



CHAIRMAN OF THE JOINT CHIEFS OF STAFF INSTRUCTION

J-6

DISTRIBUTION: A, B, C, J, S

CJCSI 3320.01A

30 September 2002

ELECTROMAGNETIC SPECTRUM USE IN JOINT MILITARY OPERATIONS

References: See Enclosure B

1. **Purpose.** In accordance with Enclosure B, reference a, issue policy and guidance for planning, coordinating, and controlling electromagnetic spectrum use in joint military operations. To develop and implement joint doctrinal concepts and associated operational procedures to achieve interoperability of IT and NSS capabilities employed by US military forces and, where required, with joint, combined, and coalition forces and other USG departments and agencies. References a through o are provided for further reading.

2. **Cancellation.** CJCSI 3320.01, 1 May 2000, is canceled.

3. **Applicability.** This instruction applies to the Joint Staff, Services, unified commands, US elements of combined commands, Defense agencies, and joint activities.

4. **Policy.** Assured access to the electromagnetic spectrum is vital to DOD operations worldwide. This publication identifies basic considerations for operating spectrum-dependent systems in a joint military and civil environment.

a. **Joint Spectrum Environment.** Military operations rely heavily on equipment using the limited resources of the electromagnetic spectrum. In joint military operations, requirements may exceed the amount of spectrum available. As a result, efficient use and control of the spectrum is critical to national security in terms of IO, combat operations, and C2W. Effective spectrum management (the organized control and use of the electromagnetic spectrum) is fundamentally essential to sound defensive IO and C2 protection, which ensures operations can be conducted with minimal unintentional

interference and without negative E3. The rapid growth of sophisticated weapons systems, as well as intelligence, operations, and communications systems, greatly increases demand for frequencies. Lack of proper, preplanned frequency coordination will have an adverse effect upon friendly but competing users. Spectrum availability is further constrained by national legislation designed to carefully protect the rights of sovereign governments by requiring approval prior to transmission in any portion of the spectrum that lies within a particular country's national borders. Joint and combined force operations must also consider the needs of coalition forces in future contingencies. Therefore, an effective spectrum management structure is required not only to satisfy spectrum needs of military users, but also to coordinate with host nations to facilitate effective use of this finite resource. Further spectrum issues are discussed within the Enclosure B references.

b. Electromagnetic Spectrum Planning, Coordination, and Control. To use the spectrum successfully, all users must work together by exchanging vital spectrum information from the beginning of the joint planning process through execution of any operation via Spectrum XXI architecture. Primarily, personnel assigned to operations directorate of a joint staff (J-3), intelligence directorate of a joint staff (J-2), and communications directorate of a joint staff (J-6) functional areas plan, coordinate, and control joint military use of the electromagnetic spectrum. To minimize unacceptable EMI among all emitters and receivers and to address E3 issues in joint operations, these three functional areas must work together. Additionally, automated spectrum management systems at the joint and component levels require vertical and horizontal interoperability.

c. Concept of Control. The supported JFC or CJTF holds the authority for assigning frequencies to users, usually through the Joint Frequency Management Office or Joint Spectrum Management Element. The JFMO or JSME may on occasion delegate frequency assignment authority to subordinate commands, decentralizing the management of the electromagnetic battlespace. Authority to assign use of a specific spectrum resource (utilization of allotment plans developed by the JFMO or JSME) should be delegated to the lowest level of command possible, consistent with the principles of sound spectrum management, spectrum use considerations, concept of operations, and priority of mission functions detailed in the respective Service or joint publications. Subordinate commands delegated authority for approving spectrum use will make frequency assignments within the constraints imposed by higher authorities and report changes in spectrum assignment information to the JFMO or JSME.

d. Spectrum Assignment Conflicts. To ensure critical frequencies and spectrum-dependent systems are protected from unintentional interference because of friendly operations, the J-6 coordinates, publishes, distributes, and

maintains a Joint Restricted Frequency List 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 accomplished within the 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 by CJTF, JFC or JFMO. For conflicting or competing use that affects more than one primary functional area, the IO Cell examines requirements and attempts to resolve coordination issues with JFMO or JSME. If resolution is impossible at this level, the matter is elevated to JFC or designee, who is usually the JFMO or JSME.

e. Joint Spectrum Assignment Planning. Planning for use of the spectrum resource and assigning of spectrum management responsibilities must be fully integrated into the JOPES process. The complexity of effective joint spectrum use and management requires advance planning for scenarios of expected military operations. Each joint and subordinate component command must establish planning procedures to address all spectrum-dependent systems used in support of an OPLAN and any other requirements of friendly forces that impact the use of the electromagnetic spectrum. Spectrum managers must be fully integrated into the planning process at the initial and subsequent planning stages. Additionally, planning must be done in a consistent manner with each joint command. Without advance spectrum-use planning, EMI among users and/or a shortage of assigned frequencies may become a severe limitation to rapid deployment and employment of forces.

