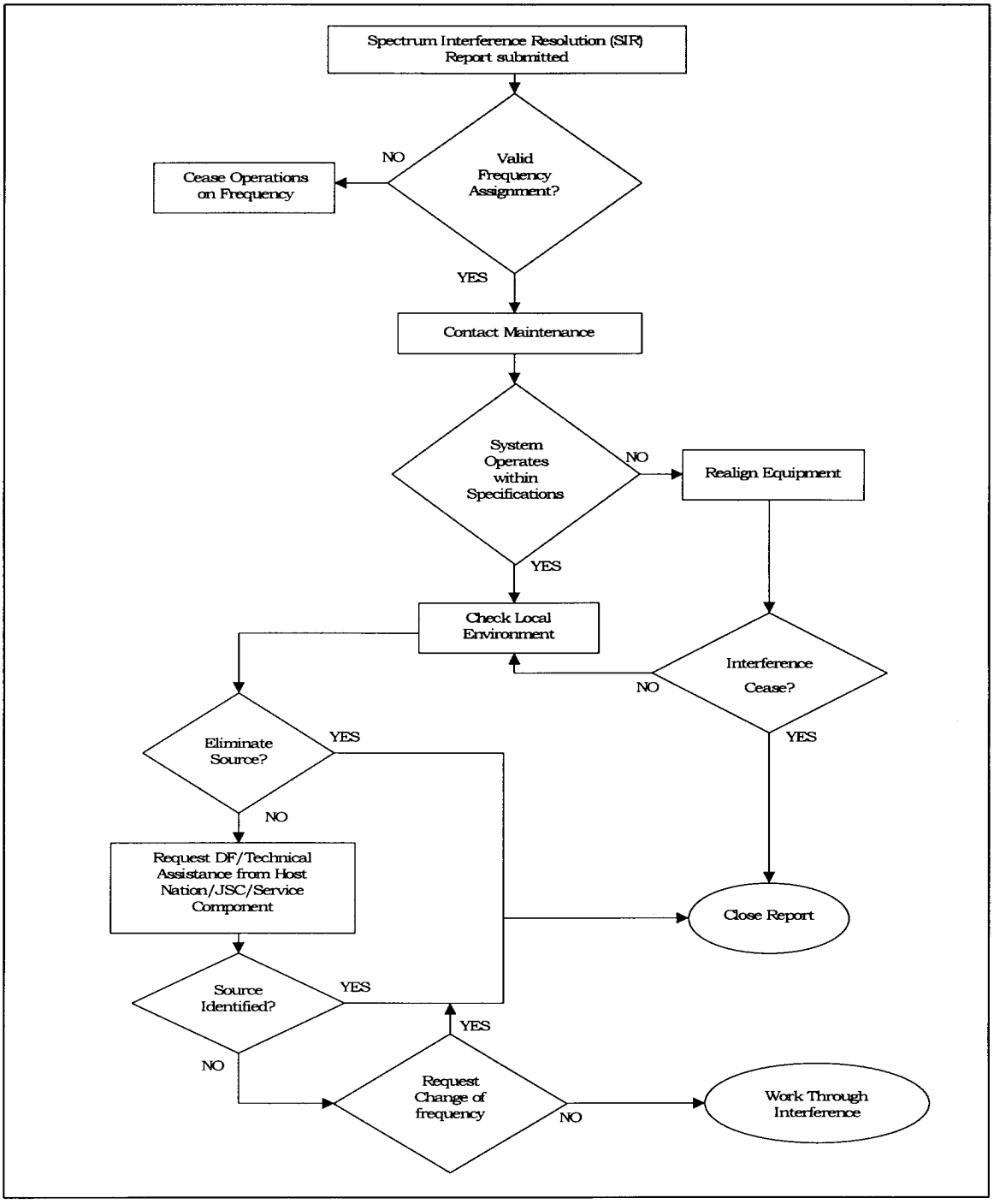


Figure B-1. Interference Resolution.

e. A description of the interference.

f. The times and dates the interference occurred.

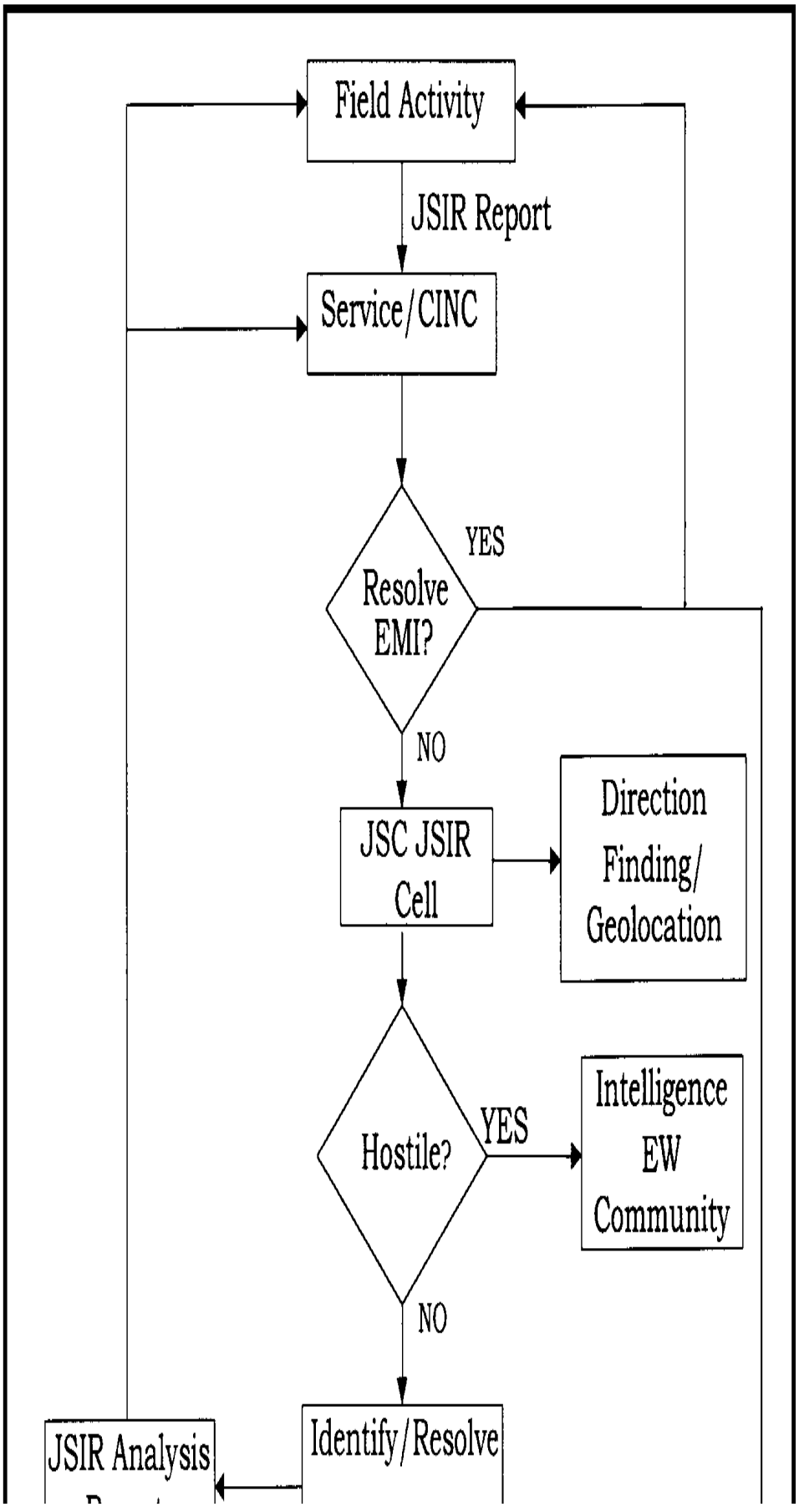
g. A point of contact with DSN (and/or commercial number) and duty hours available to discuss the interference incident.

6. JSC JSIR PROCESS. Upon receipt of a JSIR service request, the JSC JSIR team performs an analysis using JSC models and databases to determine the source, and works with the appropriate field activity and frequency managers to resolve interference problems.

a. The JSC JSIR team will deploy to the location of the victim organization if necessary to resolve interference problems. The JSIR team will provide the organization requesting JSIR services a message report of the results of the JSIR analysis and incorporate appropriate information into the JSIR data base. This data base supports both trend analysis and future interference analyses.

b. The general flow of the reporting and resolution procedures for interference to terrestrial users is depicted in Figure B-2.

c. Space-system interference reporting and resolution processes are similar to the terrestrial reporting/resolution path. See Figure B-3. Interference reports are forwarded up the operational chain of various space systems. Interference that cannot be resolved is ultimately reported to CMOC/SC by USSPACECOM component command centers. The space system is considered to include both space-based and earth segments. CMOC/SCC will forward the incident report to JSC for analysis.


Field Activity
JSIR Report
Service/CINC
Resolve EMI?
YES
NO
JSC JSIR Cell
Direction Finding/ Geolocation
Hostile?
YES
Intelligence EW Community
NO
Identify/Resolve
JSIR Analysis

ndix B

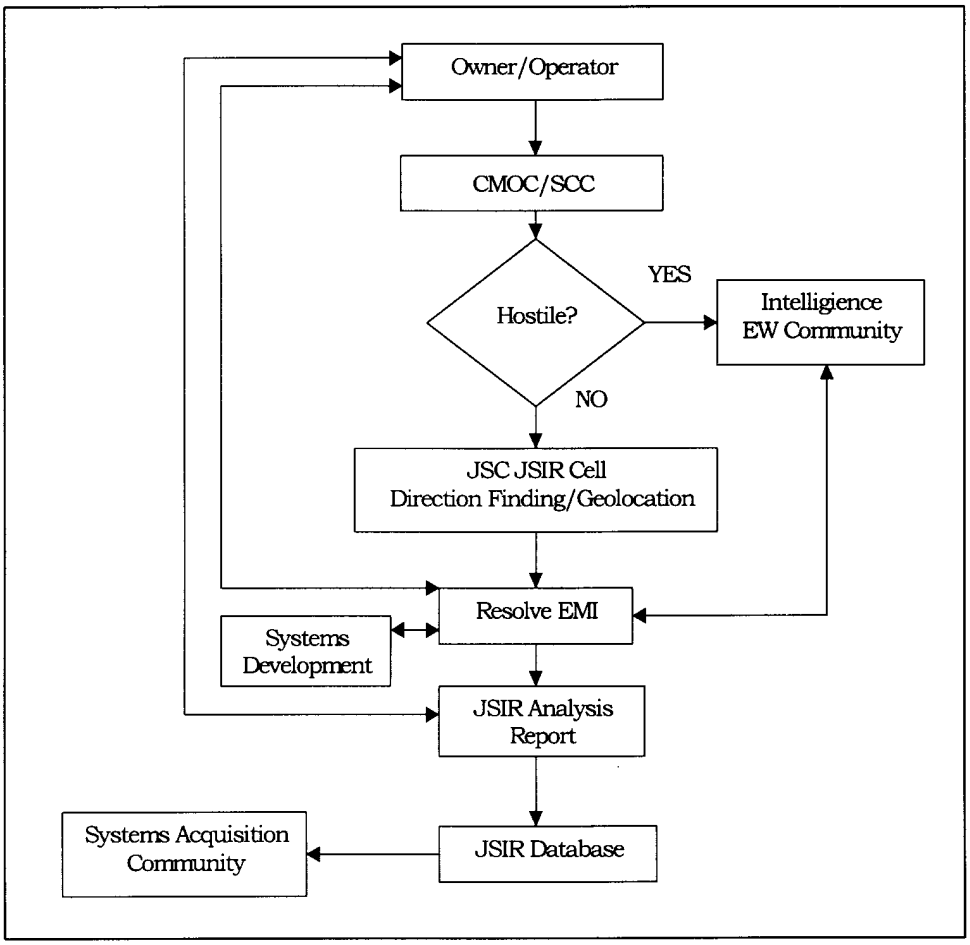


Figure B-3. Space Systems Interference Reporting and Resolution.

APPENDIX C

SUPPORT AGENCIES AND INFORMATION SOURCES

1. Joint Spectrum Center (JSC).

a. CINC Support Teams. The JSC CINC support teams provide spectrum management assistance or support to the CINCs and JTFs. Support includes: JCEOI training, JRFL training, background data base support, and spectrum management software training using JSMSw software. The team is staffed with 7 Non-Commissioned Officers (2 Navy, 2 Army, 2 Air Force and 1 Marine Corps). For additional information contact JSC CINC Support Team, DSN 281-9815, Com (410) 293-9815/3763 (Fax); NIPRNET E-mail operations@jsc.mil.

b. Joint Spectrum Interference Resolution (JSIR) Team. The JSC's JSIR team will analyze and recommend corrective action for reported interference problems by first using the JSC and JSIR data bases, analytical tools, and then, if needed, by providing personnel and equipment to perform on-site direction finding, equipment testing, and problem solving. If the assistance is requested for electronic attack incidents, the JSC JSIR office will coordinate analysis, collection, and field support activities with the appropriate agencies. To request assistance from the JSC JSIR Team, contact it at DSN 281-2511/2411 ext. 7007, Commercial (410) 573-7007, NIPRNET E-mail op-jsir@jsc.mil.

c. Area Studies. Area Studies contain the physical and cultural characteristics and civil telecommunications sector of a specific country. Specific items addressed include: frequency management, broadcasting, telephone, telegraph, and telex, data communications; aeronautical communications; transmission systems (HF, VHF/UHF, SHF, satellite); frequency assignments, frequency density overlays, and frequency assignment histograms for the 0.2-0.5, 2-30, 30-88, 225-400, 406-450, 600-900, 1350-1850, 4400-5000, 7250-8400, and 14500-15350 MHz frequency bands; as appropriate; frequency allocations for the 0.2-0.5, 2-30, 30-88, 138-174, 225-400, 406-450, 600-900, 1350-1850, 4400-5000, 7250-8400, and 14500-15350 MHz frequency bands; general propagation information for reliable in-area and long-haul communications, groundwave planning ranges, maximum usable frequencies for short-distance HF skywave communications, HF Defense Communications System (DCS) entry reliabilities, magnetic azimuths and distances from in-area site to selected HF DCS entry stations, look angles from in-area sites to selected geostationary satellites. Also included are two 3.5-inch high-density floppy disks. The first disk contains a data base of the frequency assignments listed above, and can be accessed using the software provided on the floppy disk. The second disk contains the same frequency assignments in vertical SFAF format for use with $JSMS_W$.

A list of countries for which studies have been completed is provided in Table C-1. For information contact the JSC Area Studies Team at DSN 281-2217, Commercial (410) 293-2217; to receive current area studies contact the JSC Operations Directorate at (410) 293-9814, NIPRNET e-mail operations@jsc.mil.

d. HF Predictions and Propagation Studies. The JSC provides HF prediction and propagation studies to Military Departments to enable the user to determine circuit reliabilities for the most combinations of power, emission, and antennas. Additional information can be obtained from the JSC at DSN 281-2814, Commercial (410) 293-2814.

e. Frequency Resource Record System (FRRS)/Distributed Central Facility (DCF) Access. The JSC's FRRS is a worldwide record-keeping system managed by the Military

Communications-Electronics Board (MCEB) and used by DOD frequency managers who require frequency data and background environment information. The system operates on a worldwide computer network. This network consists of a Central Computer Facility (CCF) located at the JSC, Annapolis, MD, Distributed Computer Facility (DCF)s located throughout the United States and various overseas locations, intermediate commands, installation frequency management offices, and some operating units. Use of this system ensures the effective and efficient use of the electromagnetic spectrum. Area CINCs can provide information on the requirements for establishing a FRRS account on the DCF within their area of responsibility.

