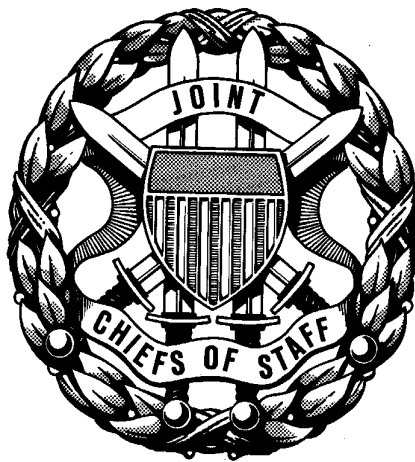


CJCSM 3212.02C
20 March 2011

**PERFORMING ELECTRONIC
ATTACK IN THE U.S. &
CANADA FOR TESTS,
TRAINING, AND EXERCISES**



JOINT STAFF
WASHINGTON, D.C. 20318

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CHAIRMAN OF THE JOINT CHIEFS OF STAFF MANUAL

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CJCSM 3212.02C

20 March 2011

PERFORMING ELECTRONIC ATTACK IN THE UNITED STATES AND CANADA FOR TESTS, TRAINING, AND EXERCISES

References: See Enclosure N.

1. Purpose. This manual implements guidance for the conduct of electronic attack (EA) in tests, training and exercises in the United States and Canada. Background information on the authority to conduct EA and Service responsibilities for coordinating planned EA are contained in Enclosures A and B respectively.
2. Cancellation. This manual supersedes CJCSM 3212.02B, 15 October 2003, which is hereby canceled.
3. Applicability. EA is a subdivision of electronic warfare (EW), a broader term that also includes the electronic protect (EP) and EW support (ES) subdivisions. EA is defined as a division of EW involving the use of electromagnetic energy, directed energy, or anti-radiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability and is considered a form of fires. The restrictions and procedures covered by this manual, however, specifically refer to nondestructive radio frequency (RF) EA having the potential to interfere with authorized RF spectrum use. Specific requirements addressing space-related EA issues are outlined in Enclosure A of reference a, and must comply with paragraph 4.14 of reference b, unless otherwise noted. This manual outlines the coordination requirements and operational procedures governing EA conducted by U.S. forces in the United States and Canada. It applies to:
 - a. All Department of Defense (DOD) components in the United States and Canada that are:
 - (1) Engaged in EA operations for tests, training, and exercises.

(2) Operating electromagnetic radiating or receiving equipment that may be subjected to interference from EA.

b. Contractors performing EA for the DOD. These contractors must meet the following criteria:

(1) The contractor must be performing under a U.S. military contract.

(2) The EA equipment used by the contractor has been contracted for, or is owned by, the U.S. Government.

(3) A resident military representative must be available to assist the contractor in the application of this regulation and in obtaining the EA clearance approval.

(4) The approved EA clearance must be on file with the DOD office administering the contract.

4. Procedures. See Enclosures C through H.

5. Summary of Changes. This manual should be reviewed in its entirety. The guidance and directives herein were revised from the previous version. Procedures, restrictions, and definitions have been added, updated, or clarified. Global Positioning System (GPS) EA procedures are now detailed in CJCSM 3212.03. Basic responsibilities and most terms and definitions remain unchanged.

6. Releasability. This manual is approved for limited release. DOD components (to include the combatant commands) and other Federal agencies may obtain copies of this manual through controlled Internet access only (limited to .mil and .gov users) from the CJCS Directives Home Page, reference c. Joint Staff activities may access or obtain copies of this manual from the Joint Staff LAN.

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



CRAIG A. FRANKLIN
Major General, USAF
Vice Director, Joint Staff

Enclosures:

- A -- Authority to Conduct Electronic Attack
- B -- Responsibilities
- C -- Frequency Clearance and Notification Requirements
- D -- Radio Controlled Improvised Explosive Device (RCIED) EA Frequency Clearance Requests
- E -- EA Coordination Flowcharts
- F -- OPSEC Considerations
- G -- EA Frequency Clearance Notification
- H -- CEASE BUZZER/CEASE MUSIC Procedures
- I -- EW Frequency Band Designations
- J -- FCC Field Offices
- K -- FAA Regional Offices and Areas of Responsibility
- L -- DOD Geographic Area of Cognizance/Agencies DOD Area Frequency Coordinators
- M -- NORAD EA Coordination Addresses
- N -- References
- GL -- Glossary

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ENCLOSURE A

AUTHORITY TO CONDUCT ELECTRONIC ATTACK

1. The Communications Act of 1934 as amended by the Telecommunications Act of 1996. Reference a regulates the frequencies for radio stations “belonging to and operated by the United States which are assigned by the President.” In the United States, radio spectrum may be allocated to either federal government or nonfederal government use exclusively, or for shared use. Regulatory responsibility for the radio spectrum is divided between the Federal Communications Commission (FCC) and the National Telecommunications and Information Administration (NTIA). The FCC, an independent regulatory agency, is assigned responsibility for the regulation of nongovernment interstate and foreign telecommunications. The Presidential authority for federal government RF spectrum use has been delegated to the Administrator, NTIA, an operating unit within the Department of Commerce.

2. NTIA Authority. The Administrator, NTIA, discharges radio communication and frequency management functions for the federal government with the advice of the Interdepartmental Radio Advisory Committee (IRAC). The IRAC consists of representatives from key government departments and agencies, including each Military Department. The United States Table of Frequency Allocations, published by the Federal Register, is the source document listing authorized federal government and nonfederal government RF spectrum allocations for the United States. This table defines frequency allocations as primary and secondary services. Authorized users have the right to operate in their respective services free from interference. Outside of DOD EW test and training ranges, EA is not recognized by the NTIA or the FCC as an authorized service. With the proper coordination, however, EA may be performed under the condition that harmful interference will not affect authorized services.

3. In Canada. Reciprocity agreements between the United States and Canada allow U.S. forces to carry out EA exercises within Canadian territory. Legislative authority can be found in (Canadian) section 12b of the Radio Communication Regulations made pursuant to section 4(1) of the (Canadian) Radio Communications Act 1989, c.17, s.2. The Canadian Department of Industry (Industry Canada) is the national authority for spectrum management.

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ENCLOSURE B

RESPONSIBILITIES

1. This manual sets forth Agency and organizational responsibilities regarding RF clearance coordination for the performance of EA in the United States and Canada during tests, training, and exercises.
2. U.S. forces are employed under the authority of the Combatant Commanders. Services must ensure forces can operate in an intense EW environment; therefore, DOD training, tests and exercises involving EA are vital to the effective employment of combat forces. Counter Improvised Explosive Device (IED) and asymmetric warfare EA requirements have become one of the most intense and integrated forms of EW on the modern battlefield and requires continuous development and testing of technology.
3. Reference a is designed to serve national security and defense as well as other national policies and goals involving spectrum-dependent equipment. Additionally reference d and as later amended states “The Secretary of Transportation shall... give full consideration to the requirements of national defense.” DOD EA operations are a part of national defense and once approved under the auspices of this manual should not be terminated except as specified below. Operators will comply with Enclosures C, D, H, and CJCSM 3212.03 for termination of EA (“cease buzzer” procedures). The following are valid reasons for termination:
 - a. Safety of flight.
 - b. Harmful interference.
 - c. Operations security (OPSEC).
 - d. Determination of the EA user.
4. The conduct of EA, in areas as defined in this manual’s glossary under the definitions of Canada and United States and Possessions (US&P), is governed by this manual under the authority of references d and e. International Civil Aviation Organization (ICAO) and reference e provide further considerations for conducting EA within international airspace, but do not govern DOD component EA operations.
5. The impact of the electromagnetic environment (EME) upon the operational capability of military forces, equipment, systems, and platforms is referred to as electromagnetic environmental effects (E3). E3 refers to the impact of the

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EME upon the operational capability of military forces, equipment, systems, and platforms. It encompasses all EM disciplines, including EM compatibility (EMC) and EM interference; EM vulnerability; EM pulse; EP, hazards of EM radiation to personnel, ordnance, and volatile materials; and natural phenomena effects of lightning and precipitation static. Equipment and systems operating on the principles of electromagnetism are characterized by EM vulnerability. Once subjected to E3, equipment and systems operating within, or as part of, the electromagnetic spectrum (EMS), may suffer degradation and become (incapable of performing the designated mission). The environmental consequences of EA and its employment must be analyzed in accordance with provisions of reference f and the accompanying Council on Environmental Quality Regulations. Consult specific-Service regulations.

ENCLOSURE C

FREQUENCY CLEARANCE AND NOTIFICATION REQUIREMENTS

1. Purpose. This enclosure explains coordination requirements and delineates procedures for submitting EA clearance request messages.

2. EA Coordination. EA coordination minimizes the likelihood of EA interference to authorized RF spectrum users. In an increasingly crowded and dynamic RF spectrum, proper EA coordination serves to protect the portions of the spectrum currently available for EA from future restrictions caused by occurrences of unintentional interference. EA coordination is required when a user desires to conduct EA in a frequency band where authorized users of primary or secondary services are assigned. National-level coordination involves submitting an EA clearance request through the applicable Military Department Frequency Management Offices (MILDEP FMOs) in order to obtain an EA clearance. In Canada, all EA requires national coordination. In the United States, some portions of some bands may not require national-level coordination via an EA clearance request. Even in these cases, however, coordination with applicable agencies familiar with local EA restrictions is always required.

3. EA Clearance Request Coordination Requirements. The coordination requirements for EA in the United States and Canada are based on the desired EA frequency band, the geographical area, proposed duration and time of the EA operation.

a. All EA operations conducted in frequency bands annotated as “national” in Enclosure I require national-level coordination. For these operations, an “EA Clearance Request for Nationally Controlled Frequencies” must be submitted to the respective MILDEP FMO for review and approval 60 days prior to the requested start date. Requests will normally be submitted via message with the exception of GPS, remote controlled improvised explosive device (RCIED), and other space-related EA requests, which will normally be submitted via SIPRNET (unclassified requests may be submitted via NIPRNET). Details regarding GPS EA requests can be found in CJCSM 3212.03. Other space-related EA requests will use references a and b for guidance. The proposed geographical area determines which DOD Area Frequency Coordinator (AFC), Fleet Area Control and Surveillance Facility (FACSFAC), or Service point of contact (POC) is responsible for coordinating the EA request and submitting it, if required, to the respective MILDEP FMO.

(1) Geographic Areas under the Cognizance of DOD AFCs or FACSFACs. EA clearance request messages will only be submitted to the

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MILDEP FMO by the DOD AFC or FACSFC (for afloat naval operations) having jurisdiction over a controlled geographic area (Enclosure L). As an exception, the DOD Eastern AFC (EAFC) at Patrick AFB, FL, requires EA users or planners requesting to conduct EA along the Eastern Range to first coordinate with the EAFC and then submit an EA clearance request directly to the MILDEP FMO.

(2) Areas Not under the Cognizance of DOD AFCs or FACSFCs. For geographic areas not under the cognizance of an AFC or FACSFC as listed in Enclosure L, review COCOM area policy for spectrum support and submission requirements. EA users must coordinate EA clearance requests through Service POCs. Users requesting to perform EA under the procedures in this manual coordinate through established Service POCs and must be familiar with their Service's specific procedures. Service POCs are familiar with the EA coordination process as well as local EA coordination issues. These POCs vary between Services and geographical areas and are not listed in this manual. Services may submit them as future changes. EA users not aware of the proper Service POC to use in the EA coordination process should contact their MILDEP FMO for that information (paragraph 4 of this enclosure).

b. Frequencies with "Local" or "Local (FCC)" Coordination Requirement. Frequencies listed in Enclosure I with "Local" or "Local (FCC)" coordination requirements do not normally require an EA clearance request to be submitted to the MILDEP FMO. These frequencies have been nationally coordinated. However, local coordination is still required. Users desiring to perform EA in or within line-of-sight (LOS) of a DOD AFC or FACSFC area must coordinate with that agency. In all other areas not covered under COCOM area of responsibility (AOR) policy, users coordinate through their Service POCs.

c. Tactical Communications Frequencies. Enclosure I lists frequencies in the 30-400 MHz region as requiring national-level EA coordination. An exception to the requirement for national coordination in this band applies to units conducting EA on assigned tactical frequencies. When EA on these specific frequencies has been coordinated with the applicable units and EA parameters fall within the assignment restrictions, no national coordination is required. For example, EA against communications systems may be conducted by attaching jamming signal simulators to standard communications equipment. When this procedure uses assigned communications frequencies at their assigned power, bandwidth, and location, no special clearance procedures are required. Service POC coordination is sufficient to determine whether this situation applies, clearance to enter into an approved MOA is also clearance to perform EA.

d. Coherent Repeaters. Non-communications coherent repeater jamming (such as angle deceivers and break lock techniques) does not have a significant effect on non-victim receivers and does not require an EA frequency clearance.