5. Definitions. See Glossary.

6. Responsibilities. See Enclosure A.

7. Summary of Changes. Updates were administrative, the contents of the instruction was not substantially changed. This change:

a. Replaces all references to the term CINC with combatant commander.

b. Updates the Glossary according to Joint Publication 1-02, 1 April 2001, "Department of Defense Dictionary of Military and Associated Terms."

c. Modifies and correct all references.

8. Releasability. This instruction is approved for public release; distribution is unlimited. DOD components (to include the combatant commands), other federal agencies, and the public may obtain copies of this instruction through the Internet from the CJCS Directives Home Page -- <http://www.dtic.mil/doctrine/jel/jel.htm>. Copies are also available through the Government Printing Office on the Joint Electronic Library CD-ROM.

9. Effective Date. This instruction is effective upon receipt.

For the Chairman of the Joint Chiefs of Staff:

A handwritten signature in black ink, reading "John P. Abizaid". The signature is written in a cursive style with a large, sweeping initial "J".

JOHN P. ABIZAID
Lieutenant General, USA
Director, Joint Staff

Enclosures:

- A -- Responsibilities**
- B -- References**
- GL -- Glossary**

DISTRIBUTION

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ENCLOSURE A
RESPONSIBILITIES

1. Chairman of the Joint Chiefs of Staff will:

a. Provide policy oversight on development of a joint standard for exchange of spectrum assignment data.

b. Identify, assess, and recommend measures to ensure that electromagnetic spectrum use is mutually supporting and effective in joint and combined operations.

2. Combatant commander(s) with geographic AORs will:

a. Establish command-specific policy and guidance for electromagnetic spectrum use that uniquely apply to their area.

b. Establish a standing frequency management structure, to include a JFMO or JSME, and procedures to support planned and ongoing operations. Specific actions will be taken to:

(1) Ensure OPLANS and COMPLANs address coordination among forces using the electromagnetic spectrum to enable effective exchange of information, eliminate duplication of effort, and achieve mutual support.

(2) Ensure plans address any necessary augmentation of the JFMO or JSME to support the spectrum management effort.

(3) Resolve user conflicts not resolved at a lower level.

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

c. Function as controlling authority for the joint communications-electronics operation instructions.

3. Combatant commander, J-6, (JFMO or JSME by delegation) will:

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

- b. Participate in the IO Cell. Prepare the JRFL input for spectrum dependent systems. Combine J-2, J-3, and J-6 inputs to develop a proposed JRFL for approval by the combatant commander, 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 frequency database necessary for planning, coordinating, and controlling spectrum use. This database contains spectrum assignment information on all friendly, combined and coalition-military and civilian, available enemy, and neutral emitters and receivers appropriate for the AOR involved.**
- g. Analyze and evaluate potential spectrum assignment conflicts.**
- h. Assist and coordinate the resolution of spectrum assignment conflicts as a member of the IO Cell.**
- i. In accordance with combatant commander, J-5, guidance, coordinate military spectrum use with the spectrum authority of the host nation(s) involved, in coordination with the US Embassy DATT OMC, Friendly Forces Coordination Cell, etc., when appropriate.**
- j. Be the focal point for inclusion of spectrum use considerations in the Annex K of the OPLAN.**
- k. Receive reports, analyze, attempt to resolve incidents of unacceptable EMI, act as the focal point for requesting interference resolution support from the JSC, and provide guidance for resolving radio frequency interference problems at the lowest level in the chain of command in accordance with Enclosure B, reference k. Report all EMI incidents that cannot be resolved to the JSC for resolution as described in Enclosure B, reference k, paragraph 4, "All electronic after attack and problems, recurring radio frequency interference problems will be reported to the JSC in a timely manner to support resolution of interference problems, trend analysis, development of lessons learned, and inputs to the DOD Indications and Warning System."**
- l. Participate in the joint IO Cell to ensure that the spectrum architecture supports the Joint Staff's IO plans and that the use of the spectrum is coordinated among the IO elements.**
- m. Support operations as a member of the IO Cell.**