2. The Joint Command and Control Warfare Center (JC2WC). The JC2WC was established in September of 1994 by the Chairman of the Joint Chiefs of Staff to serve, through the Director of Operations (J-3), as the principal field agency for C2W. Located at Kelly AFB in San Antonio, TX, the JC2WC provides direct C2W support to operational commanders as well as performing a number of ancillary tasks concerned with operationalizing the concept of C2W in all theaters. The JC2WC supports the integration of the constituent elements of C2W—operations security (OPSEC), physiological operations (PSYOP), military deception, electronic warfare (EW), and destruction and others in joint plans and operations. Direct support is provided in the following priority order: joint force commanders (combatant commanders, subordinate unified commanders, and joint task force commanders), functional component commanders, and Service component commanders. Support is also provided to the Office of the Secretary of Defense (OSD), the Joint Staff, Military Services, United States Government (USG) agencies, North Atlantic Treaty Organization (NATO), and selected allied nations. For more specific information see CJSCI 5118.01, September 1994, or contact the Deputy Director for Operations at 969-2911.

3. National Imagery and Mapping Agency (NIMA). NIMA provides Digital Terrain Elevation Data (DTED Level 1) for use with JSMSw Topographic Manager (TopoMan) and ARC Digitized Raster Graphic (ARDG) formatted map data that is used for various engineering tools to include the Mobile Subscriber Equipment Network Planning Terminal (MSE-NPT). NIMA also produces the DOD Flight Information Publication (FLIP) which provides a good source for worldwide communications at airport facilities. Information on NIMA products may be obtained by calling the NIMA Customer Help Desk at 1-800-455-0899, Commercial (314) 260-1236, DSN 490-1236, fax (314) 260-1128, NIPRNET e-mail chdesk@nima.mil, Internet Home Page http://www.nima.mil.

4. HQ US Space Command. HQ US Space Command, located in Colorado Springs, CO, publishes in message form, the “Monthly Blue Space Order of Battle” which provides position and other related satellite data. For information and distribution of the Blue Space Order of Battle, contact HQ US Space Command at DSN 692-5084.

5. Air Force Space Forecaster Center (AFSFC)/National Oceanic and Atmospheric Administration (NOAA). The AFSFC in conjunction with the NOAA transmits a daily solar and geophysical activity summary via AUTODIN message. This message includes the 10.7-cm daily solar flux value obtained from Ottawa, Canada observatory. For Information call DSN 560-6264/6311, Commercial (719) 567-6264/6311.

6. Background Data Base Information and Data Base Support.

a. Frequency Resource Record System (FRRS). The FRRS CD-ROM data base contains some Department of Defense (DOD) records that are assigned worldwide. The CD-ROM is classified CONFIDENTIAL. For information and distribution, contact JSC data base support at DSN 281-2511 ext. 7743 or commerical (410)573-7743.

b. Government Master File (GMF). The GMF CD-ROM data base contains government frequency assignment records within the United States and

Possessions (US & P) that have been submitted to the Interdepartment Radio Advisory Committee (IRAC) for approval. This CD-ROM is classified CONFIDENTIAL. For information and distribution, contact the National Telecommunications and Information Administration at (202) 482-1132.

c. Federal Communications Committee (FCC) Records. The FCC CD-ROMs contain nongovernment records within the US&P. These records are available on CD-ROM by FCC region. These records are unclassified. For information and distribution, contact JSC data base support at DSN 281-2511 ext. 7743 or commerical (410)573-7743.

d. International Telecommunications Union (ITU). The ITU CD-ROM data base contains records from the International Frequency List (IFL). Nations that have notified and registered their frequency assignments with the ITU are contained on this CD-ROM. For information and distribution, contact JSC data base support at DSN 281-2511 ext. 7743 or commerical (410)573-7743.

e. NATO Frequency Management Subcommittee/Master Radio Frequency List (FMS/MRFL). The MRFL data base contains North Atlantic Treaty Organization (NATO) frequency assignment records that have been converted from 14 point format to vertical SFAF records. For information contained in the FMS/MRFL records, contact JSC data base support at DSN 281-2511 ext. 7204 or commerical (410) 573-7204.

7. Commercial Sources. Two publications – the World Radio and TV Handbook (WRTH) and the World Satellite & TV Handbook provide information on International radio and television broadcasting stations, as well as amateur radio stations, satellite coverage and stations. These books are published by Billboard Books and are available at bookstores. For information concerning these publications, write to BPI Communications, 1515 Broadway, New York, NY, 10036.

Table C-1. JSC Area Studies.

AFGHANISTAN	HAITI	PAPUA NEW GUINEA
AFRICA (SOUTH)	HONDURAS	PARAGUAY
ALEUTIAN IS.	HONG KONG	PORTUGAL
ALGERIA	HUNGARY	PERU
ARGENTINA	ICELAND	PHILIPPINES
AUSTRALIA	INDIA	PUERTO RICO
AZORES	INDONESIA	QATAR
BAHRAIN	IRAN	RWANDA
BANGLADESH	IRAQ	SAUDI ARABIA
BARBADOS	ISRAEL	SENEGAL
BERMUDA	ITALY	SEYCHELLES
BOLIVIA	JAMAICA	SINGAPORE
BRAZIL	JORDAN	SOLOMON ISLANDS
BRUNEI	KENYA	SOMALIA
BURMA	KOREA (NORTH)	SPAIN
BURUNDI	KOREA (SOUTH)	SRI LANKA
CAMBODIA	KUWAIT	SUDAN
CANARY ISLANDS	LAOS	SURINAME
CHAD	LATVIA	SYRIA
CHILE	LEBANON	TAIWAN
CHINA	LIBERIA	TANZANIA
COLOMBIA	LIBYA	THAILAND
COSTA RICA	MACAU	TOBAGO
CUBA	MALAYSIA	TRINIDAD
CYPRUS	MARSHALL IS.	TRUST TERRITORY PACIFIC
CZECH REPUBLIC	MAURITANIA	TUNISIA
DENMARK	MEXICO	TURKEY
DIEGO GARCIA	MICRONESIA	UGANDA
DJIBOUTI	MOROCCO	UNITED ARAB EMIRATES
DOMINICAN REPUBLIC	NEPAL	URUGUAY
ECUADOR	NEW CALEDONIA	VENEZUELA
EGYPT	NEW ZEALAND	VIETNAM
EL SALVADOR	NICARAGUA	VIRGIN ISLANDS
ETHIOPIA	NIGER	WESTERN SAHARA
FIJI	NIGERIA	YEMEN (NO/SO)
FRENCH GUIANA	NORWAY	YUGOSLAVIA
GAMBIA	OMAN	ZAIRE
GREECE	PAKISTAN	ZAMBIA
GUATEMALA	PANAMA	
GUYANA		

APPENDIX D

SPECTUM MANAGEMENT DURING THE PLANNING PROCESS

1. Introduction. Quick military reaction to crisis situations in the world requires that precrisis planning be accomplished and that information be made readily available to the JFC. CINCs plan and theater Service component commanders develop CONPLANs and OPLANs for possible crisis and required military operations.

2. Deliberate Planning. The JFMO performs several functions on a daily basis, which center on preparedness for execution of contingency plans. The JFC establishes the JSME to support joint planning, coordination, and control of the EMB for assigned forces. The JFMO and JSME perform spectrum-use planning, documentation and coordination to fulfill these responsibilities. Depending on when the JSME is brought into the CAP process the JFMO should perform tasks to facilitate a smooth transition to the JSME. This is critical since the time constraints placed on the JTF may be minimal.

The following table will assist the JFMO, Joint Service Theater Commands, and Theater Service Component Commands in deliberate planning. Note these are only suggestions since every CINC and JTF plans are different; these tasks should be modified to fit the specific needs of the CINC, OPLANs, and the AOR as necessary.

Table D-1. Deliberate Planning Checklist.

Create Spectrum Management Manual (SMM)	
	To promulgate spectrum use policy, procedures, and guidelines.
Maintain library of equipment technical data.	
	To develop spectrum-use plan
Terrain Data	
· DTED	To perform EW Deconfliction and Interference Analysis
· ARDG	Aid in performing EW Deconfliction and Interference Analysis when DTED is unavailable. Also for Mobile Subscriber Equipment Network Planning Terminals.
· Paper Products	Aid in EW Deconfliction and Interference Analysis when DTED is unavailable.
BEI (EME combined with E3)	
· HERO	Consider electromagnetic effects to ordnance when planning joint operations.
· FRRS	Database of Current Assignments.
· Standing Theater JRFL	Current listing of Taboo, Protected and Guarded Frequencies in the CINC AOR.
· Area Studies	To extract spectrum-use data in AOR.
· ITU	To extract spectrum-use data in AOR.
· Intelligence Sources	To extract spectrum-use data in AOR.
Review of OPLANS	
	Estimate of Force Structure.
	Estimate of Spectrum-Use Requirements

	To ensure spectrum use considerations are included. To ensure augmentation or support is included. Review for any UN, host-nation, or coalition force spectrum-use. To become familiar with previous deficiencies
· JULLS	To become familiar with previous deficiencies
Maintain Library	
· Service Unique Manuals.	Aid in spectrum-use planning.
· UN, Coalition, Allied Forces Manuals.	Aid in spectrum-use planning.
· Joint Policy, Procedures, and Guidelines.	Aid in spectrum-use planning.
· Software Manuals.	Aid in utilization or software.
· FLIP	Aid in the EME study of AOR.
· World Radio & TV Handbook and Satellite and TV Handbook	Aid in the EME study of AOR.
JCEOI Development	
· Master Net List of all possible component forces.	Aid in JCEOI Development.
· Callword dictionaries.	Aid in JCEOI Development.
· Current CINC suffix and expander listing.	Aid in JCEOI Development.
Training Plan.	
	To ensure quality of force.
· Policy and Procedures	Familiarize and standardized procedures.
· CINC SMM	Familiarize and standardized procedures.
· Service Unique Procedures.	Familiarize and standardized procedures.
· Joint Policy and Procedures.	Familiarize and standardized procedures.
· UN, Allied, and Coalition Force Policy.	Familiarize and standardized procedures.
· Spectrum Management Software.	
· $JSMS_w$	To perform spectrum management tasks.
· RBECS	To perform spectrum management tasks.
· FRRS	To perform spectrum management tasks.
Deployment Equipment	
	In sufficient quantity to support JSME.
· Computer and Peripherals	To operate spectrum management software.
· Computer Communication Device(s).	To support connectivity with other spectrum management sites.
· Printer	To support the display of information.

3. Crisis Action Planning. Since each crisis is unique, it is not reasonable to expect to use a rigid set of rules in our response to every situation. CAP was put into effect in 1976 by the JCS as a system for time-sensitive military planning. The result of these steps is the ability to develop an adequate and transportation-feasible military response during a time-constrained planning process. The procedures are

categorized into six phases. Each phase of CAP begins with an event, such as the receipt of a report or order, and ends with a decision or resolution of the crisis. The JFMO must accomplish all spectrum related planning or tasks required until the JSME is established.

a. Situation Development. This phase is triggered by the occurrence of an event where there is a possible security implication for the United States or its interests. The event is recognized, analyzed, and reported. The JFMO should be aware of the developing situation and determine the necessity to gather updated information and refresh knowledge on any plans that exist for the developing situation. Potential harmful electromagnetic radiation to ordnance (HERO) effects should be considered to prevent catastrophic detonation of munitions. (Munitions from one Service are not designed for operations across all environments.) This phase ends when the CINC report is received by the NCA and an assessment is submitted.

b. Crisis Assessment. In this phase the NCA and JCS analyze the situation to determine whether military options should be prepared to deal with the evolving problem. The JFMO should increase information gathering and review all available options. This phase ends with the decision of the NCA to have military options developed.

c. Course of Action Development. During this phase the CINC is presented with all available options for action. The JFMO, augmented by theater Service component spectrum managers, begins to develop the spectrum management concept for the possible JTF operation. The interaction between planning cells is critical to allow spectrum related issues to be considered and provide the JFMO staff a better understanding of the crisis situation. Phase is complete upon release of CINCs estimate of the COA.

d. Course of Action Selection. During this phase the NCA receives the COA brief and selects a COA and forwards that decision to CINC for the beginning of execution planning. During this phase the force structure should be solidified and the JFMO/JSME should begin finalization of the spectrum management concept.

e. Execution Planning. In this phase the supported commander transforms the NCA-selected COA into an OPORD. In order to execute the approved COA, detailed planning is performed. The actual forces, sustainment, and strategic transportation resources are identified, and the concept of operations is described. This phase ends with the NCA decision to execute the OPORD, place it on hold, or cancel it pending resolution by some other means.

f. Execution. The Secretary of Defense will authorize CJCS to issue an execute order that directs the CINC to carry out the OPORD. The CINC then issues an executive order to subordinate and supporting commanders that directs the execution of their OPORDs.

CAP Phase 1 Crisis Action Planning	
	Review OPLANs & CONPLANs.
	Availability of data (DTED, ARDG, Area Study)
	Improve data bases from those collected in deliberate planning specifically for AOR.
CAP Phase 2 Crisis Assessment	
	Gathers BEI from sources available.
	JFMO receives augmentation, as necessary.
CAP Phase 3 Course of Action Development	
	Interaction with other planning cells to consider spectrum-related issues in all planning.

	Develop understanding of crisis situation.
	Continue gathering AOR EME.
	Consider harmful electromagnetic effects to ordnance (HERO) when planning joint operations.
	J-5 establishes coordination channels, if needed.
	Develop initial spectrum management concept.
	Develop contact list, phone, fax, SIPRNET.
	Host nation allocation tables, as needed.
	Maintain currency of all AOR assignments.
	Merge spectrum-use assumptions with current known force structure.
CAP Phase 4 Course of Action Selection	
	Finalize the spectrum management concept.
	Data call for spectrum-use and JCEOI inputs.
	Special spectrum-use requirements non-military (e.g. diplomatic, media, morale/welfare,etc.)
	Out of band requirements.
	Coordinate with UN, host-nation, and allies for spectrum-use.
	Finalize spectrum-use plan.
	JSME augmentation and support.
	EW requirements.
	Outside agency operational and planning support
CAP Phase 5 Execution Planning	
	Finalize spectrum management Annex to OPORD.
	Participate in JCEWS.
	Compile and submit draft JRFL to JCEWS.
	Publish Spectrum Management Annex.
CAP Phase 6 Execution	
	Assess the Spectrum-Use Plan with the EME to define and analyze the EMB.
	Reuse and sharing plans established in congested bands (e.g. M225-400).
	JOPES input.
	Identify movement plans through TPFDD.
	Distribute allotment plans and assignments.
	Publish JCEOI and JRFL.

4. Executional Phases. During the execution of an OPORD there are many phases and special considerations for each.

a. Predeployment.

1) Communication. The JFMO/JSME needs to ensure that communications are available to link all spectrum management functions together. Alternate means of communications should be considered to prevent isolation. A timeline needs to be established to transfer authority from the JFMO to the JSME when the JSME deploys forward. All units need to be aware of who is the assignment authority during that planned timeline.

2) Distribution. The JFMO/JSME should distribute the initial spectrum-use plan, JCEOI, JRFL, and spectrum management annex to communications appendix, the common EMB data base, with updates to functional levels.

3) Equipment and Personnel. Time needs to be allotted for all

augmentees and support to receive personnel deployment checks, and to be briefed on the overall concept of the operation.

4) Security. Information must be safeguarded during all phases but especially during this phase due to the critical need for force protection and essential elements of friendly information (EEFI).

b. Deployment.