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e. EW Test Equipment/EW Range Emitters. Clearance procedures for the operation of threat emitters used on EW ranges are not covered in this manual. The normal frequency assignment process outlined in the NTIA “Manual of Regulations and Procedures for Federal Radio Frequency Management” should be used to obtain frequency assignments for devices that are not jammers. Each of the Services has instructions implementing NTIA manual guidance.

f. EW test equipment falling under certain MIL-STD requirements having undergone a variety of assessments to determine their vulnerability to EMI, are waived of any additional requirement for operational certifications or clearances

4. MILDEP FMOs. The reallocation of federal RF spectrum is an ongoing process that can affect EA clearance coordination requirements. The MILDEP FMOs have the latest information on spectrum use and ongoing spectrum reallocation actions and will factor this knowledge into the national coordination process. MILDEP FMOs will work with DOD AFCs, FACSFACs, Service POCs, and users to ensure users desiring to conduct EA are able to do so while minimizing the impact to other spectrum users. The following are the MILDEP FMOs for the Services and Canada:

- a. Army: Army Spectrum Management Office
2461 Eisenhower Ave
Hoffman I Room 1204
Alexandria, VA 22331-2200
(703) 325-8213/8200 (DSN 221)
DMS MSG ADD: ARMY SPECTRUM MGT (SC)
- b. Navy/Marine Corps:
Navy and Marine Corps Spectrum Center
2461 Eisenhower Ave
Hoffman I Room 1201
Alexandria, VA 22331-1500
NMCSC: (703) 325-2822. DSN: 221
DMS MSG ADD: NAVMARSPECCEN
WASHINGTON DC (SC)
- c. Air Force: Air Force Frequency Management Agency
2461 Eisenhower Ave
Hoffman I Room 1203
Alexandria, VA 22331-3012
(703) 428-1544 (DSN 328)
DMS MSG ADD: AFFMA (SC)

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d. Canada:

ATTN: DTSES 5
National Defence Headquarters
Colonel By Drive
Ottawa, Ontario K1A0K2
(613) 992-8744
DMS MSG ADD: NDHQ OTTAWA//DTSES 5//

5. The EA Coordination Process. All EA operations require coordination with the applicable AFC or FACSAC when conducted inside of or within LOS of their geographic area of jurisdiction. At the initiation of this coordination process, the DOD AFC or FACSAC will determine whether local coordination will meet the EA requirement, whether an existing EA clearance covers the situation, or whether a new national EA clearance request and notification procedure is required. For EA operations in other geographic areas, Service POCs will determine the coordination requirements when not specified by COCOM guidance. To aid in the understanding of the EA coordination process, Enclosure E includes a series of flow charts (Figures 1 through 5).

6. Routine, Special, and Short-Notice EA Operations

a. Routine EA Operations. Routine EA operations are defined as frequently recurring EA training or EA equipment checks with standardized times and/or procedures in an approved area. Requests for routine EA operations in each test range area, training area, restricted area, warning area, or military operating area (MOA) will be submitted through the channels noted above. If required, the MILDEP FMO will submit requests to the appropriate Federal Aviation Administration (FAA) and FCC national and regional offices (see Enclosures J and K) as information addressees. For afloat naval operations, FACSACs will submit blanket EA requests for the warning areas where fleet exercises and EA operations are routine events (such as SOCAL or VACAPES). When the requester of an EA clearance is notified by the MILDEP FMO of the approved EA activity for an area, notification should be sent from the requester (i.e., AFC, FACSAC, etc.) by message to all users detailing the operating conditions under which the EA operations are authorized.

(1) Prior to submitting an EA clearance request or scheduling EA operations, coordination with FAA and FCC regional offices is encouraged. The MILDEP FMO will affect the final coordination with the FAA headquarters (ASR-100) and the FCC headquarters (spectrum management and other applicable national-level agencies) in order to issue an EA clearance notification for national frequencies. The FAA or FCC headquarters will normally respond to such EA clearance requests within 30 calendar days of receiving the request. Approval can be granted for up to a maximum of 1 year for a specific frequency and/or frequency band, geographic area, altitude, time of activation, and set of transmission parameters. This allows the conduct of

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EA activity on a routine (training or annual exercises) or prescheduled (testing) basis within the defined operating limits contained in the approved clearance request.

(2) Test ranges and AFCs having yearly EA clearance requests approved at the national level can issue clearances for any operation in their area based on the operating parameters authorized in the EA clearance notification for national frequencies message. Once a yearly request has been approved, it will be subject to review and revalidation for reapproval by national level agencies 1 year from the approval date. Users must review and revalidate requirements at least 45 days prior to expiration of the clearance. If no changes are required, users submit a new request with the new dates and reference the old clearance. If modifications to a current authorization are required, they will be submitted through the MILDEP FMO, with the original approval request number and dates cited.

b. Special EA Operations. Special EA operations are defined as exercises, tests, and/or training, conducted on other than a frequently recurring basis. Special EA operations may require a planning conference for coordination of operating areas, times, and/or procedures. If the controlling agency for the area you wish to operate in has an approved clearance for the required frequency/area, you do not have to submit an EA clearance request as long as your operations do not exceed the existing assigned parameters. An EA planning conference is recommended in order to facilitate coordination. The sponsoring controlling agency will notify appropriate agencies of the planning conference. If a planning conference is not held, the appropriate controlling agency or Service-specific POC for each area may coordinate with the regional FAA or FCC frequency managers and North American Aerospace Defense Command (NORAD) to expedite the clearance process as necessary.

c. Short-Notice Events. Short-notice events are those events not meeting the required lead-time for the submission of an EA clearance request. To minimize the impact of unforeseen clearance needs, the operational user shall make every effort to predetermine geographic areas, frequencies, time etc., and submit requirements for routine or special EA operations. When short-notice approval is needed for bands requiring national coordination, the AFC/Service POC will contact the Service MILDEP FMO directly and follow up with a message or written request to the proper addressees. The MILDEP FMO will determine the urgency of the request and accomplish the required coordination for approval. When short-notice approval is needed for bands not requiring national coordination, coordination with the FCC, DOD AFC and/or the controlling agency for the area shall be accomplished prior to the operation.

d. GPS EA. EA clearance requests for routine, special, and short-notice EA operations involving emissions on GPS frequencies L1 through L5.

e. RCIED EA. EA clearance requests for routine, special, and short-notice EA operations involving emissions in the RCIED threat bands must be submitted 45 calendar days prior to the requested mission start date in order to allow sufficient time for national coordination and spectrum plot analysis (see Enclosure D).

f. Space Systems. Specific requirements addressing space-related EA issues are outlined in reference a and must comply with reference b, unless otherwise noted.

g. Directed Energy (DE) Systems. Specific requirements addressing DE issues are outlined in reference a. Laser specific issues must also comply with reference g.

7. Summary of Operations for which EA Clearance Requests are Not Required

a. EA operations in frequency bands where initial coordination with DOD AFCs, FACSFACs, Service POCs, or MILDEP FMOs has determined an applicable EA clearance exists.

b. EA operations in frequencies listed in Enclosure I as “Local” or “Local (FCC).” Local coordination is still required through the DOD AFC or FACSFAC when within LOS of their geographical area of jurisdiction, or Service POC in other areas.

c. Assigned tactical communications frequencies in the 225-400 MHz region as discussed in subparagraph 3c above.

d. Coherent repeaters as previously described in subparagraph 3d above.

e. EA operations in frequency bands operating in “training-mode.”

8. EA Coordination with Canada. Coordination with National Defence Headquarters (NDHQ), Ottawa, Director Telecommunications and Spectrum Engineering and Support 5 (DTSES 5), is required to conduct any EA in Canada. NDHQ/DTSES 5 (Canadian MILDEP FMO) will accomplish the coordination for all types of EA including chaff. EA requests are to follow the procedures outlined in paragraphs 9 and 10 below. MILDEP FMOs will coordinate applicable EA clearance requests with NDHQ/DTSES 5.

9. EA Clearance Request Procedures. The following information will be provided when initial coordination determines an EA clearance request is required for national coordination. Detailed information assists national coordinating agencies in assessing the impact of EA operations on the RF spectrum and expedites the approval process. However, do not delay submission of initial requests to achieve completeness. Follow-on requests can

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be forwarded when additional information becomes available. Ensure written requests are properly classified. See CJCSM 3212.03 for guidance concerning submission of GPS EA requests and Enclosure D for guidance concerning submission of RCIED EA requests.

a. Submitting Clearance Requests. EA clearance request messages will be submitted using the coordination process specified above and in Enclosure E, for action to the MILDEP FMO.

b. EA Request Information Addressees. Use the following INFO addressees, as applicable, when submitting EA clearance requests:

(1) CDR USNORTHCOM PETERSON AFB CO//J3/J6/J653/J7//.

(2) CDR USJFCOM NORFOLK VA//J3/J6/J7// and JFMO LANT NORFOLK VA (for training/exercises conducted under USJFCOM auspices).

(a) AUTODIN MSD ADD: HQ USPACOM HONOLULU HI//J613/J39// and JFMO PAC HONOLULU HI//J613// for Hawaii OPAREA within 200 nm.

DMS MSG ADD: HQ USPACOM J6 and JFMO PAC (SC) for Hawaii OPAREA within 200 nm.

(b) AUTODIN MSG ADD: HQ USPACOM HONOLULU HI//J613/J39// and JFMO GUAM ISLAND GU for Guam OPAREA within 200 nm.

DMS MSG ADD: HQ USPACOM J6 and JFMO GUAM (SC) for Guam OPAREA within 200 nm.

(3) CMOC CHEYENNE MOUNTAIN AFS CO//J3/J35/AWC/MWC/SCC//.

(4) DOD AFC (See Enclosure L).

(5) FAA NATIONAL HQ WASHINGTON DC//ASR-100//.

(6) FAA Regional FMO (See Enclosure K).

(7) Appropriate FAA Air Route Traffic Control Center (ARTCC).

(8) FCC WASHINGTON DC//Frequency Liaison Branch//.

(9) Appropriate FCC field operations office.

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(10) Appropriate NORAD regions and sectors that may be affected.

(11) NDHQ OTTAWA//DTSES 5//(for Canadian EA clearances).

(12) HQ USAF WASHINGTON DC// AF/A5RE //, and additionally for GPS or space-related operations: AF/A3Z-SC, AF/A3Z-ST, AF/A3Z-SO.

(13) COGARD NAVCEN ALEXANDRIA VA//NIS// (for maritime operations).

(14) DISA JSC COMMCTR.

(15) NTIA WASHINGTON DC.

c. Message Information Requirements

(1) Subject. (Routine, Special, or Short-Notice). "EA Clearance Request For Nationally Controlled Frequencies"

(2) Point of Contact. Enter unit/designator, Service/MILDEP, POC, commercial and DSN telephone numbers, and e-mail address.

(3) EA Clearance Request Control Number. This number will consist of an appropriate controlling agency designation/abbreviation, the calendar year, and a hyphen followed by a consecutively assigned number.

Example: 1ECRG 01-4 is the fourth clearance request for CY 2001 by HQ ACC, 1st Electronic Combat Range.

(4) Period of Request. From approval date until required review.

(5) EA Operating Areas, Flight Routes, Altitudes, Times and Radius of Operation

(a) Operating Areas. Specifically define the geographic bounds in which EA operations will occur. Coordinates will be used to indicate location of ground-operated EA equipment (not radars or other radar/emitter simulators - see subparagraph 3e). Airborne, shipboard, and/or ground-based EA usage will be defined from a central point (or a group of central points, identified by geographic coordinates and radius of operations of each). The name/nomenclature of known MOA(s), restricted areas and warning areas, flight levels or a combination of these will be included in proposed test areas.

Example: (for warning area) "route of flight within W-368/369 entering from SE" and the central geographic coordinates and nautical mile radius of test areas.

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Example: (Geographic bounds) 3023N 08600W, 3023N 08700W, 2958N 08600W, 2958N 08700W. Operations occur within a 25 nm radius of 302300N 08626W.

(b) Route of Flight. Provide a complete description of the operational portion of flight routes, including turn points. Include all EA start and stop geographic coordinates in the area. Specify any flexibility available in flight routes. Provide an appropriate rationale if variations in activities preclude providing specific details. Without this rationale or operational specifics, the resulting clearance may not meet all requirements.

Example: 25 nm N/S and 25 nm E/W routes from a central point on the Eglin range located at 3023N/08626W. Some test flights extend further south over water into warning areas W155 and W151A. Routine EA start and stop points are on routes defined by longitude 08600W to 08700W at a latitude of 3023N and 2958N to 3048N at a longitude of 08626W, with turn points at the extreme of each route. Other flight routes are available, but it is important to maintain certain aircraft/ground simulator relationships to ensure adequate testing.