4. Combatant commander, J-3, will:

- a. Establish the IO Cell IAW Enclosure B, reference p, and C2W Cell IAW Enclosure B, reference o.**
- b. Provide spectrum assignment considerations to combatant commander, J-6, for inclusion in the Annex K of the OPLAN.**
- c. Resolve internal spectrum assignment conflicts (J-3 systems) that the JFMO or IO Cell are unable to resolve. When designated by the commander, resolve coordination issues that can not be done by the JFMO.**
- d. Provide the concept of operations.**
- e. Establish the priority of mission functions.**
- f. Identify and resolve potential E3 hazards to ordnance. Act as the focal point for requesting ordnance assist team support from the JSC.**
- g. Provide and validate JRFL inputs, approve consolidated JRFL.**

5. Combatant commander, J-2, will:

- a. Participate in the IO Cell and assess and provide combatant commander, J-6, with prioritized spectrum assignment requirements that support intelligence operations.**
- b. Resolve internal spectrum assignment conflicts (J-2 systems).**
- c. Participate in multifunctional user spectrum assignment conflict resolution.**
- d. Provide JRFL input to JFMO.**
- e. Provide and give access to, in coordination with the Director, National Security Agency, and the national SIGINT authority, actual enemy spectrum use data, in accordance with data release constraints.**
- f. Include spectrum use considerations in the Annex K of the OPLAN.**
- g. Assist the combatant commander, J-6, in determining the sources of any unacceptable EMI or other persistent and recurring interference.**

6. Combatant commander, J-5, will establish channels for the negotiation of military use of the spectrum with any nation involved in a joint or combined military operation, or within whose territory US forces may be operating where procedures do not already exist.

7. Commander, CJTF, will:

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

b. Work with the combatant commander staff if modifications are necessary for a specific electromagnetic spectrum use situation.

c. For operations outside a combatant commander AOR, assume the responsibilities listed for the combatant commander in paragraph 2 of this enclosure.

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

e. Establish a JSME (establish staff functions as outlined in subparagraph 2g, above).

8. JTF, J-6, will:

a. Establish a JTF JSME.

b. Provide the JSME with the JTF neys to be included in the JCEOI.

c. Assist the EWO in integrating EW activity into operations to ensure minimum impact on friendly use of the EMB.

d. Update the JRFL as required.

e. Serve as the IO Cell 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.

f. Assist the JSME with coordination of the component command resolution of reported instances of interference or disruption.

9. Services will:

a. Ensure that personnel assigned to the combatant commander and JFC and/or JTF frequency management billets are properly trained and have adequate security clearances (Top Secret/SCI preferred) to operate in the joint environment.

b. Equip and train frequency management personnel to operate the DOD-wide standard spectrum management information system to plan, coordinate, and control electromagnetic spectrum use at the Service, combatant commander JFMO, and JSME levels.

10. Defense agencies and other joint activities will:

a. Establish internal policy and procedures consistent with this instruction.

b. Include spectrum use considerations in the JOPES.

11. Director National Security Agency/Chief, Central Security Service. As principal SIGINT and INFOSEC adviser to the Secretary of Defense, Director of Central Intelligence, and the Chairman of the Joint Chiefs of Staff, is responsible for:

a. Executing the INFOSEC responsibilities of the Secretary of Defense in support of electromagnetic spectrum use.

b. Providing SIGINT support for spectrum use efforts of combatant commanders and other commanders designated by the Chairman of the Joint Chiefs of Staff in accordance with their expressed formal requirements.

c. Within appropriate classification guidelines, providing target frequency data and JRFL input to JSME to ensure maximum protection from friendly interference or EW against vital SIGINT targets.

12. Commander, JSC, under the operational direction of the Joint Staff, J-6, will:

a. Develop, maintain, and distribute EMC data, spectrum engineering tools, and EMC analysis models.

b. Provide spectrum management, interference resolution, E3 support, and direct support teams to combatant commanders and JTF commanders.

c. As requested, review E3 and spectrum management aspects of operational plans.

d. Develop and manage a DOD-wide standard joint spectrum management system for planning, coordinating, and controlling electromagnetic spectrum use in joint military operations. Assist the Services in ensuring full interoperability between the joint and Service spectrum management systems.

13. Spectrum users will:

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

b. Use frequencies, as assigned, and operate systems according to parameters authorized by the frequency certification and assignment processes.

c. Coordinate any need to exceed or operate outside the parameters authorized through the appropriate joint force component.

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

e. Report incidents of unacceptable EMI to the appropriate joint force component or to the joint force JSME.