1) The deployment of a JTF involves the loading, transport, and assembly in the AOR of forces assigned to the JTF. Transport may be by air, land, or sea or a combination thereof. The JFMO/JSME must have the information contained in the JOPES and TPFDD to determine the force structure and to know the embarkation and debarkation schedules of the JTF component forces in order to assign, allot, and coordinate the necessary spectrum-use authorizations.

2) Spectrum-Use Plan. The spectrum-use plan actions taken during the deployment phase are continuations of related tasks begun during the planning phase of the operation. Additional frequency requests are reviewed, evaluated, and coordinated with host-nation frequency management personnel. Coordination procedures contained in reference b or those established by J-5 should remain in effect. Allotment plans should be reviewed to determine if any additional spectrum resources should be provided to a component. Allotment plans and assignments should periodically be evaluated as participating units or component requirements may significantly change during the different phases of the operation. The J-2, J-3, and J-6 should review the frequencies in the JRFL to identify any changes required as a result of a modification to the COA or a change in activity in the AOR. Annex E to this appendix provides a description of the data fields for the JRFL.

c. Employment Phase. Throughout the employment phase of a JTF, the JSME must constantly anticipate and support fluctuating spectrum-use requirements resulting from changes in the EMB.

1) Resolving Spectrum Use Conflicts. The JSME analyzes intelligence; operations; EW; C4, etc., requirements to identify potential spectrum-use conflicts. When conflicts are identified or reported, the JSME works to resolve those conflicts, i.e., deconflict. Spectrum-use conflicts that cannot be resolved by the JSME will be referred to the JCEWS. Those conflicts not resolved by the JCEWS will be referred to the J-3.

2) Deconfliction. Deconfliction may be accomplished by changing the frequency for one or more of the users; by changing the parameters used, e.g. reducing effective radiated power; by changing the antenna type or orientation; by time-sharing use of the frequency; or by increasing the separation distance between the equipment affected.

3) Electromagnetic Interference Resolution. A significant amount of EMI can occur at the start of the employment phase when the JTF activates large numbers of spectrum dependent equipment and when JTF spectrum-use is overlaid on the AOR EME. These and other EMI incidents should be resolved using the procedures in Appendix B.

d. Redeployment. This process includes the phased removal of forces from the AOR. This will free resources for handover to the provisional government, UN forces etc. Assets must be redistributed and redefined as the role of forces changes from an operational mission to that of administrative/logistical one.

1) Spectrum-Use. Requirements for use of the spectrum will continue throughout the redeployment phase

until all participating forces have departed from the area of operations. Frequency requirements for combat forces will be reduced, while other requirements for services such as humanitarian support, civil affairs, and rear-area security will increase. Modifications to frequency-use plans may be required to reflect the changes in the composition, roles, and missions of the participating forces during this phase of the operation.

2) Transfer of Database Information.

a) The transfer of information between the component frequency-management offices and the JSME will continue to be required during the redeployment phase until a component ceases to participate in the operation and all necessary frequency-management actions are completed; for example, frequency assignments no longer required are canceled, their records are deleted from the database, unused frequency resources returned to host nation, etc. A copy of the frequency assignments and allotments existing at the termination of a component's or a JSME's participation should be archived for possible use in future exercises or contingencies.

b) Spectrum management responsibility may be transferred between organizations during any phase of an operation. However, this transfer is more probable during the redeployment phase when the majority of the tasks may be assigned to a single component. The JSME must develop a transition plan as to when the spectrum management responsibility is to be transferred between organizations. The spectrum management responsibility must be transferred in an orderly manner and any changes in procedures, personnel, telephone numbers, etc., must be provided to the organizations affected.

c) The JSME must develop special plans and procedures if the hardware used for automated tools is to be changed. The transfer of data should require only a few hours if the computers are electronically linked. However, this process can take significantly longer if the software programs and database information is to be loaded from disks. The JSME must assure availability of the proper hardware, software, procedures, and time required prior to the transfer of frequency management responsibility between organizations.

3) Transfer of Responsibility. If the JTF is to be dissolved, the responsibility for spectrum management will transfer from the JSME to the JFMO during or at the end of the redeployment phase. Until this transfer occurs, the responsibility for day-to-day spectrum management remains with the JSME.

Table D-3. Operational Phases.

Predeployment	
	Receive and review frequency request for completeness, accuracy, and compatibility.
	Develop transition plan from JMFO to operational JSME
	Identify communication to all JTF spectrum managers.
	Distribution of critical information.
	Readiness of personnel and equipment.
	Security of EEFI
	Deploy to forward area.
	JSME operation and connectivity
	EME, AOI, and AOR data base updates.
Deployment	
	Receive and review frequency request for completeness, accuracy, and compatibility
	Identifies and transfers data bases as necessary.
	Develops procedures for the transfer of data bases.
Employment	
	Receive and review frequency request for completeness, accuracy, and compatibility
	Ensure sufficient spectrum is assigned or allotted for all spectrum dependent systems.
	Allot additional frequencies to components as identified, create needed reuse or sharing plans based on geographical separation or use.
	Coordinate use of spectrum resources with UN, host nations, and allies.
	Update JRFL
	Coordinate with JCEWS on EW deconfliction.
	Identifies and proposes solution to JCEWS spectrum-use conflicts
	Attempts to resolve EMI and reports if necessary.
	Updates spectrum-use information for J3 inclusion in the JOPES.
	Develops transition plan back to the JFMO.
Redeployment	
	Receive and review frequency request for completeness, accuracy, and compatibility
	Identifies updates and transfers data bases.
	Satisfies requirements for intermediate staging bases, points of embarkation etc. for smooth operation of redeploying units.

ANNEX A TO APPENDIX D

ALLOTMENT PLAN PROCESS

1. An allotment plan identifies small bands or groups of frequencies within a specified spectrum-use plan for use by a specific organization or for a particular function. The use of an allotment plan enables the joint force commander to maintain overall control of spectrum use in the AOR, and at the same time decentralizes authority to the lowest level.

2. Allotment plans are normally developed for, but not limited to, HF (2-30 MHz), VHF (30-88 MHz and 118-174 MHz), and UHF (225-400 MHz) bands. The frequency allotments in each of these plans must be based upon a ratio of air, land, and sea forces for a particular operation or mission and an assessment of their spectrum requirements. Planners should consider spectrum-use restrictions when developing an allotment plan.

3. Planners obtain the spectrum-use requirements on which the allotment plan is based are obtained from the CINC; J-2, J-3, and J-6 staff elements and components; the JCEOI Net List; and any UN, allied, or coalition forces, if known. When developing an allotment plan, the developer must consider joint and/or multinational-force equipment capabilities, host-nation allocations and restrictions, RF requirements for wide area assignments, jam-resistant equipment, navigational aids, wartime reserve mode (WARM); and equipment that requires specified frequencies.

4. JFMO/JSME planners must evaluate all requirements in the allotment plan for electromagnetic compatibility (EMC) and eliminate any potential conflicts. If all of the requirements cannot be satisfied, the JCEWS must attempt to resolve conflicts based upon operational priorities. The JCEWS will refer the situation to the J-3 if it cannot resolve the conflict.

5. The following details the steps for creating an allotment plan.

a. Is there an existing channeling plan for the frequency band?

1) Yes - Begin development of allotment plan at paragraph 4.

2) No - Begin development of allotment plan at paragraph 2.

b. Divide band into individual channels (uniform bandwidths or mixed).

c. Begin with all channels in the band as candidates.

d. Block known existing/denied frequency assignments:

1) Allocated for other/special use, e.g. NAVAIDS (ILS Glide-slope).

2) U.S. permanent frequency assignments in AOR.

3) IFL listings in and within interference distance of AOR.

4) Host-nation/neutral-nation frequency use.

5) U.S., UN, and Coalition forces' specific frequency requirements.

a) Satellite frequencies.

b) Fixed-frequency equipment.

c) Special frequency complements, (e.g., spread-spectrum hop sets, etc.).

d) Frequencies for JTF HQs/JCS controlled assets.

e) Other frequencies as required.

e. Identify U.S. and Coalition forces' spectrum-use requirements

(Requirements should be presented in numbers of nets, circuits, etc. for translation into the number of frequencies required).

f. Analyze requirements for separation distances (minimum and maximum), channel size(s) and bandwidth(s) requirements.

g. Determine percentage requirements for coalition and component forces based upon requirements.

h. Allot remainder of available channels to participating forces based upon percentage of requirements.

i. An allotment plan is usually conveyed to the user in a simple format that contains a listing of the frequencies derived through the (process described above) and preceded by a paragraph specifying all restrictions applying to the allotted frequencies, e.g., transmitter power, authorized emission and bandwidth, geographical location, maximum transmitter altitude, function, etc.

ANNEX B OF APPENDIX D

JOINT NETS

The following is a list of CINC and JTF nets that were extracted from reference h.

1. CINC Nets.

CINC 1. CINC Command Net -- Secure UHF SATCOM voice net connecting the supported CINC, CJTF, and selected subordinates.

CINC 1A. CINC Command Net -- Secure HF-SSB voice net connecting the CINC, CJTF, and selected subordinates.

CINC 1B. CINC Command Net -- Secure SHF SATCOM data net connecting the supported CINC and selected subordinates.

CINC 2. CINC Mission Radio Net (CMRS) -- Nonsecure HF-SSB voice net supporting Security Assistance administrative matters.

CINC 3. Command Data Net -- Secure HF data net between supported CINC and CJTF.

CINC 3A. Command Data Net -- Secure HF data net between supported CINC and COMUSFOR (country).

CINC 3B. Command Data Net -- Secure HF data net between supported CINC and COMDEFCOM.

CINC 4. CINC Special Intelligence Net -- Secure HF-SSB data net linking supported CINC, CJTF, and selected special intelligence elements.

CINC 5. Special Intelligence Teletype Circuit -- Duplex 100 WPM secured teletype circuit between USCINCLANT and COMUSFOR COUNTRY. Circuit becomes operational upon activation of COMUSFOR COUNTRY in the objective area.

CINC 5A. Special Intelligence Teletype Circuit -- Duplex 100 WPM secured teletype circuit between USCINCLANT and CJTF 140 when forward deployed. Circuit is to become operational upon activation of CJTF 140 by USCINCLANT.

CINC 6. Tactical Missile Alerting Net -- Secure UHF SATCOM voice alert broadcast net to CJTF and in-theater forces. Established upon direction of CJTF.

2. JTF Nets.

JTF 3. Embassy Emergency/Voice Command Net -- Nonsecure HF-SSB voice net between military commanders and embassy in the area of the crisis.

JTF 3A. Embassy Emergency/Voice Command Net -- Secure VHF-FM voice net between military commanders and embassy in the area of the crisis.

JTF 3B. Embassy Emergency/Data Command Net -- Secure HF-SSB Data net between military commanders and embassy in area of crisis.

JTF 5. Out-Of-Country Net -- Secure/nonsecure UHF SATCOM voice net providing the CJTF and component headquarters with DSN access via a satellite ground entry station.

JTF 6. Noncombatant Evacuation Net -- Nonsecure HF-SSB voice net to link selected evacuation points and elements being evacuated.

JTF 6A. Non-Combatant Evacuation Net -- Nonsecure HF-SSB voice net activated by CJTF or senior objective area commander to link selected evacuation points and elements being evacuated.

JTF 7. Joint Medical Regulation Net -- Nonsecure HF-SSB voice net linking CJTF-designated medical authorities.

JTF 7A. Joint Medical Regulation Net -- Nonsecure VHF-FM voice net linking

CJTF-designated medical authorities.

JTF 8. JTF Objective Area Special Intelligence Net -- Secure HF-SSB data net linking supported CINC, CJTF, and selected special intelligence elements.

JTF 8A. JTF Objective Area Special Intelligence Voice TACSAT net -- Secure UHF SATCOM between CJTF and subordinate/supporting commanders.

JTF 11. Joint Command Net -- Secure UHF SATCOM net for CJTF and components.

JTF 11A. Joint Command Net -- Secure HF-SSB voice net (backup to JTF 11).

JTF 12. Joint Administrative/Logistics Net -- Secure UHF SATCOM voice/facsimile net connecting CJTF and subordinate forces to coordinate routing administrative and logistical requirements.

JTF 12A. Joint Administrative/Logistics Net -- Secure HF-SSB voice (backup to JTF 12).

JTF 17. Joint/Combined Search and Rescue (SAR) Net -- Nonsecure HF-SSB voice net linking SAR elements.

JTF 17A. Joint/Combined Search and Rescue (SAR) Net -- Nonsecure UHF voice net linking the SAR elements.

JTF 17B. Joint/Combined Search and Rescue (SAR) Net -- Nonsecure VHF-FM voice net. Links SAR elements.

JTF 18. JTF Communications Engineering Net -- Secure HF-SSB voice net for coordination relating to communications systems operation.

JTF 19. Joint Information Bureau Net -- Nonsecure HF-SSB operated in accordance with special instructions promulgated by the supported CINC Joint Information Bureau.

JTF 19A. Joint Information Bureau Net -- Nonsecure VHF-FM operated in accordance with special instructions promulgated by the supported CINC Joint information Bureau.

JTF 23. JTF Objective Area Voice Command Net -- Secure VHF-FM voice command net linking JTF forward-deployed element in the objective area with designated subordinates.

JTF 24. Medical Evacuation Net -- Nonsecure VHF-FM voice net linking JTF units for purpose of medical evacuation.

JTF 24A. Medical Evacuation Net -- Secure UHF SATCOM data net between JTF field hospital and area of operation medical center.

JTF 70. Commander Joint PSYOP NET -- Configuration to be promulgated when activation is required.

JTF 75. Joint Counter Intelligence Coordination Net -- Configuration to be promulgated when activation is required.

JTF 81. Joint Supporting Arms Coordination Net -- Secure HF-SSB voice nets for component forces to coordinate with CJTF concerning supporting arms for fire which impact outside of the Task Force areas of operation.

JTF 81A. Joint Supporting Arms Coordination Net -- Secure VHF-FM voice nets for component forces to coordinate with CJTF concerning supporting arms for fire which impact outside of Task Force areas of operation.

JTF 82. Naval Fire Control -- Secure or nonsecure HF-SSB voice net used to pass mission status and relief reports from the firing ships to CTF___SACC.

JTF 83. Naval Fire Support Net -- Secure HF-SSB voice net supporting requests for fire, ship assignments, and orders pertinent to execution of fires.

JTF 84. Naval Fire Ground Spot Net -- Secure HF-SSB voice net between Shore Fire Control Party (SFCP) and assigned direct support gunfire ship.

JTF 84A. Naval Fire Ground Spot Net -- Secure VHF-FM voice net between Shore Fire Control Party (SFCP) and assigned direct support gunfire ship.

JTF 85. Joint Link-up Net -- Secure VHF-FM voice net to coordinate rendezvous of separate elements or the rejoining of detached elements to parent organizations (multiple discrete frequencies).

JTF 86. Naval Fire Ground Spot (Expansion Net) -- Secure or nonsecure net to call for and adjust fire for units of TF ____. Assignments of SFC SPOT net to the firing ship and SFC SPOT team will be made on JTF-82 by CTF _____SACC.

JTF 87. Naval Fire Ground Spot (Expansion Net) -- Secure or nonsecure net to call for and adjust fire for units of TF____. Assignments of SFC SPOT net to the firing ship and SFC SPOT team will be made on JTF-82 by CTF____SACC.

JTF 88. Naval Fire Ground Spot (Expansion Net) -- Secure or nonsecure net to call for and adjust fire for units of TF___. Assignment of SFC SPOT net to the firing ship and SFC SPOT team will be made on JTF-82 by CTF___SACC.