(c) Altitudes. Specify altitudes above ground level (AGL) or mean sea level (MSL) if over water or over areas where specifying AGL altitude is impractical. Provide the complete range of altitudes acceptable for operations, and specify the most desired altitude within the acceptable range. Lower altitudes increase the probability of approval. Specify AGL altitudes where chaff drops will occur.

Example: 0 - 50,000 ft AGL; for most operations 20,000 ft is the most desired altitude for fuel economy reasons. Lower altitudes can be accepted, but will degrade the continuity of training due to reduction in flight duration. Flying at 10,000 ft will increase the cost of operations by an average of 30 percent for fuel. Flying below 9,000 ft places aircraft in a visual flight rules (VFR) traffic corridor near the Florida coastline. All use of EA expendables are at or below 10,000 ft AGL and conducted over water in W151A.

(d) Topographical Layout. Identify specific terrain features masking the effects of the proposed EA and reduce unintended harmful interference.

Example: Area of EA operations is bordered by 5,000-7,000 ft mountains to the north and west.

(e) Times. Provide the daily timeframe in which operations may occur. Express times in Coordinated Universal Time (UTC) and local time.

State if operating hours are inflexible or limited and why. Identify flexibility in operating times.

Example: 0000-2400 hrs daily, however, operations are not continuous, and the operating period is normally no longer than 12 hours, from 0600L-1800L (1100Z-2300Z, 1000Z-2200Z during daylight savings time) daily with variations based on need of the testers.

(f) Expected Duration per Activity. Provide expected duration, in minutes, of an average EA event.

Example: A single EA event lasts no longer than 90 minutes and may start at any time during the operating period.

(6) Positive Control. Provide information concerning standard regulations and/or special operating procedures followed, notification procedures, crew-monitoring procedures, range-monitoring procedures, and how chaff drops are controlled.

Example: Positive control is provided for all EA activity.

(a) Coordination is accomplished in accordance with this manual, reference g, and other applicable guidance for specific geographical areas.

(b) Users must monitor appropriate Air Traffic Control (ATC) and guard frequencies at all times, and range controllers must monitor communications channels and any jammers employed for frequency drift. "Cease Buzzer" calls require immediate shutdown of EA operations. Additionally, a CEASE BUZZER call should be accompanied by the appropriate band and channel designators whenever possible to preclude unnecessarily causing all EA training within radio range of the CEASE BUZZER call to be interrupted or cease (e.g. "CEASE BUZZER, E10, and FOX1").

(c) Before chaff drops are approved on a range, a single bundle of chaff is dispensed to determine if conditions are favorable and to preclude unplanned drifting of chaff clouds. For afloat naval operations, policy prohibits dropping chaff if predicted impact footprint is within 30 nm of any landmass.

(7) EA Frequency Requirements and Specifications Tables. Provide a listing of required frequencies and specifications of EA jamming equipment to be used. Table 1 is an example of an EA jamming requirements table, which shows the frequency requirements and jamming equipment specifications delineated below. Ensure information provided is properly classified.

(a) Frequencies Requested. Specify the actual operating frequencies of each ground, shipborne, or airborne “simulator” or radar that EA will be conducted against. If the simulator/radar is frequency-agile, give the tuning limits (or operating channels if tuning range is channelized). In general, if FAA/FCC bands are affected, they will bracket their restricted frequency ranges and allow DOD use of the rest of the band, if appropriate.

<u>Frequency/Tuning Range</u> ¹	<u>Min BW/PWR</u>	<u>Max BW/PWR</u>	<u>Ant/BMW</u> ²
2,400/None	50/20 Watts	200/5 Watts	Horn/120
2,450/2,400-2,600	3	3	3
3,200/3,200-3,400 ⁴	3	3	3
3,320/3,200-3,400 ⁴	3	3	3
3,700/3,600-3,800	3	3	3
5,250/5,200-5,400 ⁵	3	3	3
5,350/5,200-5,400 ⁵	3	3	3
6,500/6,200-6,800	3	3	3
6,900/None	3	3	3
7,100/6,700-7,400 ⁶	3	3	3
7,125/6,700-7,400 ⁶	3	3	3
7,150/6,700-7,400 ⁶	3	3	3
7,850/7,800-8,500	3	3	3
8,900/7,800-8,400 ³	50/200 Watts	200/50 Watts	Horn/120
9,150/9,100-9,600	3	3	3
9,160/Fixed	3	3	3
9,200/8,500-9,600	3	3	3
12,700/12,700-13,300	3	3	3
14,500/14,000-15,000 ⁶	3	3	3
14,750/14,300-15,200	3	3	3

Remarks/Notes:
¹ EA in these bands is either noise or deception jamming.
² Effective antenna coverage is within 120° of the nose and tail of aircraft. Sidelobes 60°-120° and 240°-300° are up to 30 dB down.
³ Same bandwidth (BW)/power (PWR)/beamwidth (BMW) as listed in “2400/none” line.
⁴ Must have 60-MHz separation between these frequencies.
⁵ Must have 100-MHz separation between these frequencies.
⁶ Fixed channels in tuning range with 100-MHz separation.

Table 1. Example EA Frequency Requirement and Specification Table

(b) EA Jamming Equipment Specifications. Submit nominal worst-case equipment parameters, (i.e., do not list every transmitter or jammer operating in a requested frequency range). Equipment nomenclature is not required. Provide the following information for each frequency or frequency range of operation:

1. EA Transmitter Bandwidth and Power. Provide the proposed bandwidth of the jammer signal at the half-power (-3 dB) points and the jammer transmitting power in watts. If more than one bandwidth and transmitter power setting will be used, list the widest bandwidth and its

associated power, as well as the highest transmitter power and its associated bandwidth.

2. Antenna Gain and Directivity. Provide the antenna gain and directivity associated with the transmitters in each band of operation. Antenna gain is specified in dBi, while the antenna directivity is either non-directional or directional on a specific azimuth or azimuth range, for example 090-120 degrees True North. This information enables the deconfliction of EA and may preclude interference to others.

3. Remarks Section. Provide a short summary of the proposed purpose of the EA event. For example, "The purpose of this exercise is to prepare the carrier battle group for operations in a radar-denied environment." Identify types of jamming used (i.e., noise spot, deception jamming, etc.) and any other pertinent information, such as frequency change limitations or antenna information.

10. Clearance Requests for Chaff Operations

a. Environmental Policy. Due to the potential environmental hazards, chaff will not be dropped unless specific authorization is granted from the Service's environmental division. Training routes, ranges, and civil airspace in CONUS must have an approved environmental assessment before chaff may be released. Once environmental assessments have been accomplished, frequency clearances may be requested to dispense chaff. Once these requirements are met, chaff may be dispensed only under the following conditions:

(1) There are no Environmental Protection Agency restrictions in CONUS restricted air spaces (for example, air-to-ground gunnery ranges, or warning areas).

(2) Flying activities, complying with FAA regulations, are dispersed over a wide area and do not frequently (exceeding once per day) pass over the same ground points.

b. Interference. To eliminate harmful interference in dense air traffic areas and reduce the number of early EA terminations, every effort should be made to conduct chaff drops away from major air routes and air route hubs. Winds aloft will be plotted to ensure the chaff does not drift into major air routes and air route hubs. Even when chaff dispensing is terminated at the request of the ATC radar facility, the interference due to chaff may remain for some time.

c. Designated Chaff Drop Areas. Chaff drop areas throughout the continental United States (CONUS) (primarily within controlled airspace--MOAs, restricted areas, and warning areas) are established using normal clearance request procedures per paragraph 5. These areas, in general, were

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selected to provide safe separation distances from commercial air routes and airports. Once a clearance request is approved, any Service organization may use these areas as long as the activity is scheduled with the controlling agency (airspace owner), coordinated with the appropriate DOD AFC, conducted within the limits of the national clearance approval, and compliant with the following criteria:

(1) Chaff drops must be thoroughly mission planned. For each mission, consider the following factors during the planning phase:

- (a) The geographic features where the chaff is to be dispensed.
- (b) The wind conditions aloft.
- (c) Planned drop altitude and predicted rate of fall of chaff.
- (d) Allowances for error.

(2) INDIA and JULIET band chaffs may be dropped within the designated chaff drop areas with minimal restrictions, once an original clearance request has been approved (refer to Table 2). Interference to FAA systems by this chaff is considered minimal. However, the ARTCC shall be notified 10 minutes prior to the scheduled drop.

d. Restrictions on Rope Chaff. Rope chaff requires national-level approval, in addition to environmental approval. Rope chaff can damage high-voltage transmission lines and create hazards to life and property. Every precaution must be taken to ensure the rope chaff falls on water or on land devoid of high-voltage electric power transmission lines.

e. Chaff Frequency Requirements and Specifications

(1) Frequency Bands Affected. Include the chaff's cut frequency or specified frequency response in MHz. INDIA and JULIET-frequency bands are considered to have the least potential impact on air traffic control radars. State whether INDIA/JULIET band chaff has been considered for all training/testing. State under which circumstances other frequency band types of chaff (for example, RR-180) must be dropped. If it is necessary to drop chaff affecting the DELTA/ECHO frequency bands, describe safety precautions you intend to employ to prevent chaff from drifting into air traffic corridors or airport areas.

(2) Chaff Dispensing Information. Provide dispenser type, estimated fall, and dispersal rates if known, and the amount of chaff normally dispensed.

(3) Remarks or Notes. Add any germane information regarding specifics of chaff employment.

<u>Type</u>	<u>Frequency Range</u> ¹	<u>Resonant Frequencies</u>	<u>Fall Rate</u>
RR-1111	8,000 – 22,000	9, 12, 18, 21 GHz	98ft/min ²
RR-0000 ³	1,500 – 17,000	2, 4, 8, 16 GHz	Same

Remarks: Chaff drop activity is normally about 60 minutes or less in duration. Dispersal rate varies with wind conditions. The amount of chaff dropped varies between 50 and 500 bundles per operation. The percentage stream and burst is about 20 percent and 80 percent, respectively.

¹ Effective Frequency Range. Frequency response range is greater, but radar return is significantly reduced at lower or higher frequencies.

² Slowest estimated fall rate.

³ RR-180 chaff is required periodically for testing of equipment that operates in the lower portion of its frequency range. Testing cannot be accomplished with RR-172.

Table 2. Example EA Request CHAFF Information

f. Security Instructions. Classify in accordance with reference h and any applicable classification guides. Enter statement indicating which item entries singularly or collectively (note compilation rule in the directive) make the request classified.

ENCLOSURE D

RADIO-CONTROLLED IMPROVISED EXPLOSIVE DEVICE (RCIED) EA
FREQUENCY CLEARANCE REQUESTS

1. Purpose. This Enclosure outlines the coordination requirements and operational procedures governing RCIED EA tests and training conducted by U.S. forces and by civilian contractors supporting the DOD. These procedures are to be used for all testing and training conducted in the United States and Canada. Current Counter RCIED Electronic Warfare (CREW) systems are used in supporting major combat operations to prevent IEDs detonated by radio controlled or RF means. CREW systems are designed to prevent the receiver of an RCIED trigger from receiving its detonation signal through different forms of jamming techniques. CREW systems have the potential to cause unintentional electromagnetic interference (EMI) to civil and military RF spectrum users, with numerous instances of this occurring causing varying levels of interference and risk to operations and personnel. As these capabilities are developed, it is imperative that testing be accomplished, prior to fielding, to determine effectiveness against a variety of targets, while maintaining compatibility with other spectrum-reliant equipment, such as Blue Force communications, ISR systems, Explosive Ordnance Disposal Robots, RADARS, SIGINT, and other CREW systems. This enclosure provides the requirements and procedures for submitting RCIED EA frequency clearance requests for testing and training in U.S. and Canada. It has been closely coordinated with the FAA and FCC to ensure it meets the required coordination lead-times and technical criteria to prevent EMI to ATC and non-government systems. Organizations submitting RCIED EA requests covered in this Enclosure should provide a complete package as far in advance as possible. The request coordination and approval progress can be time consuming.

2. Applicability. The restrictions and procedures covered by this enclosure refer to nondestructive RF emissions generated during EA having the potential to interfere with authorized RF spectrum use, and apply to:

a. All DOD components in the United States and Canada that are:

(1) Engaged in RCIED operations for tests and training,

(2) Operating electromagnetic radiating or receiving equipment subjected to interference from EA.

b. Civilian contractors performing RCIED operations development and testing for the DOD. These contractors must meet the following criteria:

(1) The contractor must be performing under a U.S. military contract.

(2) The EA equipment used by the contractor has been contracted for or is owned by the U.S. government.

(3) A resident military must be available to assist the contractor in the application of this manual and the EA clearance approval.

(4) The approved EA clearance must be on file with the DOD office administering the contract or their delegated representative.