ENCLOSURE B

REFERENCES

- a. DOD Directive 4630.5, 11 January 2002, "Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)"
- b. DOD Directive 3222.3, 20 August 1990, "Department of Defense Electromagnetic Compatibility Program (EMCP)"
- c. DOD Directive 4650.1, 24 June 1987, "Management and Use of the Radio Frequency Spectrum"
- d. DOD Directive 5000.1, 23 October 2000, "The Defense Acquisition System"
- e. DOD Directive 5100.35, 6 May 1985, "Military Communications-Electronics Board"
- f. CJCSI 3210.03 series, "Joint Electronic Warfare Policy"
- g. CJCSI 3213.01 series, "Joint Operations Security"
- h. CJCSI 3320.02 series, "Joint Spectrum Interference Resolution (JSIR)"
- i. CJCSM 3320.01 series, "Joint Operations in the Electromagnetic Battlespace"
- j. CJCSI 3100.01 series, "Joint Strategic Planning System"
- k. CJCSI 6510.01 series, "Defense Information Warfare Implementation"
- l. JP 1-02, 12 April 2001, "Department of Defense Dictionary of Military and Associated Terms"
- m. JP 3-13.1, 7 February 1996, "Joint Doctrine for Command and Control Warfare (C2W)"
- n. JP 3-51, 7 April 2000, "Joint Doctrine for Electronic Warfare"
- o. MIL-STD-461D, 11 January 1993, "Requirements for the Control of Electromagnetic Interference"
- p. MIL-E-6051D, 7 September 1967, "Electromagnetic Compatibility Requirements Systems"

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GLOSSARY

PART I -- APPREVIATIONS AND ACRONYMS

AOR	area of responsibility
C2	command and control
C2W	command and control warfare
CD-ROM	compact disc-read only memory
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
CJTF	commander, joint task force
COMPLAN	communications plan
DATT	Defense Attaché
E3	electromagnetic environmental effects
EMB	electromagnetic battlespace
EMC	electromagnetic compatibility
EMI	electromagnetic interference
EW	electronic warfare
EWO	electronic warfare officer
IAW	in accordance with
INFOSEC	information security
IO	information operations
IT	information technology
J-2	intelligence directorate of a joint staff
J-3	operations directorate of a joint staff
J-6	command, control, communications, and computer systems directorate of a joint staff
JCEOI	Joint Communications-Electronics Operation Instruction
JFC	joint force commander
JFMO	Joint Frequency Management Office
JOPES	Joint Operation Planning and Execution System
JP	joint publication
JRFL	Joint Restricted Frequency List
JSC	Joint Spectrum Center
JSME	Joint Task Force Spectrum Management Element
JTF	joint task force
NSS	National Security Systems
OMC	Office of Military Cooperation
OPLAN	operation plan in complete format

SCI	sensitive compartmented information
SIGINT	signals intelligence
USG	US Government

PART II -- DEFINITIONS

electromagnetic compatibility. The ability of systems, equipment, and devices that utilize the electromagnetic spectrum to operate in their intended operational environments without suffering unacceptable degradation or causing unintentional degradation because of electromagnetic radiation or response. It involves the application of sound electromagnetic spectrum management; system, equipment, and device design configuration that ensures interference-free operation; and clear concepts and doctrines that maximize operational effectiveness. (JP 1-02)

electromagnetic environmental effects (E3). The impact of the electromagnetic environment upon the operational capability of military forces, equipment, systems, and platforms. It encompasses all electromagnetic disciplines, including electromagnetic compatibility and electromagnetic interference; electromagnetic vulnerability, electromagnetic pulse, electronic protection, hazards of electromagnetic radiation to personnel, ordnance, and volatile materials; and natural phenomena effects of lightning and precipitation static. (Joint Pub 1-02)

electromagnetic interference (EMI). Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment. It can be induced intentionally, as in some forms of IO, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and so forth. (Joint Pub 1-02)

electronic attack (EA). That division of electronic warfare considered a form of fires, involving the use of electromagnetic energy, directed energy, or antiradiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability. (Joint Pub 1-02)

electronic warfare (EW). Any military action involving the use of electromagnetic and direct energy to control the electromagnetic spectrum or to attack the enemy. (Joint Pub 1-02)

frequency assignment. Authorization given by an administration, or other authority, for a radio station or other emitter to use a specific frequency under specified conditions.

information operations (IO). Actions taken to affect adversary information and information systems while defending one's own information and information systems. (Joint Pub 1-02)

joint force commander. Combatant commander, subunified commander, or JFC commander authorized to exercise combatant command (command authority) or operational control over a joint force designated by the President or Secretary of Defense. (Joint Pub 1-02)

spectrum management. Planning, coordinating, and managing joint use of the electromagnetic spectrum through operational, engineering, and administrative procedures. The objective of spectrum management is to enable electronic systems to perform their functions in the intended environment without causing or suffering unacceptable interference. (Joint Pub 1-02)

telecommunications. Any transmission, emission, or reception of signs, signals, writings, images, sounds, or information of any nature by wire, radio, visual, or other electromagnetic systems. (Joint Pub 1-02)

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