JTF 89. Naval Fire Ground Spot (Expansion Net) -- Secure or nonsecure net to call for and adjust fire for units of TF___. Assignment of SFC SPOT net to the firing ship and SFC SPOT team will be made on JTF-82 by CTF___SACC.

JTF 90. Naval Fire Ground Spot (Expansion Net) -- Secure or nonsecure net to call for and adjust fire for units of TF___. Assignment of SFC SPOT net to the firing ship and SFC SPOT team will be made on JTF-82 by CTF___SACC.

JTF 91. Combined Forces Link-up Net -- Nonsecure VHF-FM voice net to coordinate rendezvous of separate elements or the rejoining of detached elements to parent organizations (multiple discrete frequencies).

JTF 93A. NF Airspot Control -- Secure or nonsecure UHF voice net used by airborne spotter to call and adjust fire. Assignment of this net to an air spotter will be made over the Tactical Air Observation Net. Assignment of this net to the firing ships will be made on JTF 83, Naval Fire Support. Only one fire mission at a time, per net, will be conducted.

JTF 93B. NF Airspot Control -- Secure or nonsecure UHF voice net used by airborne spotter to call and adjust fire. Assignment of this net to an air spotter will be made over the Tactical Air Observation Net. Assignment of this net to the firing ships will be made on JTF 83, Naval Fire Support. Only one fire mission at a time, per net, will be conducted.

JTF-XXX. JTF Net Expansion -- JTF expansion capability for additional net designators as determined by the applicable CINC or CJTF.

3. Air Coordination Nets.

AC 1. Joint Air Coordination Net -- Secure UHF voice net via tactical satellite linking military air control agencies for coordination of air operations within and adjacent to the objective area.

AC 1A. Joint Air Coordination Net -- Secure HF-SSB voice net backup to UHF Satellite net. Links military air control agencies for coordination of air operations within and adjacent to the objective area.

AC 2. Civil Air Control Common -- Nonsecure VHF-AM voice net

designated by FAA or Civil Air Route Traffic Control Center to be used by Air Force Air Traffic control functions at CTF _____ CRC/CRPs for control of civil aircraft movement in/through tactical airspace.

AC 3. Tactical Air Traffic Control Net -- Nonsecure UHF voice net guarded by air control agencies of Navy and Marine Tactical Air Control System (TACS) for initial report by tactical aircraft in support of CTF___ units. Also used by administrative and transient aircraft to establish contact with the applicable control agency. Circuit may also be used by Air Force Forces (AFFOR) elements for TACS/COMMON initial reporting net.

AC 3A. Tactical Air Traffic Control Net -- Nonsecure UHF voice net guarded by all Air Force radar facilities for initial reports by tactical aircraft in support of Air Forces (AFFOR) CRC/CRPs for control of civil aircraft movement in/through tactical airspace.

AC 4. Tactical Air Direction Net -- Secure UHF voice net provides for direction of aircraft in the conduct of a close air support (CAS) mission (multiple discrete frequencies).

AC 5. Fighter Air Direction/Combat Air Patrol/Air Defense Net -- Nonsecure UHF voice net supporting aircraft mission briefs and control of combat air patrol aircraft performing air defense alert, fighter escort, and/or threat intercept missions.

AC 8. Inflight Report -- Nonsecure UHF voice linking tactical air control systems and aircraft.

AC 9. UHF Airborne Relay -- Secure/Nonsecure UHF used to provide and extend point-to-point UHF voice communications between ground and surface elements.

AC 9A. UHF Airborne Relay -- Secure/Nonsecure UHF used to provide and extend point-to-point UHF DATA (LINK) communications between ground and surface elements.

AC 10. Joint Air Support Coordination Net -- Secure HF-SSB voice net used to coordinate immediate air support.

AC 10A. Joint Air Support Coordination Net -- Secure VHF-FM voice net to coordinate immediate air support.

AC 11. Link 11-- Secure HF netted TADIL A datalink.

AC 11A. Link 11-- Secure UHF netted TADIL A datalink.

AC 12. Link 14-- Secure HF-SSB receive-only broadcast providing air movement data.

AC 13. TADIL B-- Normally, a Secure/Nonsecure full duplex, HF, point-to-point link that operates with continuous transmissions in both directions, utilizing serial transmission frame characteristics.

AC 14. Interface Coordination Net (INC) -- Secure HF-SSB voice dual-function net (tactical weapon employment coordination/digital message and interface control).

AC 15. Track Supervision Net (TSN) -- Secure or nonsecure HF-SSB voice primary, assisting units entering/exiting the interface.

AC 15A. Track Supervision Net (TSN) -- Secure or nonsecure UHF voice backup, assisting units entering/exiting the interface.

AC 16. Datalink Coordination Net (DCN) -- Secure or nonsecure HF-SSB voice primary used to coordinate equipment supporting TADIL operations.

AC 16A. Datalink Coordination Net (DCN) -- Secure or nonsecure UHF voice backup used to coordinate equipment supporting TADIL operations.

AC 17. Voice Product Net (VPN) -- Secure UHF voice net used to forward

nondigital SIGINT information to other interface subscribers.

AC 17A. SIS/Voice Product Net (SIS/VPN) -- VINSON-Secure UHF voice net used to forward non-digital SI/SIGINT information to other interface subscribers.

AC 18. Tactical Air Request Net (TARN) -- Secure HF-SSB voice net used to request immediate air support from air control agencies.

AC 19. Fighter Check-In Net -- Secure or nonsecure UHF voice net used to direct joint fighter type aircraft missions.

AC 19A. Fighter Air Direction Net -- Nonsecure UHF voice net used to direct joint fighter type aircraft missions.

AC 20. Air Traffic Control -- Nonsecure UHF voice used for air traffic control services.

AC 20A. Air Traffic Control -- Nonsecure VHF-AM voice used for air traffic control services.

AC 23. Tanker/Refueling/Rendezvous Operations -- Nonsecure UHF or VHF-AM voice nets for control of rendezvous and tanker/tactical aircraft inflight refueling operations (multiple discrete frequencies).

AC 24. Helo Direction Net -- Nonsecure UHF voice net used to control helo assets in the JTF operating area.

AC 25. Helo Command Net -- Secure UHF voice net linking the Tactical Air Control Center (TACC) with the Naval helo support units.

ANNEX C to APPENDIX D

SAMPLE SPECTRUM MANAGEMENT APPENDIX

Following is a sample Appendix 4 to Annex K for JTF "X"s operations plan. This appendix could be constructed by either the CINC Joint Frequency Management Office (JFMO) or the JTF Spectrum Management Element (JSME) depending on the flow of the situation. Change JFMO/JSME to reflect issuing office as required.

APPENDIX 4 JOINT SPECTRUM MANAGEMENT TO ANNEX K COMMUNICATIONS TO "XXX"

1. (U) REFERENCES: a. Theater Spectrum Management Manual/Regulation/Instruction. (U)

b. CJCSI 3200.01, Electromagnetic Spectrum Use in Joint Military Operations (U)

c. CINC Directive 00-01, Joint Task Force Headquarters and Standing Operating Procedures (JTF HQ SOP). (U)

2. (U) GENERAL. This appendix provides guidance and direction for managing the spectrum to support operation JTF "X". In order to most efficiently manage the spectrum for the number of users within the AOR and make assignments to these forces, assignment authority will be centralized. The JFMO/JSME will coordinate all requests from the forces with the nation "X" and allies. Component spectrum managers will submit requests for frequencies, in Standard Frequency Action Format (SFAF), to the JFMO/JSME, and will be responsible for assignment and allotment of all spectrum assets once approved.

3. (U) CONCEPT OF SUPPORT.

a. (U) All Phases. Spectrum managers of the major components operating under JTF "X" will consolidate requests from subordinate units and forward these requirements to the JFMO/JSME.

b. (U) Automation. The automated system used for database management will be version 2.x of the Joint Spectrum Management System for Windows ($JSMS_W$). The JCEOI will be developed using version 2.x of Revised Battlefield Communications Electronic Operating Instructions (CEOI) System (RBECS) for Joint CEOI (JCEOI) generation. Transmission of frequency requests and assignments will be electronic mail; AUTODIN message, SIPRNET, FRRS account, PC-to-PC transfer or via diskette.

4. (U) RESPONSIBILITIES.

a. (U) JFMO/JSME:

1) (U) Establish JTF command policy on the use and management of the spectrum.

2) (U) In accordance with J5 guidance, coordinate spectrum use with the host-nation/allied spectrum management authorities.

3) (U) Serve as the senior frequency assignment coordination authority for subordinate task force units, and develop and distribute spectrum-use plans.

4) (U) Provide representation to the JCEWS.

5) (U) Combine inputs from all JTF staff levels and components and develop a proposed JRFL for J3 approval.

6) (U) Maintain and publish J3 approved JRFL.

7) (U) In conjunction with J6, and in coordination with the J3, develop, publish, promulgate, and maintain the JCEOI.

8) (U) Provide administrative and technical support for spectrum use.

9) (U) Maintain the common database for planning, coordinating, and controlling spectrum use.

10) (U) Implement JSIR procedures IAW CJCSI 3220.02.

11) (U) Evaluate, analyze, and attempt to resolve interference incidents at the lowest level possible. (See Tab A for JSIR report format).

b. (U) JTF J3

1) (U) Establish net structure for developing into the JCEOI. Provide inputs to the JFMO/JSME.

2) (U) Approve JRFL for publication and dissemination.

3) (U) Resolve spectrum-use conflicts between users IAW commander's priorities (e.g. J2 requirement to exploit vice J6 requirement to communicate).

4) (U) Provide frequency-input list to JCEWS for inclusion into the JRFL.

c. (U) JTF J2

1) (U) Provide GUARDED frequency list to JCEWS for inclusion into the JRFL.

2) (U) Assist in the resolution of interference incidents.

d. (U) Component Commands

1) (U) Submit spectrum requirements in SFAF format to JSME. Nominate specific frequencies to be coordinated with nation "X". If coordination with nation "X" is required, each proposal must contain a releasability code in SFAF item 005.

2) (U) Ensure users comply with their frequency assignment parameters (power, bandwidth, and location).

3) (U) Attempt to resolve any frequency conflicts and interference incidents locally. If resolution cannot be accomplished, report to JSME for resolution.

4) (U) Provide frequency list to JCEWS for inclusion into the JRFL.

e. (U) Deploying units

1) (U) Submit frequency requests in SFAF format through higher headquarters to JFMO/JSME.

2) (U) Ensure only those frequencies assigned are used and comply with parameters of the assignment, e.g. power, bandwidth, and location.

3) (U) Attempt to resolve any frequency conflict and interference incidents locally. If unable to resolve situation, report it IAW CJCSI 3220.02, Joint Spectrum Interference Resolution.

5. (U) FORMAT. All frequency requests submitted will comply with SFAF as prescribed in CINC Spectrum Management Manual. Preferably in electronic format; e-mail, autodin, or on floppy disk. Each frequency request must be a complete stand-alone record, not an abbreviated or parted proposal (e.g. part I of IV, part three same as part one except).

6. (U) SECURITY CLASSIFICATION.

a. (U) Frequency requests will be classified at the lowest level possible. If classified, each SFAF item will have a classification marking (U, C, or S) prior to the text.

b. (U) Any request, which requires submission through the host nation, will address releasability to host nation. For example; Confidential, Releasable to Host-Nation as Confidential.

TAB A: Electromagnetic Interference (EMI) Reporting

TAB B: JTF JCEOI Concept

TAB D: Spectrum Use Planning

TAB A ELECTROMAGNETIC INTERFERENCE (EMI) REPORTING TO APPENDIX 4 SPECTRUM MANAGEMENT TO ANNEX K COMMUNICATIONS TO "XXX"

1. (U) REFERENCES:

a. (U) Theater Spectrum Management Manual/Regulation/Instruction

b. (U) CJCSI 3320.02, Joint Spectrum Interference Resolution Program (S)

c. (U) CINC Directive 00-01, Joint Task Force Headquarters and Standing Operating Procedures (JTF HQ SOP).

2. (U) GENERAL. This Tab to Appendix 4 provides guidance and direction for reporting interference incidents encountered during Operation JTF "X".

3. (U) PROCEDURES:

a. (U) Interference incidents will be reported using the enclosed format. All reports of suspected hostile interference will be submitted via secure means.

b. (U) The operator/user experiencing the interference is responsible for submitting the interference report. All interference reports submitted during this JTF Operation will be coordinated through the Component C2W office before transmission

c. (U) Attempt to resolve interference problems at the lowest levels possible before submitting JSIR reports to higher headquarters

d. (U) Definitions:

1) (U) Meaconing. A system of receiving radio beacon signals and intentionally re-broadcasting them on the same frequency to confuse navigation.

2) (U) Intrusion. The intentional insertion of electromagnetic energy into transmission paths in any manner with the objective of deceiving operators or causing confusion.

3) (U) Jamming. The deliberate radiation, re-radiation or reflection of electromagnetic energy to disrupt use of electronic devices, equipment or systems.

4) (U) Unintentional disruptions are known as interference.

e. (U) Interference reports are submitted at a minimum to the following addresses depending on type of report:

For Hostile Interference:

ACTION: JSME
CINC JFMO
JC2WC SAN ANTONIO TX//OWS//
INFO: NSACSS FT GEORGE G MEADE MD//W9M//
DIA WASHINGTON DC//PGI-3A//
OTHER COMPONENT COMMANDS
THEATER CINC

Interference involving Space Systems:

ACTION: JSME
CINC JFMO
CMOC/SCC CHEYENNE MOUNTAIN AFS CO//SCC//
INFO: JSC ANNAPOLIS MD//OP/JSIR//
DISA ARLINGTON VA//DITF/UTTF// (Only for DSCS systems)
DISA WASHINGTON DC//333//
OTHER COMPONENT COMMANDS
THEATER CINC

Non-hostile Interference:

ACTION: CINC JFMO
JSME/
INFO: JSC ANNAPOLIS MD//OP/JSIR//
OTHER COMPONENT COMMANDS
THEATER CINC

f. (U) Reporting Format. To the maximum extent possible the JSIR generation capability in $JSMS_W$ will be used. If it is not available, then submit the following as minimum.

1) (U) Organization affected by EMI. Point of contact information (POC): Name and telephone number. Make sure when listing a POC that individual is familiar with the problem.

2) (U) Place name, latitude, and longitude where EMI occurred.

3) (U) Times, dates, periods EMI occurred. Indicate whether the duration of the interference is continuous or intermittent, the approximate repetition rate of interference, and whether the amplitude of the interference is varying or constant. Indicate if the interference is occurring at a regular or irregular time of day

4) (U) Systems and equipment affected by the EMI. Affected system function, name, nomenclature, manufacturer with model number or other system description.

5) (U) Allocated frequency band or authorized frequency of equipment affected.

6) (U) Station and/or equipment causing the interference and the location or call sign, if known.

7) (U) Allocated frequency band or authorized frequency of the station and/or equipment causing the interference, if known.

8) (U) Probable cause of interference (for example, co-channel assignment, harmonics, inter-modulation, spurious products, jamming, etc.).

9) (U) Extent of impairment to operational capability of affected equipment. Characteristics of interference (reduced range, false targets, reduced intelligibility, data errors, etc.)

10) (U) Corrective measures taken to resolve or work around the interference. .

11) (U) Effect of corrective measures.

12) (U) Any additional useful remarks. Provide a clear, unstructured narrative summary on the interference and local actions that have been take to resolve the problem.

TAB B JTF JCEOI CONCEPT TO APPENDIX 4 SPECTRUM MANAGEMENT TO ANNEX K COMMUNICATIONS TO JTF "X"

1. (U) References:

a. (U) Joint Chief Staff message DTG 182218Z OCT 93

b. (U) CJCSM 6230.04, Manual for Employing Revised Battlefield Electronic CEOI System (RBECS).