3. Policy. The following request and coordination procedures described in this manual are required to prevent EMI to ATC and other non-government systems. These procedures have been developed using lessons learned from tests, training, and interagency coordination, particularly with the FAA and FCC. Timelines of less than 65 days may be entertained based on the criticality of testing required.

a. Requesting units, organizations, and agencies within the CONUS and Canada will submit complete request packages via the appropriate chain of command (Major Command (MAJCOM) frequency coordinators, regional and area frequency coordinators (AFCs), FACSFACs, etc.) for active RF emission in FAA and FCC frequency bands. Complete request packages must be received by the MILDEP FMO no later than 60 days prior to the first planned RF emission. Organizations should plan to submit requests to ensure local and regional level coordination is complete prior to the 65-day national timeline. The contents of the EA frequency clearance request package are outlined in paragraph 6 of this Enclosure. Additional guidance on national level coordination is provided in references a, b, and d.

b. Local FAA and FCC coordination is not required for RCIED requests. RCIED requests are only analyzed at the FAA and FCC headquarters.

c. All RCIED requests for frequencies in FAA and FCC bands must include computer modeling of RF interference to determine areas of potential impact from RCIED emissions. These impact areas will be produced using an FAA-approved model, such as the Interactive Scenario Builder model developed by the Naval Research Laboratory (NRL), and will provide graphic plots to support analysis of interference to potential victim receivers, i.e., FAA ATC and non-government systems. A copy of Builder, the current FAA-approved modeling & simulation (M & S) program, and training can be requested through NRL at BuilderSupport@nrl.navy.mil, 202-767-6812. The process for collecting data supporting the builder analysis process is still in development and needs to be closely coordinated with the CREW PM's, JIEDDO, JSC, J39, and the appropriate test range frequency managers.

d. Security Instructions: classify the request package in accordance with reference i and other applicable classification guides. Enter a statement indicating which item entries singularly or collectively (note compilation rule in the directive) make the request package, or parts of it, classified. Even if the request itself is unclassified, it should be submitted via secure means because the association of the request with the modeling and analysis reveals a capability or possible vulnerability. RCIED testing and EA will not compromise classified capabilities. Security measures to minimize the risk of compromise should be considered.

e. Safety: RCIED EA and testing must not threaten human life or safety of flight.

4. Responsibilities and Procedures. The responsibilities described in this section detail the RCIED coordination process as diagramed in Enclosure E (Figures 1 through 5).

a. Range Frequency Managers. The frequency managers at the ranges tasked with RCIED testing shall work with the requestor to prepare the EA request and the M & S analysis plots. Since M & S software training is required, all frequency managers tasked/responsible for submitting RCIED requests need to be trained as soon as practical, well in advance of the 60 day lead time for submitting an EA package. At the initiation of the coordination process, the range frequency manager, or other requestor, will determine whether an existing EA clearance meets the requirement, or whether a new national EA clearance request and notification is required. All requests must indicate whether the request is new or is a renewal. If the request is a renewal, it must include the previous control number and highlight any changes from the previous request. Ranges should deconflict schedules when there is overlapping operations within ranges and AFC FMOs should deconflict surrounding AORs before submission to the Service FMOs.

b. AFCs and FACSFACTS. Area frequency managers and/or FACSFACTS will also check the items listed in para 3.a. above. In addition, they must ensure the requests are complete:

(1) Meet the requirements per this regulation;

(2) and are coordinated with all local entities operating within their area of responsibility.

(3) If another local or federal agency is impacted by the EA/testing and has a local representative available, pre-coordinate potential impacts and deconflict testing schedules to preclude major changes to the EA request after it is submitted for national-level coordination.

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(4) Service MAJCOM, Installation Spectrum Manager(s) (ISM), AFCs, Testers, and COCOM (s) are required to ensure a complete request package is submitted, and coordination is complete with affected regional and AFCs.

(5) Submit CREW request packages to MILDEP FMOs via the appropriate chain of command using SIPRNET email SIPRNET official government message (DMS, AMHS, AUTODIN), or other secure means, in accordance with (IAW) appropriate Security Classification Guidelines.

c. MILDEP FMOs. The MILDEP FMOs have the latest information on spectrum use, ongoing spectrum reallocation actions, and interagency coordination issues. They will factor this knowledge into the national coordination process. MILDEP FMOs will work with DOD AFCs, FACSFACs, ranges and other Service points of contact, and project managers to ensure users desiring to conduct EA or testing are able to do so while minimizing the impact to other spectrum users. (MILDEPs will review) MILDEP FMOs, as the last stop prior to initiating interagency coordination, will check the items listed in para 3.a. above, verify the originator's request package and assist in resolving conflicts between tests or exercises prior to submitting for outside agency coordination (FAA, FCC, etc.).

5. Program Executive Officer for Littoral and Mine Warfare, PMS-408 JCREW for the Joint CREW (JCREW) Acquisition Program of Record and Joint Improvised Explosive Device Defeat Organization (JIEDDO) for Urgent Funded CREW Systems. JCREW and JIEDDO are together the U.S. center of excellence for CREW System development, acquisition, and testing. Accordingly, JCREW and JIEDDO shall:

a. Provide technical support to facilities and or activities in producing or modifying an EA clearance request and analysis as required.

b. Be available and able to coordinate and provide a forum for DOD organizations and other federal agencies to convene technical working groups, as necessary for EA clearance activities.

c. Provide RCIED technical data and advice , as required for required interagency (i.e.: FAA, FCC) coordination, and dispute resolution meetings, if necessary. This technical support may include measurement plans or test protocols that appropriately measure and produce spectral occupation for analysis and M & S.

d. In Addition, JIEDDO shall:

(1) Be available and able to provide a forum for DOD organizations and other federal agencies to convene technical working groups, boards, information as necessary.

(2) Ensure technical and operational support through the JTB for all counter IED testing.

(3) Continue to facilitate the coordination and sharing of information in regard to current IED threats and operational EW considerations.

6. Joint Spectrum Center (JSC). The JSC shall provide a quality assurance (QA) of the requestor's M & S plots and associated files within 10 working days of MILDEP FMO notification that M & S plots are ready for review. If questions arise from JSC's QA, JSC will contact the requestor directly via SIPRNET e-mail or telecon. JSC and the requestor will advise the MILDEP FMO, AFC, etc of any changes to the original request package. The JSC will immediately notify the MILDEP FMO (and other agencies as required) once the plots are verified accurate and ready for analysis. The JSC QA will consist of, at minimum, the following review checks:

a. Accuracy of the transmitter coordinates and/or operating areas.

b. Accuracy of the transmitter technical specifications (i.e. antenna type, gain, transmitter power (to confirm accurate effective isotropic radiated power), waveform type, and transmitter bandwidth).

c. Accuracy of the data input including the FCC non-government systems and FAA's ATC receiver thresholds and FAA-required M & S parameters.

7. Coordination. The request package consists of two separate components. One is the EA request message submitted through the appropriate chain of command to the MILDEP FMO. The second consists of multiple M & S plots and associated data files, which must be provided both via secure means and as unclassified data files to JSC for QA checks as annotated in paragraph 6. The M & S plots provide a geographic and digital representation of potential interference.

a. Create and submit the RCIED request message using the process described in Enclosure C.

b. Submit the M & S plots and associated data files to support the interagency analysis (i.e. FAA and FCC).

8. CEASE BUZZER. These requests will adhere to CEASE BUZZER procedures as described in Enclosure H.

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ENCLOSURE E

EA COORDINATION FLOWCHARTS

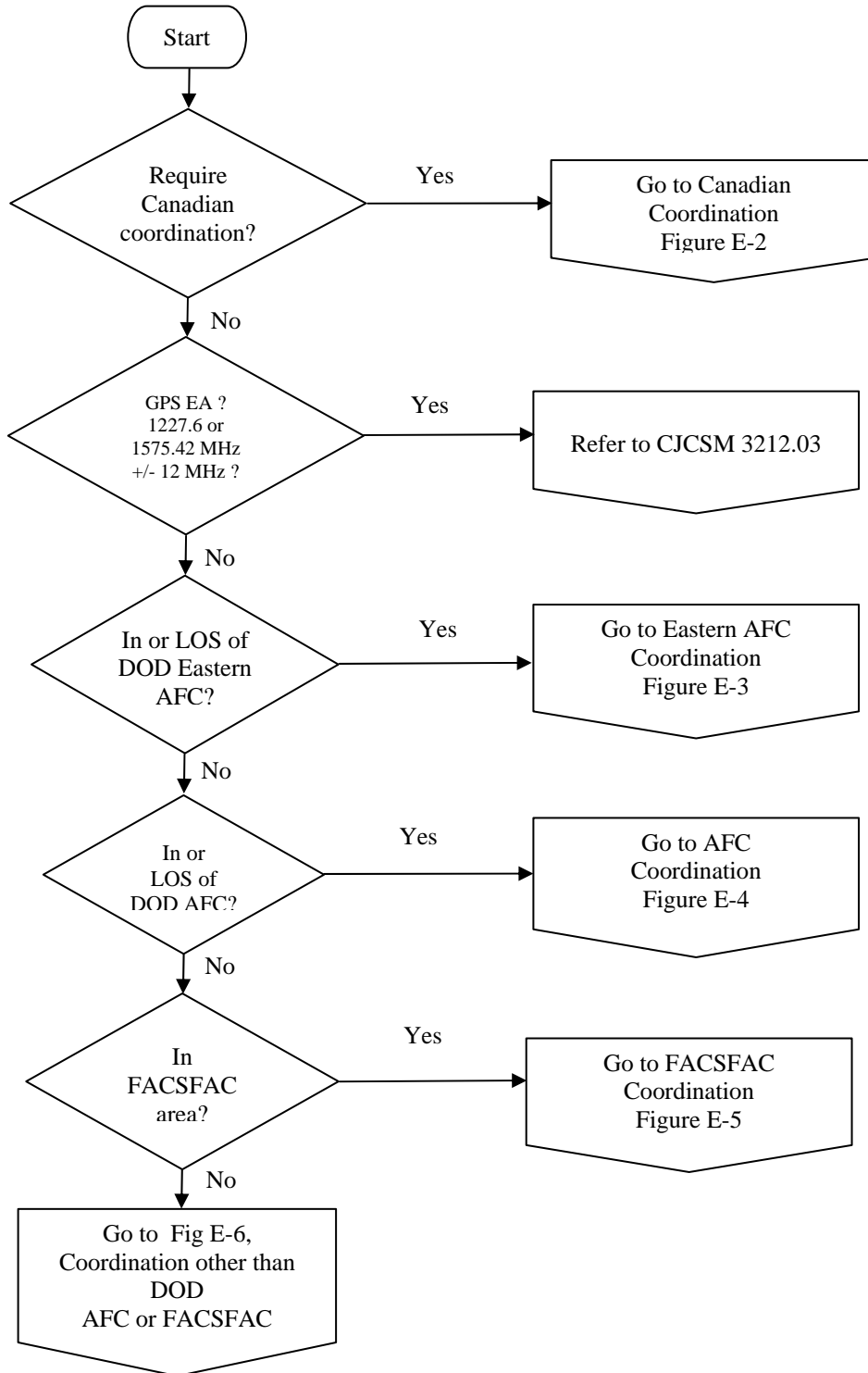
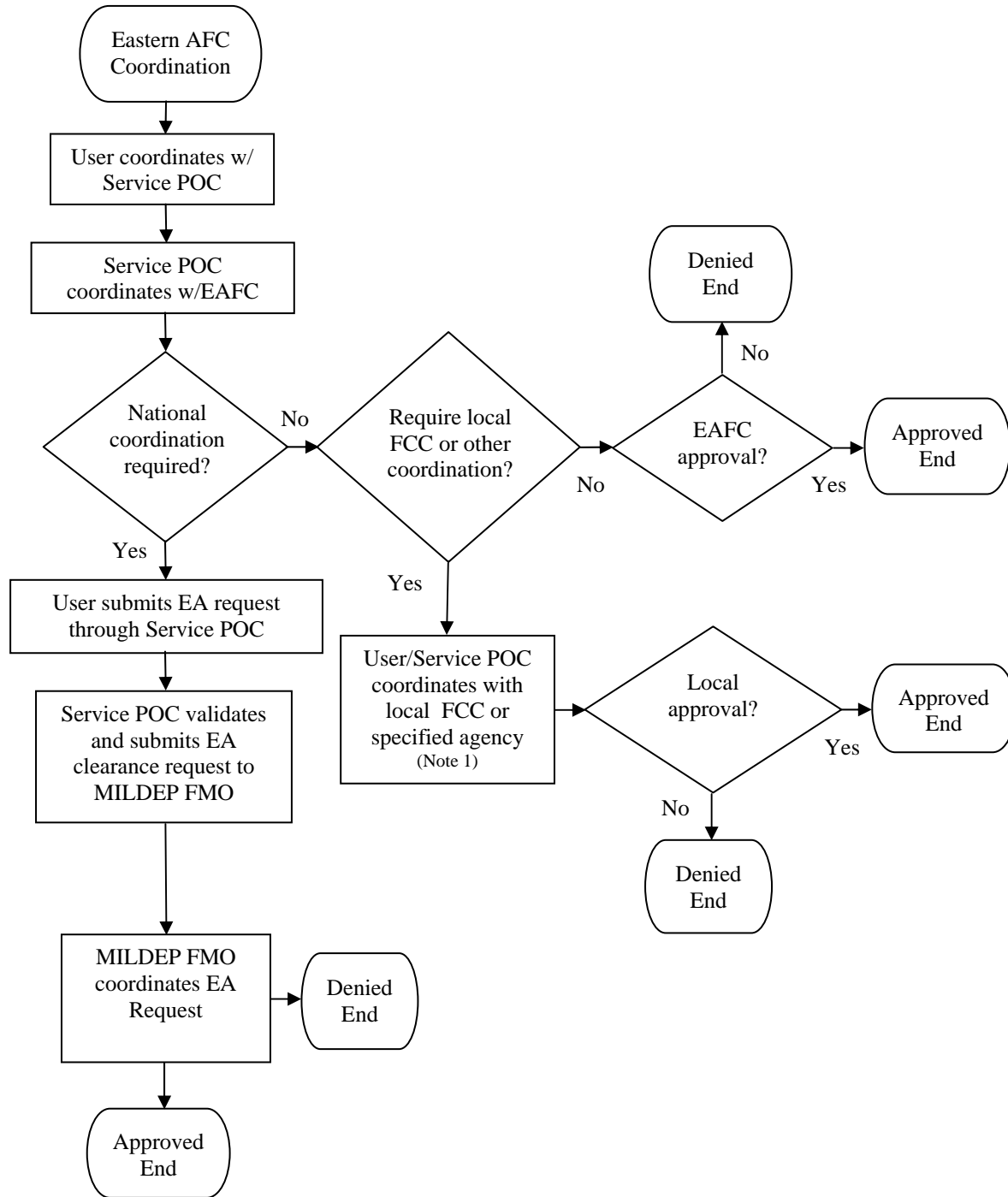
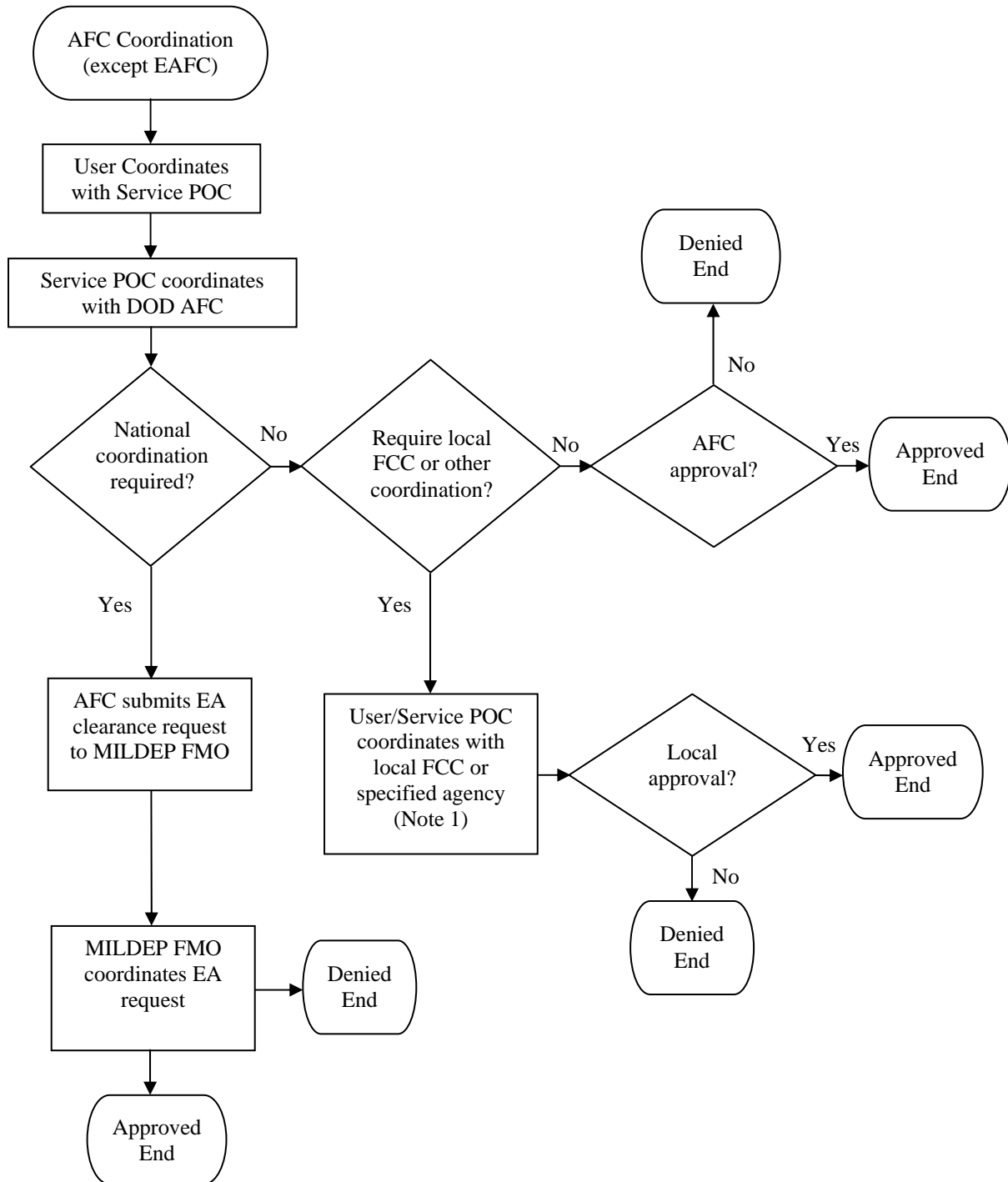