2. (U) Purpose. This tab provides information concerning the JCEOI concept and its use during JTF "X'".

3. (U) The RBECS version 2.X will be used during JTF "X" operations, along with RBECS Merge for Windows 2.X, to create, modify and generate the JCEOI.

4. (U) The JCEOI is a single, comprehensive document that contains frequencies, nets, SINCGARS information, and call signs/words for all participants. To provide adequate lead-time for submission of frequency requirements for allied coordination and to design, publish, and distribute the JCEOI, the following relationships and milestones are established:

a. (U) Submit all JCEOI data through component headquarters for consolidation and forwarding to the JTF "X" JSME for inclusion in JCEOI.

b. (U) Inputs are required from ARFOR, NAVFOR, AFFOR, MARFOR, JSOTF and Coalition Forces Component Headquarters.

5. (U) The desired input method for JTF JCEOI inputs are electronic RBECS format; however, as a minimum a paper copy of the Master Net List, Net Groups, Separation Plans are required. Coalition forces will submit and coordinate all requirements directly to the JSME for assistance in completing RBECS input.

6. (U) To create the JCEOI the following information is required:

a. (U) List of all radio nets:

1) (U) Identify radio nets, which have a specific title, e.g. Alternate (ALT), Anti-jam (AJ), or Conduct of Fire (COF). Radio net titles may contain a maximum of sixteen (16) characters including spaces, e.g., (29TH INF DIV ALT). Also identify the frequency band that radio net will operate in e.g., HF, VHF/FM, VHF/AM, UHF, SHF, or EHF.

2) (U) Identify radio nets requiring a fixed frequency.

3) (U) Identify nets that require frequency separation.

4) (U) Identify nets that can be included in a share plan.

5) (U) Satellite net names will appear in the JCEOI but may not have frequencies due to time constraints and availability of channels.

6) (U) HF DCS entry frequencies.

7) (U) Frequencies to be included in the JRFL must be identified prior to final generation of JCEOI.

8) (U) Nets requiring restriction codes and the restriction code definitions.

b. (U) List of all nets requiring a call sign to build the call sign vocabulary. Daily changing alphanumeric, tri-graph (letter-number letter) call signs will be used, e.g. B3K, C9Q, etc. The capability to provide fixed tri-graph call signs is not available.

c. (U) Identify all net groups to ensure their listing in your component layer of the JCEOI.

d. (U) Listing of units net names. These names can contain a maximum of sixteen (16) characters including spaces, (e.g. 9TH MAR TOW PLT). Net names cannot be used more than once within your component, net names must be unique.

e. (U) List of all nets requiring a call word in order to build the call word vocabulary include fixed and daily changing call words. The JSME will deconflict the call word dictionary against any fixed call words that are requested.

f. (U) List of the suffixes that each component will use. The suffix is a two-digit number attached to a call sign or call word used to identify personnel or staff sections within a unit. The suffix vocabulary may contain a maximum of 99 assignments. There will be one master changing suffix vocabulary for the JCEOI.

g. (U) List of expander titles that your unit will use. The expander is a single letter assignment used to further identify personnel within a unit. Expander vocabulary can contain a maximum of twenty (20) expander titles. There will be one master changing expander vocabulary for the JCEOI.

7. (U) Instructions for the use of changing suffixes/expanders are provided in the Quick Reference pages of the JCEOI.

8. (U) The JCEOI when completed will be transmitted electronically to all component commanders. Methods of transmission can include: SIPRNET e-mail, compressed file transfer over STU-III, or download from JTF "X" secure BBS. Coalition forces will be given paper copies.

9. (U) The JTF JCEOI will be in half-page 52-line format. The JCEOI will be generated in three (3) editions. One active edition, one reserve edition transmitted to, but not distributed below component headquarters, and a third edition to be used in case of a compromise.

TAB C JOINT SPECTRUM USE PLAN TO APPENDIX 4 SPECTRUM MANAGEMENT TO ANNEX K COMMUNICATIONSTO JTF "X"

1. (U) REFERENCES:

a. (U) Unified command regulation or Spectrum-Management Manual

b. (U) Unified command Joint Communications-Electronics Standing Instructions (JCESI)

c. (U) Other applicable directives or instructions, as appropriate

2. (U)PURPOSE. To describe spectrum-use plan for operation JTF "X"

3. (U)FREQUENCY PLAN. Subject to any limitations noted (such as power, bandwidth, hours of operation, etc.), list the frequencies authorized for use in the exercise/operation. Sort frequency authorizations according to frequency band to facilitate reference and use. The JCEOI frequency authorization information is also included in the JTF Frequency Plan. Present each sort list as a TAB to this appendix (Tab E & F). Use Table below as an example.

Freq. Band	Service Allocations used by military forces	Military Requirements	Conditions of Use
(a)	(b)	(c)	(d)
14-70 KHz	MARITIME MOBILE	Essential military requirement for naval communications.	
415 - 526.5 KHz	AERONAUTICAL RADIONAVIGATION	Military requirements for tactical non-directional beacons.	
	MARITIME MOBILE	Military requirements for naval communications	
156 – 174 MHz	MOBILE, except Aeronautical Mobile	Military requirements for Sonobuoy operations at sea and in port.	Sonobuoy to be operated on a secondary basis.
	MARITIME MOBILE	Military requirements for naval communications.	To be used in accordance with RR Appendix 18.
420 – 450 MHz	RADIOLOCATION Radiolocation	Military requirements for land and naval radar and airborne radar over ocean areas.	In the interference range of the territorial waters of member's countries, radar operations must be coordinated on a national basis according to the status of the services.
4400 – 5000MHz	FIXED, MOBILE	Essential military requirements for fixed, tactical radio relay and mobile systems.	1.This is a harmonized NATO band type1. 2.This FIXED SATELLITE service shall not be Implemented in NATO Europe.

ANNEX D TO APPENDIX D

CINC POINTS OF CONTACT AND AREA OF RESPONSIBILITY

1. The following table provides POC information for the CINC frequency management offices.

Table D-D-1. CINC Frequency Management Offices

COMMAND	TELEPHONE NO.	MESSAGE ADDRESS
US Central Command (USCENTCOM)	COMM (813) 828-6597 DSN 968-6597 FAX (UNCLAS info) DSN 968-6659 FAX (SECURE info) DSN 968-5279	USCINCENT MACDILL AFB FL//CCJ6-CO-F//
US European Command (USEUCOM)	COMM 49-711-680-8523 DSN (314) 430-8523 FAX (UNCLAS) DSN 314-430-5006 FAX(SECURE) Call for info	USCINCEUR VAIHINGEN GE//ECJ6-DF//
US Special Operations Command (USSOCOM)	COMM (813) 828-4855 DSN 968-4855 FAX (UNCLAS info) DSN 968-3279 FAX (SECURE) Call for number	USCINCSOC MACDILL AFB FL//SOJ6-PR//
US Atlantic Command (USACOM)	COMM (757) 444-3241 DSN 564-3241 FAX (UNCLAS) DSN 565-9267 FAX (SECURE info) DSN 836-5112	JFMO LANT NORFOLK VA//N54//
US Pacific Command (USPACOM)	COMM (808) 477-1051/2/4 DSN (STU III) (315) 477-1051/2/4 FAX (UNCLAS) (808) 477-0691 FAX (SECURE) (808) 477-1048	JFMO PAC HONOLULU HI//J61//
US Southern Command (USSOUTHCOM)	COMM (305) 437-XXXX DSN (312) 567-XXXX SIPRNET and NIPRNET (unchanged) SIPRNET: (userid)@hq.southcom.smil.mil NIPRNET: (userid)@southcom.mil JOIC: 3747; clas fax: 3743; unclas fax: 3742 SCJ6: 1601, 1402	USCINCSO MIAMI FL//SCJ6-0T//

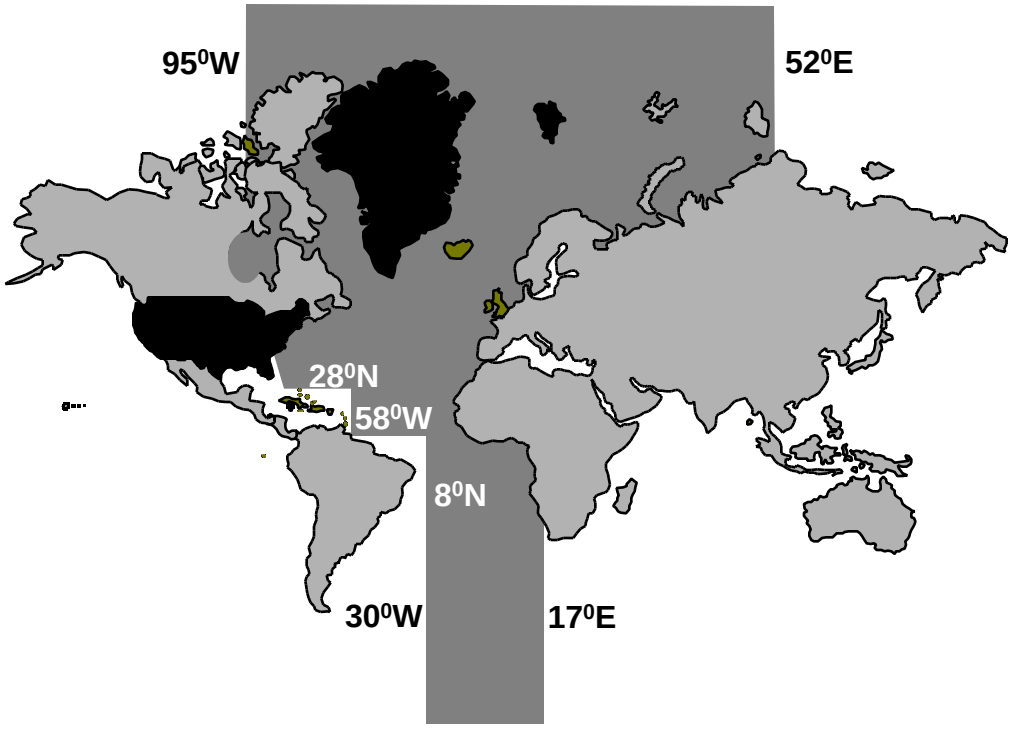


Figure D-D-1. USACOM Geographic Area of Responsibility.

Table D-D-2. USACOM county listing.

ITU CODE	COUNTRY
ASC	Ascension Island
AZR	Azores
GRL	Greenland
ISL	Iceland
MDR	Madeira
SHN	Saint Helena
SPM	Saint Pierre and Miquelon (French Department of)
STP	Sao Tome and Principe (Democratic Republic of)
USA	The 48 contiguous States of the United States of America
TRC	Tristan da Cunha

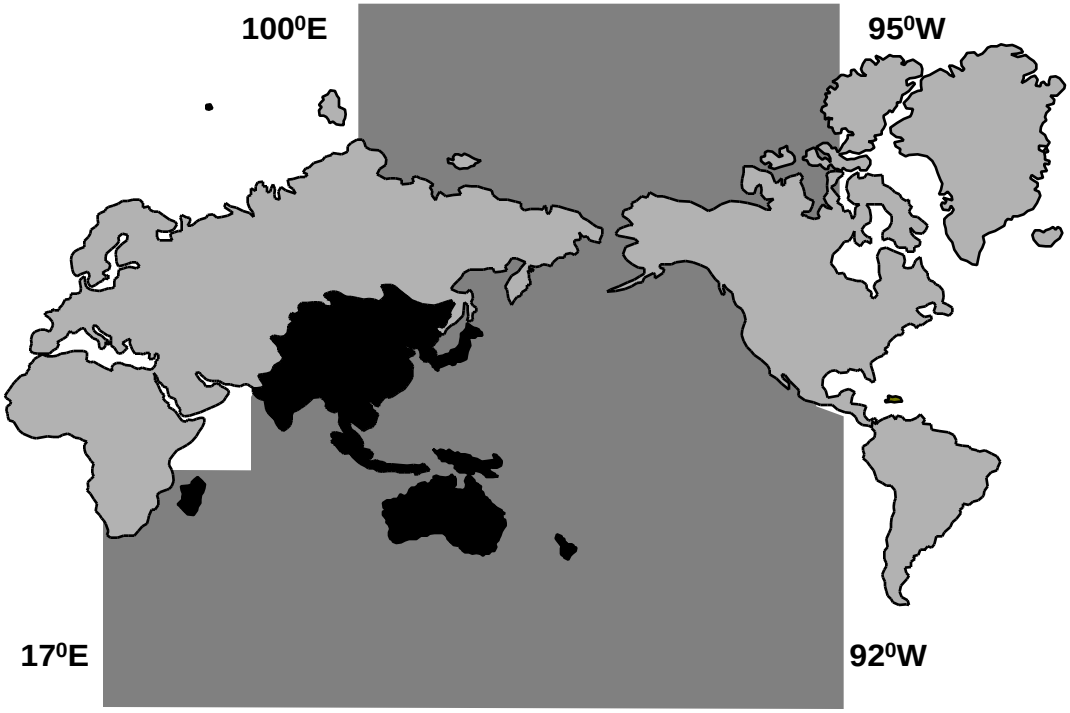


Figure D-D-2. USCINCPAC Geographic Area of Responsibility.

Table D-D-3. USCINCPAC Country Listing

ITU CODE	COUNTRY
ALS	Alaska
AUS	Australia
BGD	Bangladesh (People's Republic of)
ICO	Cocos Keeling Islands
COM	Comoros (Islamic Federal Republic of the)
CRO	Crozet Archipelago
DGA	Diego Garcia
FJI	Fiji (Republic of)
GUM	Guam
HWA	Hawaii
HKG	Hong Kong
IND	India (Republic of)
INS	Indonesia (Republic of)
J	Japan
JAR	Jarvis Island
JON	Johnston Island
FSM	Micronesia (Federated States of)
AMS	St Paul & Amsterdam Is. And Andorra (Principality of)
GCC	Territories of the United Kingdom in Region 3

Table D-D-3. Country list for USCINCPAC (continued)

ITU CODE	COUNTRY
KER	Kerguelen Islands
KIR	Kiribati (Republic of)
KOR	Korea (Republic of)
KRE	Korea, Democratic People's Republic of
LAO	Lao, People's Democratic Republic
MAC	Macao
MAU	Mauritius (Republic of)
MDG	Madagascar (Democratic Republic of)
MDW	Midway Islands
MHL	Marshall Islands (Republic of the)
MLA	Malaysia
MLD	Maldives (Republic of)
MRA	Mariana Islands (except Guam)
MRL	Marshall Islands
MRN	Marion Island
MSR	Montserrat
MYT	Mayotte Island
NCL	New Caledonia
NFK	Norfolk Island
NIU	Niue Island
NPL	Nepal
NRU	Nauru (Republic of)
NZL	New Zealand
OCE	French Polynesia
PAQ	Easter Island (Chile)
PHL	Philippines (Republic of the)
PHX	Phoenix Islands
PLM	Palmyra Island (some 50 islands make up the Atoll of Palmyra)
PLW	Palau (Republic of)
PNG	Papua New Guinea
PTC	Pitcairn Island
REU	Reunion (French Department of)
ROD	Rodriguez
SEY	Seychelles (Republic of)
SLM	Solomon Islands
SMA	American Samoa
SMO	Western Samoa (Independent State of)
SNG	Singapore (Republic of)
SWN	Swan Islands
TCA	Turks and Caicos Islands
THA	Thailand
TKL	Tokelau Islands
TMP	East Timor Columbia
TUV	Tuvalu
VTN	Viet Nam (Socialist Republic of)
VUT	Vanuatu (Republic of)
WAK	Wake Island
WAL	Wallis and Futuna Islands

Figure D-D-3. USCINCEUR Geographic Area of Responsibility.