Figure 1. EA Coordination



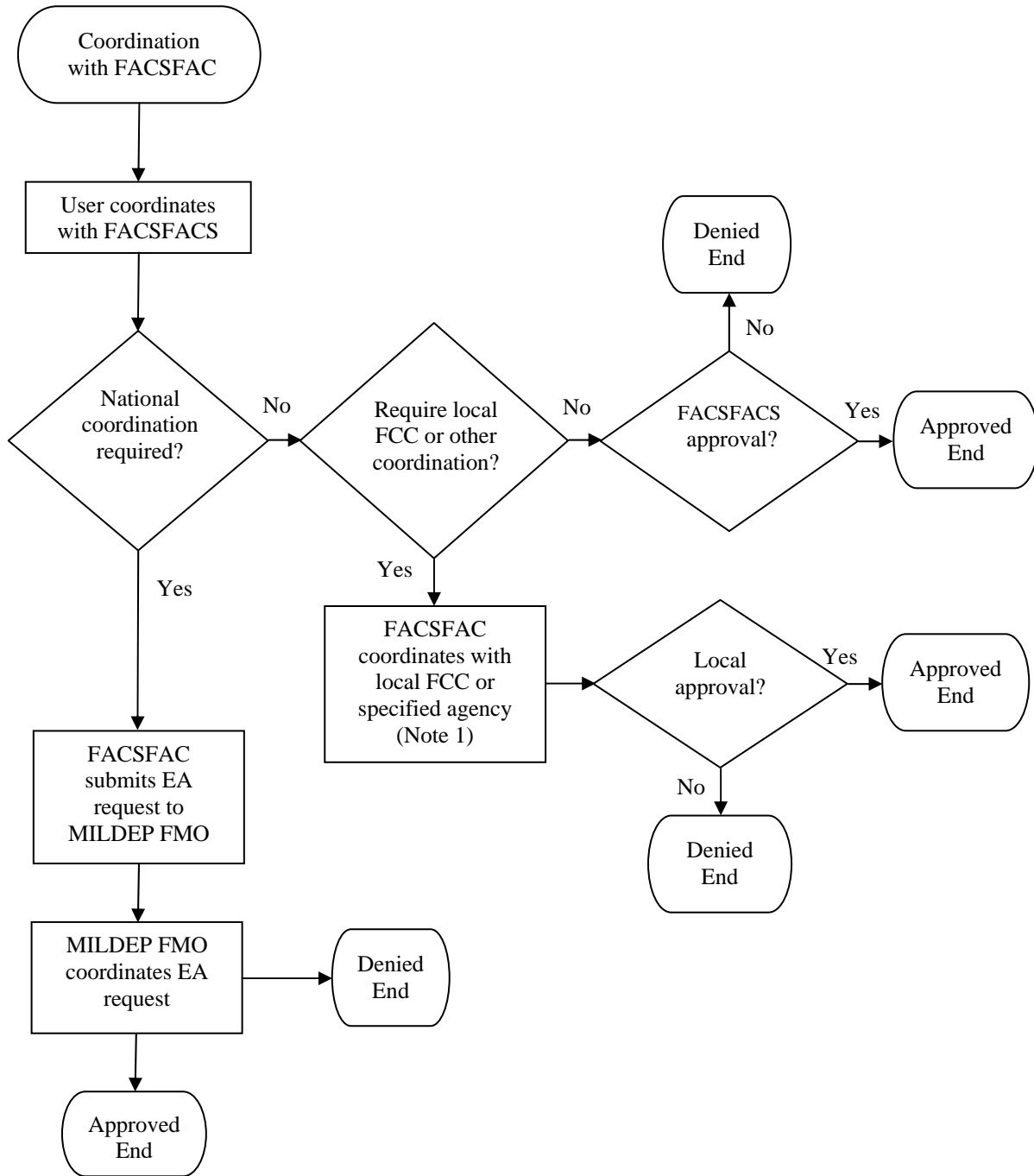
Note 1: FCC Watch officer (202) 418-1122

Figure 2. Eastern AFC Coordination



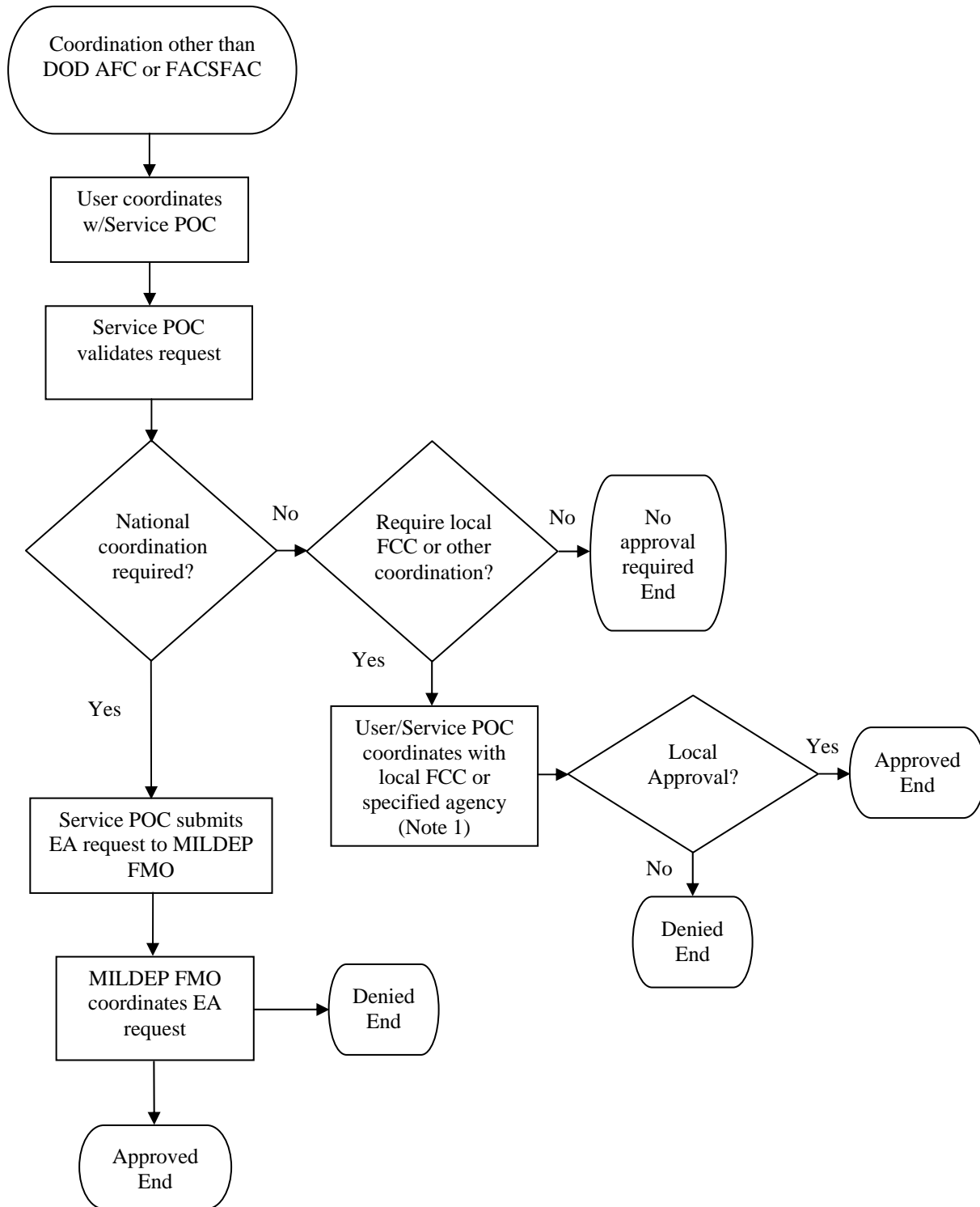
Note 1: FCC Watch Officer (202) 418-1122

Figure 3. AFC Coordination



Note 1: FCC Watch Officer (202) 418-1122

Figure 4. FACSFACTS Coordination



Note 1: FCC Watch Officer 202-418-1122

Figure 5. Coordination other than DOD AFC or FACSFAC

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ENCLOSURE F

OPSEC CONSIDERATIONS

OPSEC advisories are transmitted as messages from Service agencies (for example: USAF, AFSIRA, AFIOC). These advisories must be consulted, and Services must ensure a collection threat does not exist during times of EA transmissions of a classified nature. OPSEC considerations must be applied to EW tests, exercises, and training activities to minimize the disclosure of friendly capabilities while allowing for an effective training program across the spectrum of EW operations.