Table D-D-4. USCINCEUR Country Listing.

ITU CODE	COUNTRY
ALB	Albania
ALG	Algeria (People's Democratic Republic of)
AGL	Angola (Republic of)
BEL	Belgium
BEN	Benin (Republic of)
BIH	Bosnia & Herzegovina (Republic of)
BOT	Botswana
BUL	Bulgaria
BFA	Burkina Faso
BDI	Burundi (Republic of)
CME	Cameroon (Republic of)
CAF	Central African Republic
TCD	Chad (Republic of)
TCD	Chad (Republic of)
COG	Congo (Republic of the)
CTI	Cote d'Ivoire (Republic of) (Ivory Coast)
HRV	Croatia (Republic of)
CZE	Czech Republic
DNK	Denmark DOM Dominican Republic
GNE	Equatorial Guinea (Republic of)
EST	Estonia (Republic of)
FIN	Finland
F	France
GAB	Gabonese Republic
GMB	Gambia (Republic of the)
D	Germany (Federal Republic of)

Table D-D-4. Country list for USCINCEUR (continued).

ITU	COUNTRY
GHA	Ghana
GRC	Greece
GUI	Guinea (Republic of)
GNB	Guinea-Bissau (Republic of)
HNG	Hungary (Republic of)
IRL	Ireland
ISR	Israel (State of)
I	Italy
LVA	Latvia (Republic of)
LBN	Lebanon
LSO	Lesotho (Kingdom of)
LBR	Liberia (Republic of)
LBY	Libya (Socialist People's Libyan Arab Jamahiriya)
LTU	Lithuania (Republic of)
LUX	Luxembourg
MWI	Malawi
MLI	Mali (Republic of) only)
MTN	Mauritania (Islamic Republic of)
MRC	Morocco (Kingdom of)
MOZ	Mozambique (Republic of)
NMB	Namibia (Republic of)
HOL	Netherlands (Kingdom of the)
NGR	Niger (Republic of the)
NIG	Nigeria (Federal Republic of)
NOR	Norway
POL	Poland (Republic of)
POR	Portugal
ROU	Romania
RRW	Rwandese Republic
SEN	Senegal (Republic of)
SEB	Serbia
SRL	Sierra Leone
SVK	Slovak Republic
SVN	Slovenia (Republic of)
AFS	South Africa (Republic of)
E	Spain
SWZ	Swaziland (Kingdom of)
S	Sweden
SUI	Switzerland (Confederation of)
SYR	Syrian Arab Republic
TZA	Tanzania (United Republic of)
ZAN	Tanzania (Zanzibar)
MKD	The Former Yugoslav Republic of Macedonia
TGO	Togolese Republic
TUN	Tunisia
TUR	Turkey
UGA	Uganda (Republic of)
G	United Kingdom of Great Britain and Northern Ireland
AOE	Western Sahara
ZAI	Zaire (Republic of)
ZMB	Zambia (Republic of)
ZWE	Zimbabwe (Republic of)

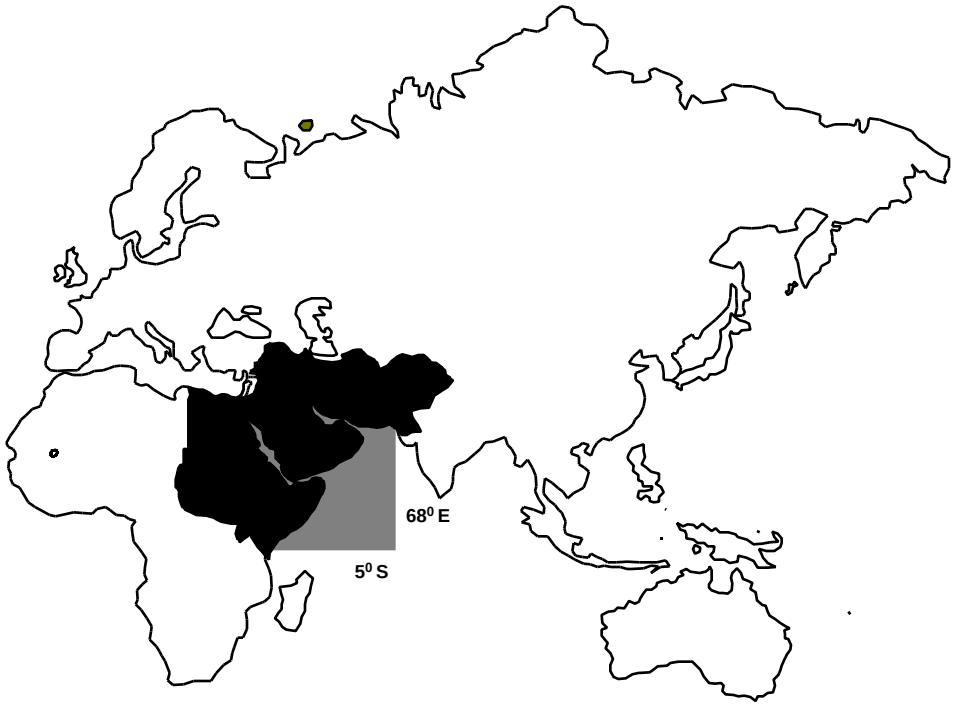


Figure D-D-4. USCINCCENT Geographic Area of Responsibility

Table D-D-5. USCINCCENT Country Listing.

ITU CODE	COUNTRY
AFG	Afghanistan
ARS	Saudi Arabia (Kingdom of)
BHR	Bahrain (State of)
DJI	Djibouti (Republic of)
EGY	Egypt (Arab Republic of)
ERI	Eritrea
ETH	Ethiopia
IRN	Iran (Islamic Republic of)
IRQ	Iraq (Republic of)
JOR	Jordan (Hashemite Kingdom of)
KEN	Kenya (Republic of)
KWT	Kuwait (State of)
OMA	Oman (Sultanate of)
PAK	Pakistan (Islamic Republic of)
QAT	Qatar
SDN	Sudan (Republic of the)
SOM	Somali Democratic Republic
UAE	United Arab Emirates

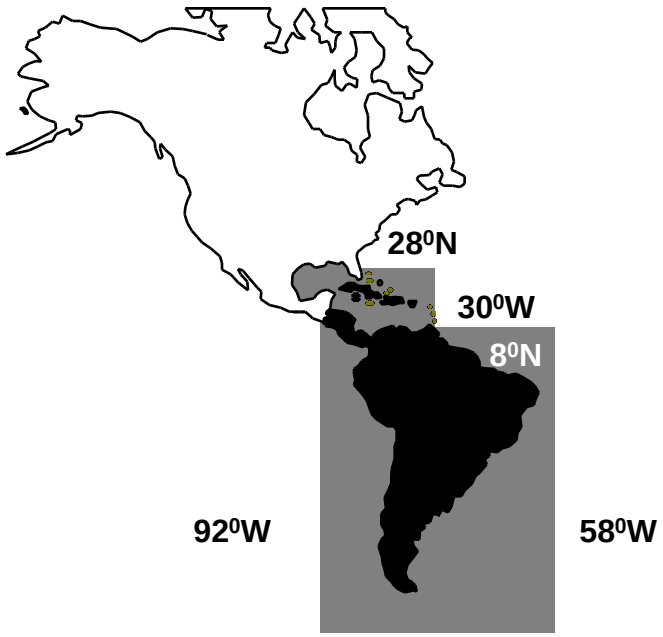


Table D-D-6. USCINCSO Country Listing.

ITU CODE	COUNTRY
ABW	Aruba
ARG	Argentine Republic
ATG	Antigua and Barbuda
B	Brazil (Federative Republic of)
BAH	Bahamas (Commonwealth of the)
BER	Bermuda
BLZ	Belize
CNR	Canary Islands
CTR	Costa Rica
CUB	Cuba
CYM	Cayman Islands
DMA	Dominica (Commonwealth of)
EQA	Ecuador
FLK	Falkland Islands (Malvinas)
GRD	Grenada
GDL	Guadeloupe (French Department Of)
GTM	Guatemala (Republic of)
GUF	Guiana (French Department of)
GUY	Guyana
HND	Honduras (Republic of)
HTI	Haiti (Republic of)

ITU CODE	COUNTRY
LCA	Saint Lucia
MRT	Martinique (French Department of)
NCG	Nicaragua
PNR	Panama (Republic of)
PRG	Paraguay (Republic of)
PRU	Peru
PTR	Puerto Rico (including Culebra, Mona, and Vieques)
SCN	Saint Christopher and Nevis
SLV	El Salvador (Republic of)
SUR	Suriname (Republic of)
TRD	Trinidad and Tobago
URG	Uruguay (Eastern Republic of)
VCT	St. Vincent and the Grenadines
VEN	Venezuela (Republic of)
VIR	United States Virgin Islands (St. Croix, St. John, St. Thomas)
VRG	British Virgin Islands

ANNEX E TO APPENDIX D

SAMPLE RBECS DATA CALL MESSAGE

1. The following is a sample AUTODIN data call message for JTF component force input into a JTF JCEOI.

FM JTF XRAY//J6//
TO AIG #####
BT
UNCLAS
EXER/JTF X//
MSGID/GENADMIN//
SUBJ/RBECS DATA CALL//
REF/A/CON/JTFX/970110//
RMKS/1. PER REF A, THE FOLLOWING PROCEDURES ARE PROVIDED TO STREAMLINE THE DEVELOPMENT OF THE JTF "X" UMBRELLA JCEOI.
REQUIRMENTS MUST BE SUBMITTED IN RBECS 2.x FORMAT IN RAW FORM. THE JCEOI WILL BE A SINGLE GENERATION JCEOI AND GENERATED BY THE JSME JTF "X" ON D-5. INPUT IS DUE NLT D-6.

A. MASTER NET LIST

(10 CIRCUITS

EXAMPLE:
JOINT CIRCUITS

NAME/DESCRIPTION	NET ID	C	O	RESTRICTIONS	FREQ	P	REUSE	CALLWORD
		S	C		W	CL	ZN	
JTF 19A	xxx	N	N	C	3	1	15	

NOTES: 1 – TYPE "XXX" IN NET ID IF CUE/MAN FREQS ARE REQUIRED FOR SINCGARS USE UNLESS PREDESIGNATED NET ID IS USED.

2 – THE NET NAME ALLOWS 16 CHARACTERS, ENSURE THAT NO DUPLICATES APPEAR IN YOUR COMPONENT MNL, TO AVOID JRFL CONFUSION.

3- ENTER "Y" IN CS COLUMN IF CALL SIGN REQUIRED.
ENTER "N" IN CS COLUMN IF NO CALL SIGN REQUIRED.

4- RESTRICTION CODES ARE AS FOLLOWS:
A – 2-6 MHz
B – 6-10 MHz
C – 10-18 MHz
D – 18-29 MHz
E – AREA RESTRICTION "BRAVO"
F – AREA RESTRICTION "GOLF"
G – P ARE USER DEFINEABLE RESTRICTIONS WHICH MUST BE IDENTIFIED TO THE JSME IN A SEPARATE DOCUMENT.

5- OC IS ORGANIZATION CODE. THE FOLLOWing OCS APPLY
JNT NETS OC # 1
ARFOR OC # 2
NAVFOR OC # 3
JSOTF & MARFOR OC # 4
AFFOR OC # 5
UN & COALITION OC # 6

6- PW IS THE POWER FIELD. CHANGE POWER LEVEL AS REQUIRED 1-VERY HIGH POWER, 2 – HIGH POWER, 3 – MEDIUM POWER, 4 – LOW POWER. DEFAULT IS 1.

7 – REUSE PLAN WILL BE AS REQUIRED. BE PREPARED TO IMPLEMENT COMPONENT REUSE PLAN AT A LATER TIME IF NECESSARY.

8 – CALLWORD FIELD ENTER A 5 OR 15 DESIGNATION UNLESS A FIXED CALLWORD IS DESIRED. IF SO, DECONFLICT WITH THE JTF "X" CALLWORD DICTIONARY ON THE JTF "X" BBS AS FILE CALL9705.05C AND CALL970315.15C. IF BUTTON NUMBER OR COLORWORD IN THIS FIELD PLEASE SPECIFY. ANY CALLWORDS THAT CONFLICT WILL BE REPLACED BY A RANDOMLY GENERATED CALLWORD. FIXED CALLWORDS WILL ONLY BE USED ON COVERED NETS.

2. COMPONENTS ARE REQUIRED TO SUPPLY ALL AIR ASSETS TO THE JSME ON A SEPARATE DOCUMENT FOR CALLWORD ASSIGNMENTS WHICH WILL BE INCLUDED IN THE ATO. THIS IS TO INCLUDE BUT NOT LIMITED TO ROTARY WING AIRCRAFT.
3. WHEN SUBMITTING RAW DATA ENSURE TO INCLUDE FREQUENCY SEPERATION PLANS, NET GROUPS, FREQUENCY AND CALLSIGN/CALLWORD SHARING PLANS.
4. SMOKE/PYROTECHNIC, SUFFIX/EXPANDER WILL BE GENERATED FROM THE RBECS PROGRAM.
5. ENSURE TO INCLUDE SUFFIX AND EXPANDER LISTS, THESE WILL BE STANDARD FOR THE ENTIRE TASK FORCE.
6. THE JSME WILL ASSIST UN AND COALITION FORCES WITH THE JCEOI DEVELOPMENT.
7. THE ACTIVE EDITION WILL BE AVAILABLE AT D-5 ON THE JTF BBS, COORDINATE FOR SPECIAL TRANSMISSION INSTRUCTIONS.
8. THE JSME WILL GENERATE 3 10 TIME PERIOD JCEOI'S. ONE ACTIVE FOR DISTRIBUTION TO THE TASK FORCE ON D-3. ONE RESERVE EDITION HELD BY THE JSME AND COMPONENT LEVEL J6'S. ONE ON THE SHELF COPY HELD BY THE JSME.

ANNEX F TO APPENDIX D

SAMPLE JTF FREQUENCY REQUEST MESSAGE

1. The following is a sample AUTODIN data call message to JTF component forces for SFAF requests for a JTF operation.

FM JTF XRAY//J6//
TO AIG #####
BT
UNCLAS
EXER/JTF X//
MSGID/GENADMIN//
SUBJ/JTF FREQUENCY REQUEST PROCEDURES//
REF/A/CON/JTFX/970110//
RMKS/1. PER REF A, THE FOLLOWING PROCEDURES PROVIDED TO ADEQUATELY SUPPLY THE JTF WITH NEEDED SPECTRUM REQUIREMENTS. INPUT IS DUE NLT D-30.
2. COMPONENT HQS WILL CONSOLIDATE AND FORWARD ALL FREQUENCY REQUESTS TO THE JSME. FREQUENCY REQUESTS MUST BE SUBMITTED IN ACCORDANCE WITH CINC SMM. ALL REQUESTS MUST CONTAIN THE FOLLOWING MANDATORY STANDARD ITEMS:

005. U (CLASSIFICATION)
010. N (TYPE OF ACTION)
102. JTFXNNNNNN (AGENCY SERIAL NUMBER)
JOINT REQUESTS 970001 TO 971000
ARFOR REQUESTS 971001 TO 972000
MARFOR REQUESTS 972001 TO 973000
AFFOR REQUESTS 973001 TO 974000
NAVFOR REQUEST 974001 TO 975000
JFACC REQUESTS 975001 TO 976000
104. JTFXJSME (ASSIGNMENT AUTHORITY)
110. M35.000 (FREQUENCY)
113. ML (STATION CLASS)
114. 3K00J3E (EMISSION DESIGNATOR)
115. W35 (TRANSMIT POWER)
140. 970701 (START DATE)
141. 979731 (STOP DATE)
144. O (RECORD INDICATOR)
200. JNTSVC (AGENCY)
201. CINC???? (UNIFIED COMMAND)
202. AFFOR / ARFOR / NAVFOR / MARFOR (UNIFIED COMMAND SERVICE).
JTF### JOINT NETS
CTF### ARFOR
CTF### MARFOR
CTF### NAVFOR
CTF### AFFOR
CTF### JSOTF
CTF### JFACC
CTF### UN/COALITION
204. COMMAND IS ARFOR, NAVFOR, MARFOR, AFFOR ETC. (COMMAND)
206. FREQ MGR
207. OPERATING UNIT (OPERATING UNIT)
300. XXX (TRANSMITTER LOCATION STANDARDIZED STATE/COUNTRY CODE)
301. XXXXXXX XXXXX (TRANSMITTER ANTENNA LOCATION))
303. 000000X/0000000X (TRANSMITTER LATITUDE/LONGITUDE)
340. G,AN/TRC-170 OR C,MOT1354 (TRANSMITTER EQUIPMENT NOMENCLATURE))

400. STATE /COUNTRY (RECEIVER ANTENNA LOCATION)
401. ANTENNA LOCATION (RECEIVER ANTENNA LOCATION)
403. 000000X0000000X (RECEIVER LATITUDE LONGITUDE)
440. G,AN/TRC-170 OR C,MOT1354 (RECEIVER EQUIPMENT NOMENCLATURE))
502. OPERATION XXXXX (DESCRIPTION OF REQUIREMENT)
702. LOCAL CONTROL NUMBER (CONTROL/REQUEST NUMBER)
910. OPERATION XXXXXXX XXXXXXX (EXERCISE / PROJECT)

2. THESE REQUIREMENTS WILL BE SUBMITTED ELECTRONICALLY IN SEPARATE VERTICAL SFAF RECORDS. NO PARTED, ABBREVIATED, OR ABC METHOD (E.G. PART 2 SAME AS PART ONE EXCEPT) MESSAGES WILL BE ACCEPTED.
3. ALL SATELLITE REQUESTS/ASSIGNMENTS MUST INFO JSME FOR ADDITION INTO THE EMB DATABASE.
4. THE ELECTROMAGNETIC ENVIRONMENT FOR AREA, “X” IS LOCATED ON THE SIPRNET AT 111.111.1111. IT IS A SPAWNED DATA FILE OR ON THE JTF “X” BBS NAMED “JTFEME.SPN”.

APPENDIX E

JOINT RESTRICTED FREQUENCY LIST

1. Introduction. The JRFL is a list that operational, intelligence and support elements used to identify the level of protection desired to various nets and frequencies. This list will be used to preclude these frequencies from being interfered with during EW missions. It will be limited to the minimum number of frequencies necessary for friendly forces to accomplish JTF objectives.

2. Definitions.

   a. Taboo. Any frequency of such importance that it must never be deliberately jammed or interfered with by friendly forces. This includes international distress, cease buzzer, safety and controller frequencies. Component operations and communications elements designate and update this list.

   b. Protected. Friendly forces operational frequency of critical importance that jamming should be restricted unless absolutely necessary or until it is coordinated. Component operations and communications elements designate and update this list.

   c. Guarded. Enemy frequencies currently being exploited for combat information and intelligence. This list is time-oriented in that the list changes as the enemy assumes different combat postures. These may be jammed if the Jamming Controlling Authority (JCA) determines the operational gain is greater than the information lost. The J-2 designates and updates this list.

3. JRFL Production Process. (figure E-1).

   a. Identification. The JRFL identification process begins at the unit level, and works upward through component Service chain-of-command channels. The JTF staff along with other forces will identify to the JSME those frequencies which will be included in the JRFL. Input to the JSME will be in the form of JCEOI nets, frequencies in the data base, and frequencies identified by the various elements of the J-2, J-3 and J-6. These frequencies will be identified to the JCEWS for coordination.

   b. Consolidation. These frequencies, along with any frequencies similarly identified by the component forces, are consolidated by the JSME into a JRFL. All generated JCEOIs for the JTF will be provided to the JSME. Included will be listing of International Taboo frequencies. The JSME will enter all inputs into JSMSw and generate an initial JRFL list.

   c. Review and Dissemination. This initial list is taken to the JCEWS for coordination and deconfliction. Once approval is received from the J-3 the JRFL is distributed, which is generally the responsibility of the J-6.

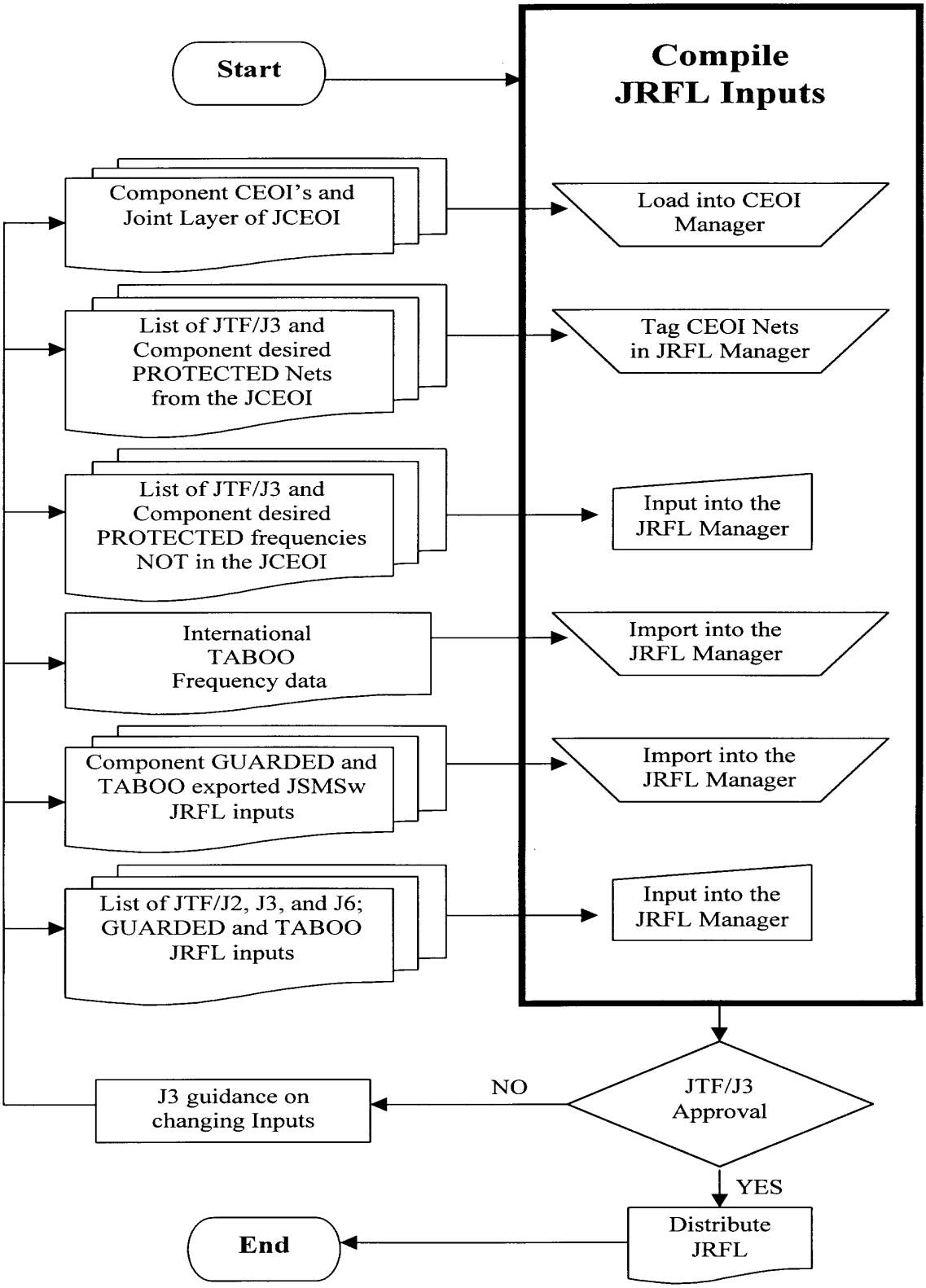


Figure E-1. The JRFL Process.

4. The following is a list of data fields that are needed to complete the JRFL report in $JSMS_{w.}$

d. Classification: One character indicates the security classification of the JRFL entry (U=UNCLASIFIED, C=CONFIDENTIAL, and S=SECRET).

e. Declassification: The declassification date for the frequencies to be protected.

f. Unit: Name of the unit to which the frequency is assigned.

g. Status: Restricted classification status (T=TABOO, G=GUARDED, and R=RESTRICTED) followed by a slash (/) and two characters to indicate the level of restriction, A-Z and 1-9, with A1 being the highest level.

h. Period: The time period for which the restriction will be active. This refers to the JCEOI time period.

i. Start Date: The date on which the restriction will begin.

j. End Date: The date on which the restriction will end.

k. Start Hour: The hour on which the restriction will begin.

l. End Hour: The hour on which the restriction will end.

m. Agency Serial: A unique agency identifier for each frequency assignment (SFAF Item 102).

n. Frequency: The frequency to be restricted.

o. Emission: The bandwidth and emission designator of the equipment (SFAF Item 114).

p. Power: The transmitter power preceded by the unit indicator (W=watts, K=kilowatts, M=megawatts, or G=gigawatts) (SFAF Item 115).

q. Tx Lat-Long: The latitude and longitude of the transmitter location in degrees, minutes, and seconds followed by N or S for the latitude and an E or W for the longitude.

r. Rx Lat-Long: The latitude and longitude of the receiver location in degrees, minutes, and seconds followed by N or S for the latitude and an E or W for the longitude.

s. Equipment: Enter the equipment name.

q. Comments: Enter all remarks, limitations, and comments.

Table E-1. Worldwide Restricted Frequency Listing.

Frequency	Use
K490	Meteorological Navigation Warnings
K500	Distress and Calling
K518	Meteorological Navigation Warnings
K2174.5	International Distress and Safety
K2182	International Distress
K2187.5	International Distress and Safety
K3023	International Search and Rescue
K4125	International Distress and Safety
K4177.5	International Distress and Safety
K4207.5	International Distress and Safety
K4209.5	Meteorological Navigation Warnings
K4210	International Maritime Navigation Warnings
K5680	International SAR
K6215	International Distress and Safety
K6268	International Distress and Safety
K6312	International Distress and Safety
K6314	INTL Maritime Safety
K8291	International Distress and Safety
K8364	International SAR/Survival Craft
K8376.5	International Distress and Safety
K8414.5	International Distress and Safety
K8416.5	International Maritime Safety
K10003	SAR Operations of Manned Space Vehicles
K12290	International Distress and Safety
K12520	International Distress and Safety
K12577	International Distress and Safety
K12579	International Navigation Safety
K14350	SAR Amateur Resolution 640
K14993	SAR Operations of Manned Space Vehicles
K16420	International Distress and Safety
K16695	International Distress and Safety
K16804.5	International Distress and Safety
K16806.5	International Maritime Safety
K18068	SAR Amateur Resolution 640
K19680.5	International Maritime Safety
K19993	SAR Operations of Manned Space Vehicles
K22376	International Maritime Safety
K26100.5	International Maritime Safety
M121.5	International Distress/Aeronautical Emergency
M123.1	International Emergency/SAR
M156.3	International Ship/Aircraft SAR
M156.525	International Distress/Safety/
M156.65	International Safety of Navigation
M156.8	International Distress and Safety
M243	Aeronautical Emergency/Intl Distress/SAR
M406	SATELLITE EPIRB
M406.1	Satellite EPIRB
M1645.5-M1646.5	Satellite S/E Distress and Safety

APPENDIX F

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b. ACP 190 US SUPP-2, "Coordination and Registration of Frequencies Used by Military Forces on Foreign Soil (C)," June 1990.
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f. DOD JSC HDBK-80-11-1, "Frequency Resource Record System (FRRS) Handbook Volume I," November 1996.
g. International Telecommunication Union Radio Regulations, 1990.
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i. Joint Pub 0-2, "Unified Action Armed Forces (UNAAF)," 24 February 1995.
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k. Joint Pub 1-02, "Department of Defense Dictionary of Military and Associated Terms," 23 March 1994.
l. Joint Pub 1-03, "Joint Reporting Structure (JRS) General Instructions," 10 January 1994.
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n. Joint Pub 3-51(S), "Electronic Warfare in Joint Military Operations," 30 June 1991.
o. Joint Pub 5-00.2, "Joint Task Force Planning Guidance and Procedures," 3 September 1991.
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q. Joint Pub 6-0, "Doctrine for Command, Control, Communications, and Computers (C4) Systems Support to Joint Operations," 30 May 1995.
r. Joint Pub 6-02, "Joint Doctrine for Employment of Operational/Tactical Command, Control, Communications, and Computer Systems," 1 October 1996.
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GLOSSARY

PART 1--ABBREVIATIONS AND ACRONYMS

AADC	Area Air Defense Commander
AC	Airspace Control
ACC	Air Combat Command (Air Force)
ACP	Allied Communications Publication
ADVON	Advanced Echelon
AFFOR	Air Force Forces
AFSAT	Armed forces satellite
AM	Amplitude Modulation
AMC	Army Materiel Command; Air Mobility Command (Air Force)
AO	Area of Operations
AOC	Air Operations Center
AOI	Area of Influence
AOR	Area of Operations
ARFOR	Army Forces
ATO	Air Tasking Order
AUTODIN	Automatic Digital Information Network
BEI	Background Environmental Information
C2	Command and Control
C2W	Command and Control Warfare
C3	Command, Control, and Communications
C4	Command, Control, Communications and Computers
C4I	Command, Control, Communications, Computers, and Intelligence
CAP	Crisis Action Planning
CAS	Close Air Support
CAT	Crisis Action Team
CCF	Central Computer Facility
C-E	Communications-Electronics
CEOI	Communications-Electronics Operation Instructions
CINC	Commander in Chief
CINCFOR	Commander in Chief, Forces Command
CJCS	Chairman of the Joint Chiefs of Staff
CJTF	Commander, Joint Task Force
COA	Course of Action
COCOM	Combatant Command (command authority)
COMARFOR	Commander, Army Forces
COMMARFOR	Commander, Marine Forces
COMUSFOR	Commander, U.S. Forces
CONOPS	Operations Plan in Concept Format
CONPLANS	Contingency Plans
CONUS	Continental United States
CPU	Central Processing Unit
CPX	Command Post Exercises
DCF	Distributed Computer Facility
DCS	Defense Communications System
DISA	Defense Information Systems Agency
DTD	Data Transfer Device
DTED	Digital Terrain Elevation Data
E3	Electromagnetic Environmental Effects
EMB	Electromagnetic Battlespace
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EOB	Electronic Order of Battle
EW	Electronic Warfare