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ENCLOSURE G

EA FREQUENCY CLEARANCE NOTIFICATION

1. Office Responsible for EA Clearance Notification. EA frequency clearance approval notification will be issued by the MILDEP FMO not later than (NLT) 10 working days prior to the proposed start date.

2. Contents of EA Approval Clearance Notification. Approval notification will contain the following information:

a. Action Addressees. Service frequency coordinator and controlling agency that initiated request.

b. Subject. "EA Clearance Notification for National Frequencies."

c. Reference. EA clearance request control number.

d. Initiation and Expiration Dates

e. Area of Operation. Name of range, MOA, restricted area, warning area and coordinates and approved altitudes for airborne operations.

f. Hours. Weekly or daily operating hours, EA start/stop times (in UTC and local) and duration of EA in hours.

g. Frequencies Approved

(1) Buzzer. Bands, channels, or specific frequencies approved for jamming with BWs will be listed. Frequencies denied may be listed as well.

(2) Chaff. For burst or stream, frequency bands affected will be indicated. "NONE" will be indicated, if denied.

h. Remarks. Information on restrictions, distribution, and special procedures will be placed here. Include statement "CEASE BUZZER procedures will be in effect." List EA mission POC, telephone (DSN and commercial), and organization. If clearance approval notification does not provide specific dates and times, include the statement, "Note: EA notification message will be sent by operating unit to addressees as above, NLT 10 working days prior to EA operations. Reference this clearance approval notification, and state date and time EA will be conducted."

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3. In-Flight EA Notification

a. ARTCC, NORAD, and Range Controller Notification. Clearance requests, which have been approved at the national level, allow EW users to conduct air, land, or sea-based operations within the CONUS. Direct in-flight notification of EA activity to ARTCC, NORAD, and/or the range controller, which have jurisdiction over the areas where operations have been approved, is mandatory. No additional in-flight clearance requests for EA outside the planned training scenario should be attempted. Only EA activity previously approved may be conducted. The previously approved EA activity will be indicated on the flight plan (DD Form 175). The Cheyenne Mountain Operations Center (CMOC), Command Director (CD), as CDR NORAD/CDR USNORTHCOM representative, is authorized to direct the termination of any EA activity adversely affecting the ability to carry out the mission of the surveillance of air and space against an attack on North America. Additionally, agencies (air space managers and DOD AFC offices) having jurisdiction over airspace involved in EW activity can deny EW activity for safety-of-flight considerations or scheduling conflicts.

(1) Notification Information. Notify FAA, NORAD, and/or range controllers (as appropriate) of the following flight information to confirm EW activity:

(a) Aircraft call sign and flight level.

(b) FAA approval number (EW request number, e.g., 1ECRG90-4).

(c) Type of EW (electronic jamming “buzzer” or EA expendables (burst or stream chaff, active decoys, unattended jammers)).

(d) Frequency bands and channels affected (see Enclosure I for band designations).

(e) Location and duration of EW activity. NOTE: Chaff fall rate and wind factors are used to determine area of burst or stream activity.

(2) Frequency Band Designators. All references to RF bands for EA clearance purposes will use numeric designations in MHz. For example, “Center, buzzer three one two five megahertz through three three zero zero megahertz.” The entire list and a cross-reference graph to former designators are in Enclosure I.

(3) Notification of the EA activity must be relayed to the NORAD region/sector having jurisdiction over the involved airspace. EA activity will be coordinated with the applicable ARTCC. In CONUS when NORAD is not within radio range, aircrews must contact the ARTCC and request they notify NORAD

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of EA activity. In-flight EA notification must be accomplished at least 10 minutes before desired EA start time.

(4) In Canada, aircrews are to contact the Mission Crew Commander, North Bay, at telephone numbers (DSN) 319-628-6401(6402, 6404, or 6405) or commercial 705-494-6011, then local 6401 (6402, 6404, or 6405).

(5) Previously approved burst chaff drops will only be accomplished after final approval is received immediately preceding the drop, from the ARTCC, NORAD, and/or range controller having jurisdiction over the airspace.

(6) If approved EA activity is denied, the reason for denial will be given and treated as a CEASE BUZZER. Document appropriate information for reference.

b. NORAD Notification Procedures. For pre-approved EW clearance requests, if activity, will affect national frequencies within bands D-3, D-4, E-8, E-9, G-6, I-3, I-4, I-5, I-6, I-7, I-8, K-2, or K-3 (see Enclosure I); or if activity will affect FAA or NORAD joint-surveillance radars, NORAD will notify the applicable AFC when EW operations may impact operations in an EW geographic area of cognizance (see Enclosure M).

4. Clearance Notification. After validating the EA clearance notification received from the MILDEP FMO, the Service frequency coordinator will provide approval notification to the controlling agency making the request. The Service frequency coordinator will also send the EA clearance notification to the following as information addressees:

- a. CDR USNORTHCOM//J3/J6/J653/J7/JFMO//.
- b. CDR USJFCOM NORFOLK VA//J3/J6/J7// and JFMO LANT NORFOLK VA (for training/exercises conducted under USJFCOM auspices).
- c. Operating units as appropriate.
- d. CMOC CHEYENNE MOUNTAIN AFS CO//J3/J35/AWC/MWC/SCC//.
- e. DOD AFC (see Enclosure L).
- f. HQ FAA Washington DC/ASR-100 if applicable.
- g. FCC Washington DC/Frequency Liaison Branch, if applicable.
- h. National Weather Service, as appropriate.
- i. Appropriate FCC field operations office (see Enclosure J), if applicable.

- j. Appropriate FAA ARTCC, if applicable.
- k. FAA Regional FMO (see Enclosure K), if applicable.
- l. For Canadian clearances, refer to Enclosure C, subparagraph 4d.
- m. Appropriate NORAD regions/sectors that may be affected
- n. HQ USAF WASHINGTON DC//AF/A5RE//, and additionally for space-related operations:
AF/A3Z-SC, AF/A3Z-ST, AF/A3Z-SO.
- o. COGARD NAVCEN ALEXANDRIA VA//NIS// (for maritime operations).
- p. DISA JSC COMMCTR
- q. NATIONAL TELECOMMUNICATIONS AND INFORMATION
ADMINISTRATION WASHINGTON DC.
- r. AFFMA ALEXANDRIA VA//DOO//; (Note: AFFMA SIPRNET address is:
MLA-AFFMA-EW@affma.af.smil.mil).
- s. GPS SUPPORT CENTER SCHRIEVER AFB CO.
- t. NAVEMSCEN WASHINGTON DC//323//.
- u. ARMY SPECTRUM MGT ALEXANDRIA VA//NETC-EST-V//.

ENCLOSURE H

CEASE BUZZER/CEASE MUSIC PROCEDURES

1. CEASE BUZZER/CEASE MUSIC Procedures. When suspension of EW activity is required for safety-of-flight reasons, in cases of harmful interference to authorized users of the RF spectrum, or for OPSEC reasons, the following procedures will be used:

a. Communications Monitoring. During airborne EW, all EW aircraft must monitor the emergency guard frequency (either 121.5 or 243.0 MHz) continuously, in addition to the frequency designated for CEASE BUZZER requests.

b. Safety of Flight. Authorized users of the spectrum requesting CEASE BUZZER / CEASE MUSIC for safety-of-flight reasons will broadcast the request directly to the EW originator on the frequency in use or on an emergency guard frequency or will request CEASE BUZZER / CEASE MUSIC through the controlling agency or AFC via ground to air radio. Everyone else must contact Range Control or the AFC by phone for a CEASE BUZZER / CEASE MUSIC order. EW originator will immediately cease the EW activity and notify the requester of termination.

c. Other than Safety of Flight. Authorized users of the spectrum requesting CEASE BUZZER / CEASE MUSIC for other than safety-of-flight reasons will contact the appropriate controlling agency and provide identification, type of facility, RF bands involved, and duration of suspension. For example, "Boston Sector, this is Boston Center request CEASE BUZZER 2,200 megahertz through 2,300 megahertz for 5 minutes." The controlling agency will immediately pass the CEASE BUZZER request to the EW source relaying the appropriate information. For example, "Bounder 31 this is Boston Sector. CEASE BUZZER 2,200 megahertz through 2,300 megahertz for 5 minutes."

d. Reinstatement of EW. Facilities requesting suspension of EW will notify the controlling agency or EW originator when EW activity may be resumed.

e. Documentation. EW operators and controlling agencies, as appropriate, will log all pertinent information regarding the CEASE BUZZER / CEASE MUSIC request and compliance; i.e., time, RF bands, requester, time of reinstatement and method by which request was received. Logs will be retained in accordance with Service directives governing control logs.

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ENCLOSURE I

EW FREQUENCY BAND DESIGNATIONS

1. Operational Band and Channel Codes. The bands and channels listed in Table 3 are set up to give one standard system of frequency band designations for EW operations and to facilitate the operational control of EW. The bands are identified in alphabetical sequence. Each band is divided into 10 numerical channels. The phonetic alphabet and numerical channel numbers are used to identify the EW frequency. During operations, when it becomes necessary to identify an exact frequency, the frequency is specified as a numerical designation (lowest frequency in any channel) plus frequency in MHz above the base frequency. Example for 1315 MHz: DELTA 4 covers the frequency range 1,300-1,400 MHz; 1,315 MHz would therefore be designated DELTA 4 plus 15.

<u>Band</u>	<u>Frequency (MHz)</u>	<u>Channel Width (MHz)</u>
A(lpha)	0 - 250	25
B(ravo)	250 - 500	25
C(harlie)	500 - 1,000	50
D(elta)	1,000 - 2,000	100
E(cho)	2,000 - 3,000	100
F(oxtrot)	3,000 - 4,000	100
G(olf)	4,000 - 6,000	200
H(otel)	6,000 - 8,000	200
I(ndia)	8,000 - 10,000	200
J(uliet)	10,000 - 20,000	1,000
K(ilo)	20,000 - 40,000	2,000
L(ima)	40,000 - 60,000	2,000
M(ike)	60,000 - 100,000	4,000
N(ovember)	100,000 - 200,000	10,000
O(scar)	200,000 - 300,000	10,000

Table 3. EW Frequency Band Designations

2. EA Coordination Requirements by Frequency Band

a. Canada: All EA performed in Canada requires national coordination.

b. United States: Table 4 has been coordinated at the national level. The status of the frequency bands for EW in the United States is annotated below as “Local,” “Local (FCC),” or “National.” Each status is defined in the Glossary of this manual and in the procedures in Enclosure C.

c. National Coordination: In Table 4, “National” coordination requires the request be forwarded to the cognizant MILDEP FMO for coordination. The frequency bands are listed consecutively to include all frequencies for ease of understanding. Obviously, one frequency cannot be both national and local. Therefore, the following rules apply. All frequency bands designated national are inclusive. All “Local” or “Local (FCC)” frequencies adjacent to a national frequency band begin or end at the first increment adjacent to the national frequencies. Local (FCC) frequencies are inclusive when adjacent to a local frequency. For example, in the band 25-50 MHz, all frequencies from 25 MHz through 50 MHz require national coordination; frequencies 50.001 MHz through 53.999 MHz require local coordination; and frequencies 54MHz through 72.999 MHz require local (FCC) coordination. NOTE: The reallocation of federal RF spectrum is an ongoing process. Reallocation may affect testing in some of the spectrum bands listed in Table 4. The MILDEP FMOs have the latest information on spectrum reallocation actions and will factor this knowledge into the national coordination process.