EWO	Electronic Warfare Operations
FAX	Facsimile
FRRS	Frequency Resource Records System
FTX	Field Training Exercises
GB	Gigabyte
GMF	Government Master File; Ground Mobile Force
HQ	Headquarters
IFL	International Frequency List
IO	Information Operations
ITU	International Telecommunication Union
JC2WC	Joint Command and Control Warfare Center
JCCC	Joint Communications Control Center
JCEOI	Joint Communications-Electronics Operation Instructions
JCESI	Joint Communications-Electronics Standing Instructions
JCEWS	Joint Commanders Electronic Warfare Staff
JCS	Joint Chiefs of Staff
JCSE	Joint Communications Support Element
JFACC	Joint Forces Air Component Commander
JFC	Joint Force Commander
JFLCC	Joint Forces Landing Component Command
JFMCC	Joint Forces Maritime Component Command
JFMO	Joint Frequency Management Office
JOPES	Joint Operation Planning and Execution System
JRFL	Joint Restricted Frequency List
JSC	Joint Spectrum Center
JSIR	Joint Spectrum Interference Resolution
JSME	JTF Spectrum Management Element
$JSMS_w$	Joint Spectrum Management System for Windows
JSOTF	Joint Special Operations Task Force
JSPS	Joint Strategic Planning System
JTF	Joint Task Force
JULL	Joint Universal Lessons Learned
JWICS	Joint Worldwide Intelligence Communication System
MARFOR	Marine Corps Forces
MB	megabyte
MCEB	Military Communications-Electronics Board
MHz	Megahertz
MOOTW	Military Operations Other Than War
MSE	Mobile Subscriber Equipment
MUES	Management and Use of Electromagnetic Spectrum
NATO	North Atlantic Treaty Organization
NAVFOR	Navy Forces
NCA	National Command Authorities
NEO	Noncombatant Evacuation Operation
NIMA	National Imagery and Mapping Agency
NPT	Network Planning Terminal
NSA	National Security Agency
NTIA	National Telecommunications and Information Administration
OPCON	Operational Control
OPLAN	Operations Plan
OPORD	Operation Order
OPSEC	Operations Security
OUS&P	Outside United States and Possessions
PC	Personal Computer
PSYOP	Psychological Operations
RBECS	Revised Battlefield Electronic CEOI System
RF	Radio Frequency
SATCOM	Satellite Communications

SCIF	Special Compartmented Information Facility
SFAF	Standard Frequency Action Format
SIGINT	Signal Intelligence
SINCGARS	Single Channel Ground and Airborne Radio System
SOF	Special Operations Forces
SOFA	Status of Forces Agreement
SSB	Single Sideband
SSN	Sunspot Number
TACON	Tactical Control
TARN	Tactical Air Request Net
TF	Task Force
TRANSEC	Transmission Security
TSK	Transmission Security Key
TTY bdcst	Teletype Broadcast
UHF	Ultrahigh Frequency
UN	United Nations
US&P	United States and its Possessions
USACOM	United States Atlantic Command
USCINCCENT	Commander in Chief, United States Central Command
USCINCEUR	US Commander in Chief, Europe
USCINCPAC	Commander in Chief, United States Pacific Command
USCINCSOC	Commander in Chief, United States Special Operations Command
USCINCSOUTH	Commander in Chief, United States Southern Command
USCINCSPACE	Commander in Chief, United States Space Command
USCINCTRANS	Commander in Chief, United States Transportation Command
USMTF	United States Message Text Format
WOTL	Worldwide topographic loader

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GLOSSARY

PART II--DEFINITIONS

Alert Order (CJCS). A crisis action planning directive from the Secretary of Defense, issued by the Chairman of the Joint Chiefs of Staff, that provides essential guidance for planning and directs the initiation of execution planning following a decision by the NCA that U.S. military forces may be required to conduct military operations.

Allocation (of a frequency band). Entry in a table of frequency allocations of a given frequency band for the purpose of its use by one or more terrestrial or space radio communications services or the radio astronomy service under specified conditions. This term shall also be applied to the frequency band concerned (from ITU RR).

Area of Influence (AOI). The electromagnetic environment, surrounding the AOR where a potential for electromagnetic interaction exits.

Area of Responsibility (AOR). That portion of an area of war necessary for military operations and for the administration of such operations (Joint Pub 1-02).

Assignment. (of a radio frequency or radio frequency channel) Authorization given by an authority for a radio station to use a radio frequency or radio frequency channel under specific conditions (from ITU RR).

Background Environmental Information (BEI). The combination of civilian electromagnetic communications infrastructure and the natural phenomena within an AOR.

Channeling Plan. The plan by which frequencies within a band are to be assigned.

Combatant Command. One of the unified or specified commands established by the President (Joint Pub 1).

Combatant Command (command authority). Nontransferable command authority established by title 10 United States Code, section 164, exercised only by commanders of unified or specified combatant commands. Combatant Command (command authority) is the authority of a combatant commander to perform those functions of command over assigned forces, involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction over all aspects of military operations, joint training, and logistics necessary to accomplish the missions assigned to the command. Combatant Command (command authority) should be exercised through the commanders of subordinate organizations; normally this authority is exercised through the Service component commander. Combatant Command (command authority) provides full authority to organize and employ commands and forces that the CINC considers necessary to accomplish assigned missions. Also called COCOM (Joint Pub 1-02).

Combatant Commander. A commander in chief of one of the unified or specified commands established by the President. (Joint Pub 1-02)

Command And Control Warfare. The integrated use of operations security (OPSEC), military deception, psychological operations (PSYOP), electronic warfare (EW), and physical destruction, mutually supported by intelligence, to deny information to, influence, degrade, or destroy adversary command and control capabilities, while protecting friendly command and control capabilities against such actions. Also called C2W. C2W applies across the operational continuum and all levels of conflict. C2W is both offensive and defensive:

a. counter-C2. To prevent effective C2 of adversary forces by denying information to, influencing, degrading or destroying the adversary C2 system. (Joint Pub 1-02)

b. C2-protection. To maintain effective command and control of own forces by turning to friendly advantage or negating adversary efforts to deny information to, influence, degrade or destroy the friendly C2 system. (Joint Pub 1-02)

Contingency Planning. The development of plans for potential crises involving military requirements that can reasonably be expected in an area of responsibility. Contingency planning is normally conducted during peacetime, but may be performed under crisis action conditions. Contingency planning for joint operations is coordinated at the national level by assigning planning tasks and relationships among the combatant commanders and apportioning or allocating to them the forces and resources available to accomplish those tasks. Commanders throughout the unified chain of command may task their staffs and subordinate commands with additional contingency planning tasks beyond those specified at the national level to provide broader contingency coverage.

Crisis. An incident or situation involving a threat to the United States, its territories, citizens, military forces, or vital interests, that develops rapidly and that creates a condition of such diplomatic, economic, political, or military importance that commitment of U.S. military forces and resources is contemplated to achieve national objectives.

Crisis Action Planning (CAP). The JOPES process involves the time-sensitive development of joint operation plans and orders in response to an imminent crisis. Crisis action planning follows prescribed procedures to formulate and implement an effective response within the timeframe permitted by the crisis.

Deconfliction. A systematic management procedure to coordinate the use of the electromagnetic spectrum for operations, communications, and intelligence functions. It is an element of electromagnetic spectrum management.

Deliberate Planning. The JOPES process involving the development of joint operation plans for contingencies identified in joint strategic planning documents. Conducted principally in peacetime, deliberate planning is accomplished in prescribed cycles that complement other DOD planning cycles and in accordance with formally established Joint Strategic Planning System (JSPS) procedures.

Deployment Database. The joint deployment database contains the necessary information on forces, materiel, and filler and replacement personnel movement requirements to support execution. The database reflects information contained in the refined time-phased force and deployment data, or data developed during the various phases of the crisis action system, and the movement schedules or tables developed by the transportation operating agencies to support the deployment of required forces, personnel, and materiel. (JCS Pub 1-02)

Deployment Planning. Encompasses all planning activities from origin or home station through destination, specifically including intra-CONUS, inter-theater, and intra-theater movement legs, staging areas, and holding areas.

Electromagnetic Battlespace (EMB). The electromagnetic battlespace includes: background environmental information (BEI); the hostile (red), friendly (blue), UN, host nation, and coalition (gray) forces electromagnetic order of battle (EOB), within the JFC's AOR and area of influence (AOI).

Electromagnetic Compatibility (EMC). The capability of electrical and electronic systems, equipment, and devices to operate in their intended electromagnetic environment within a defined margin of safety, and at design levels of performance without suffering or causing unacceptable degradation as a result of electromagnetic interference.

Electromagnetic Environment (EMC). The electromagnetic field(s) and or signals existing in a transmission medium. The (time-variant) totality of EM phenomena that exists at a given location.

Electromagnetic Environmental Effects (E3). The impact of the electromagnetic environment upon the operational capability of military forces, equipment, systems, and platforms. Frequently referred to as E3.

Electromagnetic Interference (EMI). Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment. It can be induced intentionally, as in some forms of electronic warfare, or unintentionally, because of spurious emissions and responses, intermodulation products, etc. (JCS Pub 1-02)

Electronic Attack (EA). The division of EW involving the use of electromagnetic or directed energy to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability. It includes: (1) actions taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum such as jamming and electromagnetic deception and (2) employment of weapons that use either electromagnetic or directed energy as their primary destructive mechanism (lasers, RF weapons, particle beams).

Electronic Warfare (EW). Any military action involving the use of electromagnetic energy and directed energy to control the electromagnetic spectrum or to attack the enemy (EW). The three major subdivisions within electronic warfare are:

a. Electronic attack (EA)

b. Electronic protection (EP)

c. Electronic warfare support (ES)

Employment Planning. The strategic, operational, or tactical use of forces and material in an area or theater of operations.

Essential Elements of Friendly Information (EEFI). Critical items of information regarding the enemy and the environment needed by the commander by a particular time to relate with other available information and intelligence in order to assist in reaching a logical decision.

Execution Planning. The phase of the Joint Operation Planning and Execution System crisis action planning process that provides for the translation of an approved course of action into an executable plan of action through the preparation of a detailed planning document for the commitment of specified forces and resources. During crisis action planning, an approved operation plan or other NCA-approved course of action is adjusted, refined, and translated into an operation order. Execution planning can proceed based on prior deliberate planning, or it can take place in the absence of prior planning.

Force Module(s). A grouping of combat, combat support, and combat service support forces, with or without appropriate non-unit-related personnel and supplies. The elements of force modules are linked together or uniquely identified so they can be extracted from or adjusted as an entity in the planning and execution databases to enhance flexibility and usefulness of the operation plan during a crisis.

14 Point Format. The U.S. European and Central Command's frequency action message format, for frequency assignments.

Guarded Frequency (ies). Enemy frequencies that are currently being exploited for combat information and intelligence. A guarded frequency is time-oriented in that the list changes as the enemy assumes different combat postures.

Host Nation Support. Civil and/or military assistance rendered by a nation to foreign forces within its territory during peacetime, times of crisis/emergencies, or war based upon agreements mutually concluded between nations. (Joint Pub 1-02)

Joint Force Commander. A general term applied to a commander authorized to exercise Combatant Command (command authority) or operational control over a joint force. Also called JFC.

Joint Operation Planning. Joint operation planning activities exclusively associated with the preparation of OPLANs, CONPLANs, and OPORDs (other than the SIOP) for the conduct of military operations in hostile environments by the Combatant Commanders in response to requirements established by the Chairman of the Joint Chiefs of Staff. As such, joint operation planning includes contingency planning, execution planning, and implementation planning. Joint operation planning is performed in accordance with formally established planning and execution procedures.

Joint Operation Planning and Execution System. Also called JOPES. A continuously evolving system that is being developed through the integration and enhancement of earlier planning and execution systems: JOPS, and JDS. It provides the foundation for conventional command and control by national- and theater-level commanders and their staffs. It is designed to satisfy their information needs when conducting joint planning and operations. JOPES includes joint operations planning policies, procedures, and reporting structures supported by communications and automated data processing systems. JOPES, used to monitor, plan, and execute mobilization, deployment, employment, and sustainment activities associated with joint operations.

Joint Restricted Frequency List. A list of PROTECTED, GUARDED, or TABOO frequencies promulgated by a CINC or JTF commander in order to protect critical friendly frequencies or nets from friendly EW. Also called JRFL.

Joint Special Operations Task Force (JSOTF). A joint task force composed of special operations units from more than one Service and formed to carry out a specific special operation or prosecute special operations in support of a theater campaign or other operations. The joint special operations task force may have conventional non-special operations units assigned or attached to support the conduct of specific missions.

Joint Task Force (JTF). A force composed of assigned or attached elements of the Army, the Navy, or the Marine Corps, and the Air Force, or two or more of these Services, which is constituted and so designated by the Secretary of Defense or by the commander of a unified command, a specified command, or an existing joint task force. (JCS Pub 1-02).

Operational Control (OPCON). Transferable command authority which may be exercised by commanders at any echelon at or below the level of combatant command (OPCON). Operational control is inherent in Combatant Command (command authority) and is the authority to perform those functions of command over subordinate forces involving organizing, and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction to accomplish the mission.

Protected Frequency (ies). Friendly frequencies used for a particular operation, identified and protected to prevent inadvertent jamming while active EW operations are directed against hostile forces. These frequencies are of such critical importance that jamming should be restricted unless necessary or after coordination with the user.

Redeployment. The transfer of a unit, an individual, or supplies deployed in one area to another area, or location within the area, or to the zone of interior for the purpose of further employment. (Joint Pub 1-02)

Service Component Command. A command consisting of the Service component commander and all those individuals, units, detachments, organizations, and installations under the command that have been assigned to the unified command. (Joint Pub 1)

Specified Command. A command that has a broad continuing mission and that is established and so designated by the President through the Secretary of Defense with the advice and assistance of the Chairman of the Joint Chiefs of Staff. It normally is composed of forces from but one Service. (Joint Pub 1)

Spectrum Management. The process of maximizing the efficient use of the electromagnetic spectrum through operational, engineering, and administrative procedures to allow electronic systems to perform their functions in their intended environment without causing or receiving unacceptable levels of interference.

Subordinate Commander. A commander under the COCOM or OPCON of either a supported or supporting commander, normally this is a Service component commander or the commander of a subordinate unified command or subordinate joint task force.

Supported Commander. The commander having primary responsibility for all aspects of a task assigned by the Joint Strategic Capabilities Plan (JSCP) or other joint operation planning authority. In the context of joint operation planning, this term refers to the commander who prepares operation plans or orders in response to requirements of the Chairman of the Joint Chiefs of Staff.

Taboo Frequency (ies). Any friendly frequency of such importance that it must never be deliberately jammed or interfered with by friendly forces. Normally these frequencies include international distress, stop buzzer, safety and controller frequencies. These frequencies are generally longstanding. However, they may be time-oriented in that, as the combat or exercise situation changes, the restriction may be removed.

Time-Phased Force and Deployment Data (TPFDD). The computer supported data base portion of an operation plan; it contains time-phased force data, non-unit-related cargo and personnel data, and movement data from the operation plan, including:

1. In-place units.

2. Units to be deployed to support the operation plan with a priority indicating the desired sequence for their arrival at the port of debarkation.

3. Routing of forces to be deployed.

4. Movement data associated with deploying forces.

5. Estimates of non-unit-related cargo and personnel movements to be conducted concurrently with the deployment of forces.

6. Estimate of transportation requirements that must be fulfilled by common-user lift resources concurrently with the deployment of forces.

7. Estimate of transportation requirements that must be fulfilled by common-user lift resources as well as those requirements that can be fulfilled by assigned or attached transportation resources.

Time-Phased Force and Deployment List (TPFDL). Identifies types and/or actual units required to support the operation plan and indicated origin and ports of debarkation or ocean area. It may also be generated as a computer listing from the time-phased force and deployment data.

Unified Command. A command with a broad and continuing mission under a single commander and composed of significant assigned components of two or more Services and which is established and so designated by the President, through the Secretary of Defense, with the advice and assistance of the Chairman of the Joint Chiefs of Staff, or, when so authorized by a commander of an existing unified command established by the President. (Joint Pub 1-02)

Warning Order (CJCS). A crisis action planning directive issued by the Chairman of the Joint Chiefs of Staff that initiates the development and evaluation of courses of action by a supported commander and that requests that a commander's estimate be submitted.

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