Channel	(MHz)	United States
A-1	0-25	National
A-2	25-50	National
A-3	50-75.2 [50-54 54-73 73-75.2]	Local Local (FCC) National ¹
A-4	75.2-100 [75.2-75.4 75.4-100]	National Local (FCC)
A-5	100-125 [100-108 108-125]	Local (FCC) National ¹
A-6	125-150 [125-138 138-150]	National ¹ Local

Table 4 Coordination Level Required by Channel and Frequency

Channel	(MHz)	United States
A-7	150-175 [150-156 156-158 158-161 161-174 174-175]	Local National Local National Local (FCC)
A-8	175-200	Local (FCC)
A-9	200-225 [200-216 216-222 222-225]	Local (FCC) National Local
A-10	225-250 [225-242.5 242.5-243.5 243.5-250]	National ¹ National (Guard Frequency) ¹ National ¹
B-1	250-275	National ¹
B-2	275-300	National ¹
B-3	300-325	National ¹
B-4	325-350	National ¹
B-5	350-375	National ¹
B-6	375-400	National ¹
B-7	400-425 [400-420 420-425]	National Local
B-8	425-450 [425-448 448-450]	Local National
B-9	450-475	National
B-10	475-500	National
C-1	500-550 [500-512 512-550]	National ¹ Local (FCC)

Table 4 Coordination Level Required by Channel and Frequency (Continued)

Channel	(MHz)	United States
C-2	550-600	Local (FCC)
C-3	600-650 [600-608 608-614 614-650]	Local (FCC) National Local (FCC)
C-4	650-700	Local (FCC)
C-5	700-750	Local (FCC)
C-6	750-800	Local (FCC)
C-7	800-850 [800-806 806-850]	Local (FCC) National
C-8	850-900	National
C-9	900-950 [900-902 902-928 928-950]	National Local National ¹
C-10	950-1,000 [950-960 960-1000]	National National ¹
D-1	1,000-1,100	National ¹
D-2	1,100-1,200	National ¹
D-3	1,200-1,300	National ¹
D-4	1,300-1,400 [1,300-1,390 1,390-1,400]	National ¹ National
D-5	1,400-1,500	National ¹
D-6	1,500-1,600	National ¹
D-7	1,600-1,700	National ¹
D-8	1,700-1,800	National
D-9	1,800-1,900	National
D-10	1,900-2,000	National

Table 4 Coordination Level Required by Channel and Frequency (Continued)

Channel	(MHz)	United States
E-1	2,000-2,100	National
E-2	2,100-2,200	National
E-3	2,200-2,300	National
E-4	2,300-2,400 [2,300-2,305 2,305-2,390 2,390-2,400]	Local National Local
E-5	2,400-2,500 [2,400-2,483.5 2,483.5-2,500]	Local National
E-6	2,500-2,600	National
E-7	2,600-2,700	National
E-8	2,700-2,800	National ¹
E-9	2,800-2,900	National ¹
E-10	2,900-3,000	National
F-1	3,000-3,100	National
F-2	3,100-3,200	Local
F-3	3,200-3,300	Local
F-4	3,300-3,400	Local
F-5	3,400-3,500	Local
F-6	3,500-3,600	Local
F-7	3,600-3,700 [3,600-3,650 3,650-3,700]	Local National
F-8	3,700-3,800	National
F-9	3,800-3,900	National
F-10	3,900-4,000	National
G-1	4,000-4,200	National

Table 4 Coordination Level Required by Channel and Frequency (Continued)

Channel	(MHz)	United States
G-2	4,200-4,400	National ¹
G-3	4,400-4,600	Local
G-4	4,600-4,800 [4,600-4,635 4,635-4,685 4,685-4,800]	Local National Local
G-5	4,800-5,000 [4,800-4,990 4,990-5,000]	Local National
G-6	5,000-5,200	National ¹
G-7	5,200-5,400 [5,200-5,250 5,250-5,400]	National ¹ Local
G-8	5,400-5,600	Local
G-9	5,600-5,800 [5,600-5,650 5,650-5,800]	National ¹ Local
G-10	5,800-6,000 [5,800-5,850 5,850-6,000]	Local National
H-1	6,000-6,200	National
H-2	6,200-6,400	National
H-3	6,400-6,600	National
H-4	6,600-6,800	National
H-5	6,800-7,000	National
H-6	7,000-7,200	National
H-7	7,200-7,400	National
H-8	7,400-7,600	National
H-9	7,600-7,800	National
H-10	7,800-8,000	National

Table 4 Coordination Level Required by Channel and Frequency (Continued)

Channel	(MHz)	United States
I-1	8,000-8,200	National
I-2	8,200-8,400	National
I-3	8,400-8,600 [8,400-8,500 8,500-8,600]	National Local
I-4	8,600-8,800	Local
I-5	8,800-9,000	Local
I-6	9,000-9,200	National ¹
I-7	9,200-9,400 [9,200-9,300 9,300-9,400]	Local National
I-8	9,400-9,600 [9,400-9,500 9,500-9,600]	National Local
I-9	9,600-9,800	Local
I-10	9,800-10,000	Local
J-1	10,000-11,000 [10,000-10,550 10,550-11,000]	Local National
J-2	11,000-12,000 [11,000-11,700 11,700-12,000]	National Local (FCC)
J-3	12,000-13,000	Local (FCC)
J-4	13,000-14,000 [13,000-13,250 13,250-14,000]	Local (FCC) Local ²
J-5	14,000-15,000	National
J-6	15,000-16,000	National ¹
J-7	16,000-17,000	National ¹
J-8	17,000-18,000 [17,000-17,700 17,700-18,000]	National ¹ Local (FCC)

Table 4 Coordination Level Required by Channel and Frequency (Continued)

Channel	(MHz)	United States
J-9	18,000-19,000	Local (FCC)
J-10	19,000-20,000 [19,000-19,700 19,700-20,000]	Local (FCC) National
K-1	20,000-22,000	National
K-2	22,000-24,000	National
K-3	24,000-26,000 [24,000-24,050 24,050-26,000]	Local National
K-4	26,000-28,000 [26,000-27,500 27,500-28,000]	Local National
K-5	28,000-30,000	National
K-6	30,000-32,000 [30,000-31,300 31,300-31,800 31,800-32,000]	Local (FCC) National Local
K-7	32,000-34,000	Local
K-8	34,000-36,000	Local
K-9	36,000-38,000	National
K-10	38,000-40,000	National
L-1	40,000-42,000	National
L-2	42,000-44,000 [42,000-42,500 42,500-44,000]	National Local
L-3	44,000-46,000 [44,000-44,500 44,500-46,000]	Local National
L-4	46,000-48,000	National
L-5	48,000-50,000	National

Table 4 Coordination Level Required by Channel and Frequency (Continued)

Channel	(MHz)	United States
L-6	50,000-52,000 [50,000-51,400 51,400-52,000]	Local National
L-7	52,000-54,000	National
L-8	54,000-56,000	National
L-9	56,000-58,000)	National
L-10	58,000-60,000	National
M-1	60,000-64,000	Local
M-2	64,000-68,000	Local
M-3	68,000-72,000	Local
M-4	72,000-76,000	Local
M-5	76,000-80,000 [76,000-77,000 77,000-80,000]	National Local
M-6	80,000-84,000	Local
M-7	84,000-88,000 [84,000-86,000 86,000-88,000]	Local National
M-8	88,000-92,000	National
M-9	92,000-96,000	Local
M-10	96,000-100,000	Local
N-1	100,000-110,000 [100,000-100,200 100,200-102,000 102,000-105,000 105,000-110,000]	Local National Local National
N-2	110,000-120,000 [110,000-116,000 116,000-120,000]	National Local
N-3	120,000-130,000	Local

Table 4 Coordination Level Required by Channel and Frequency (Continued)

Channel	(MHz)	United States
N-4	130,000-140,000	Local
N-5	140,000-150,000	Local
N-6	150,000-160,000	Local
N-7	160,000-170,000 [160,000-164,000 164,000-168,000 168,000-170,000]	Local National Local
N-8	170,000-180,000	Local
N-9	180,000-190,000 [180,000-182,000 182,000-185,000 185,000-190,000]	Local National Local
N-10	190,000-200,000	Local
O-1	200,000-210,000	Local
O-2	210,000-220,000 [210,000-217,000 217,000-220,000]	Local National
O-3	220,000-230,000	Local
O-4	230,000-240,000 [230,000-231,000 231,000-240,000]	National Local
O-5	240,000-250,000	Local
O-6	250,000-260,000 [250,000-252,000 252,000-260,000]	National Local
O-7	260,000-270,000	Local
O-8	270,000-280,000	Local
O-9	280,000-290,000	Local
O-10	290,000-300,000	Local

Table 4. Coordination Level Required by Channel and Frequency

¹ FAA coordination required.

² Except that national coordination is required for the 13,750-14,000 MHz frequency band within 200 nm of the NASA site at Las Cruces, NM.

ENCLOSURE J

FCC FIELD OFFICES

NOTE: Local FCC offices and phone numbers are not listed. All local coordination is conducted through the FCC watch officer at (202) 418-1122. The watch officer will provide the appropriate local POC. EA notifications should also be faxed to the FCC watch officer at (202) 418-0908.

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ENCLOSURE K

FAA REGIONAL OFFICES AND AREAS OF RESPONSIBILITY

<u>Region</u>	<u>Address</u>	<u>Area of Responsibility</u>
Head- quarters	Federal Aviation Administration Spectrum Policy and Management, ASR-100 800 Independence Avenue, SW Washington, D.C. 20591 Phone: 202-267-9710 MSG ADD: FAA NATIONAL HQ WASHINGTON DC//ASR-100//	
Alaskan	Federal Aviation Administration Spectrum Management Office, AAL-470 222 West 7th Avenue, P.O. Box 14 Anchorage, AK 99513-7987 Phone: 907-271-5800/2238 MSG ADD: FAA ALASKAN RGN HQ ANCHORAGE AK//AAL-470/AAL-530//	Alaska
Central	Federal Aviation Administration Spectrum Management Office, ACE-474 901 Locust ATTN: ACE 474 Kansas City, MO 64106 Phone: 816-329-3466/3467 MSG ADD: FAA CENTRAL RGN HQ KANSAS CITY MO//ACE-474/ACE-530//	Iowa, Kansas, Missouri, and Nebraska
Eastern	Federal Aviation Administration Spectrum Management Office, AEW-472 One Aviation Plaza Jamaica, NY 11434-4809 Phone: 718-977-6608 MSG ADD: FAA EASTERN RGN HQ JAMAICA NY//AEA-483/AEA-530//	Delaware, D.C., Maryland, New Jersey, New York, Pennsylvania, Virginia, and West Virginia

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<u>Region</u>	<u>Address</u>	<u>Area of Responsibility</u>
Great Lakes	Federal Aviation Administration Spectrum Management Office, AGL-474B 2300 E. Devon Ave. Des Plaines, IL 60018 Phone: 847-294-8471 MSG ADD: FAA GREAT LAKES RGN HQ DES PLAINES IL//AGL-474B/AGL-530//	Illinois, Indiana, Michigan, Minnesota, North Dakota, South Dakota, Ohio, and Wisconsin
Hawaiian-Pacific	Federal Aviation Administration Spectrum Management Office, AWP-476 300 Ala Moana Blvd Rm 7-128 Honolulu, HI 96813 Phone: 808-541-1241 MSG ADD: FAA HONOLULU CERAP HONOLULU HI//AWP-476//	Hawaii and U.S. possessions in the Pacific Ocean
New England	Federal Aviation Administration Spectrum Management Office, ANE-471 12 New England Executive Park Burlington, MA 01803 Phone: 781-238-7490 MSG ADD: FAA NEW ENGLAND RGN HQ BURLINGTON MA//ANE-471/ANE-530//	Connecticut, Maine, Vermont, Massachusetts, New Hampshire, and Rhode Island
Northwest Mountain	Federal Aviation Administration Spectrum Management Office, ANM-473 1601 Lind Ave. SW Renton, WA 98055-4056 Phone: 206-227-2328 MSG ADD: FAA NORTHWEST MOUNTAIN RGN HQ SEATTLE WA//ANM-473/ANM-530//	Colorado, Idaho, Montana, Oregon, Utah, Washington, and Wyoming
Southern	Federal Aviation Administration Spectrum Management Office, ASO-473 P.O. Box 20636 Atlanta, GA 30320 Phone: 404-305-6672 MSG ADD: FAA SOUTHERN RGN HQ ATLANTA GA//ASO-483/ASO-530//	Alabama, Florida, Kentucky, Mississippi, North Carolina, Georgia, South Carolina, Tennessee, U.S. possessions in the Caribbean, Virgin Islands

<u>Region</u>	<u>Address</u>	<u>Area of Responsibility</u>
Southwest	Federal Aviation Administration Spectrum Management Office, ASW-473 2601 Meacham Blvd. Fort Worth, TX 76193-0473 Phone: 817-222-4762 MSG ADD: FAA SOUTHWEST RGN HQ FT WORTH TX//ASW-473/ASW-530//	Arkansas, New Mexico, Oklahoma, Texas, and Louisiana
Western Pacific	Federal Aviation Administration Spectrum Management Office, AWP-475 P.O. Box 92007 Worldway Postal Center Los Angeles, CA 90009-2007 Phone: 310-725-3475 MSG ADD: FAA WESTERN PACIFIC RGN HQ LOS ANGELES CA//AWP-475/AWP- 530//	Arizona, California, including off-shore islands, and Nevada

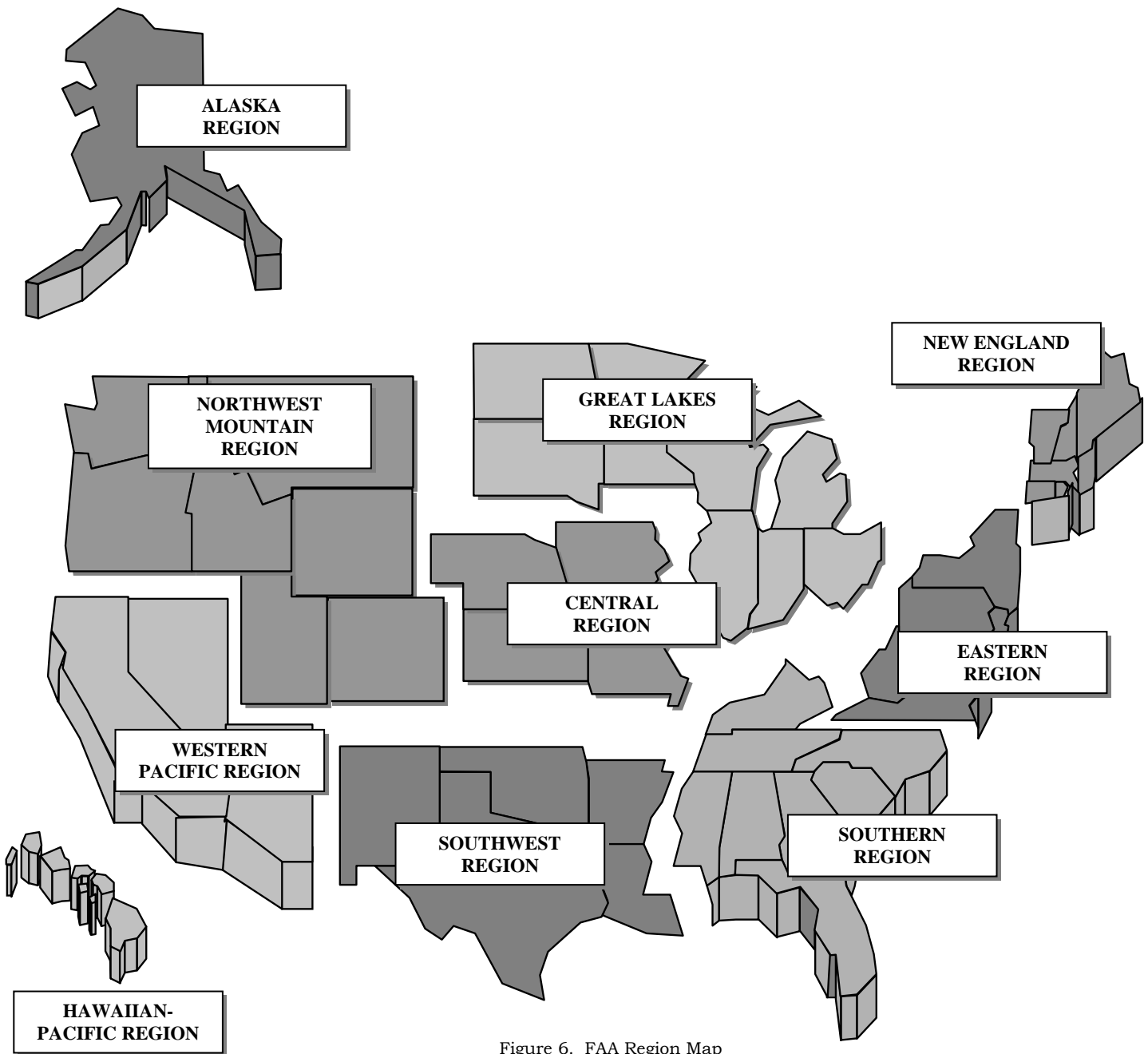


Figure 6. FAA Region Map

ENCLOSURE L

GEOGRAPHIC AREA OF COGNIZANCE/AGENCIES, DOD AREA FREQUENCY
COORDINATORS

1. EA Geographic Area of Cognizance. EW is strictly controlled within geographic areas in accordance with Joint Staff directives governing test and exercise ranges. Clearance to operate in these areas must be granted by the appropriate area frequency coordinator in addition to the coordination requirements of Enclosure C.

2. DOD Geographic Area of Cognizance and AFCs

<u>Geographic Area</u>	<u>Controlling Agency</u>
Alaska, including the Aleutian Island Chain.	Area Frequency Coordinator JFMO AK 9480 Pease Avenue, Suite 310 Elmendorf AFB, AK 99506-2100 DSN: 317-552-8223/7183 MSG ADD: RUHHHGA/ALCOM ELMENDORF AFB AK//J6//
Arizona	Area Frequency Coordinator ATTN: SFIS-FAC-SH Ft Huachuca, AZ 85613-5000 Tel: 602-538-6423 DSN: 879-6423 MSG ADD: DOD AFC AZ FT HUACHUCA AZ//SFIS-FAC-SH//
Colorado, west of 108°W; New Mexico; Utah, east of 111°; and Texas, west of 104°W.	Area Frequency Coordinator White Sands Missile Range, NM 88002-5526 Tel: 505-678-5417 DSN: 258-5417 MSG ADD: DOD AFC WHITE SANDS MISSILE RANGE NM//SFIS-FAC-SS//

Geographic Area

Controlling Agency

Florida, east of 83°W; and
Georgia, east of 83°W and
south of 31°30' N.

Eastern Area Frequency Coordinator
Patrick AFB, FL 32925-6345
Tel: 321-494-5837
DSN: 854-5837/5838
MSG ADD: DOD EAFC PATRICK AFB
FL

Puerto Rico, 200 nm radius of
18° 15'N, 65° 38'W (AFWTF,
Puerto Rico)

DOD Area Frequency Coordinator
Puerto Rico
CODE 096
PSC 1008, Box 3023
FPO AA 34051-9000
Tel: 809-865-5227/7001
DSN: 831-5227
MSG ADD: DOD AFC PR ROOSEVELT
ROADS PR

California, south of 37°30'N,
including all off-shore islands

Western Area Frequency Coordinator
Code 521700E
575 I Ave., Suite 1
Point Mugu, CA 93042-5049
Tel: 805-989-7983
DSN: 351-7983/7981
MSG ADD: WAFC PT MUGU CA

Alabama, south of 33°30'N;
Florida, west of 83°W; Georgia,
west of 83°W and south of
33°30'N; Louisiana, east of
90°W; and Mississippi, east of
90°W and south of 33°30'N.

Gulf Area Frequency Coordinator
201 W. Eglin Boulevard, Suite 206,
Eglin AFB, FL 32542-6829
Tel: 904-882-4416
DSN: 872-4416
MSG ADD: DOD GAFC EGLIN AFB FL

Geographic Area

Controlling Agency

Nevada; Utah, west of 111°W;
and Idaho, south of 44°N.

DOD Area Frequency Coordinator
Nellis AFB, NV 89191
Tel: 702-652-3417
DSN: 682-3417
MSG ADD: DOD AFC NELLIS AFB NV

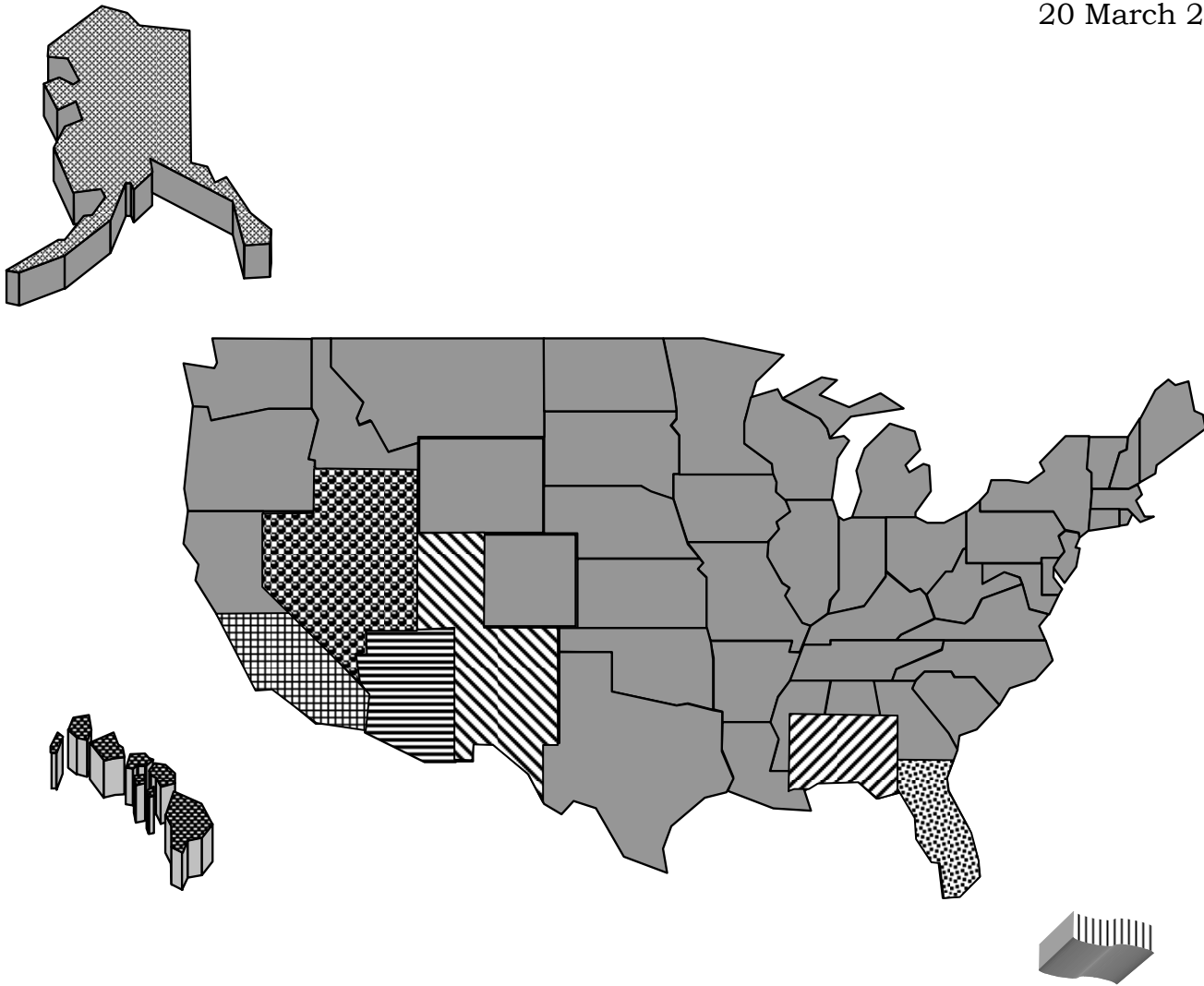
Hawaiian Islands and Guam,
200 nm radius outward from
the center of each island.

Oahu – 21°27'34"N,
157°59'54"W,
Kauai – 22°02'28"N,
159°29'03"W Maui –
20°42'59"N, 156°15'43"W
Hawaii – 19°40'03"N,
155°30'14"W. Guam –
13°33'54"N, 144°53'45"E.

Area Frequency Coordinator,
JFMO PAC
USPACOM J613, Box 64029 Camp H.
M. Smith, HI 96861-4029
Tel: 808-477-1051/50
DSN: 315-477-1051/50
AUTODIN MSG ADD: JFMO PAC
HONOLULU HI//J613//
DMS ADD: JFMOPAC (SC)
AUTODIN MSG ADD: JFMO GUAM
ISLAND GU//J613//
DMS ADD: JFMO GUAM ISLAND GU
(SC)

Kwajalein Atoll, 200 nm radius
outward from 08°43'07"N,
167°43'52"E.

DOD Area Frequency Coordinator
Kwajalein
U.S. ARMY KWAJALEIN
ATOLL\REAGAN TEST SITE (RTS)
PO Box 1706
APO AP 96555
Tel: 805-335-2953
DSN: 315-254-2953
AUTODIN MSG ADD: DOD AFC
KWAJALEIN MH
DMS ADD: KWAJALEIN USAKA DOD
AFC

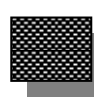


 DOD AFC WESTERN AREA (WAFC)

 DOD AFC NELLIS

 DOD AFC FT HUACHUCA

 JFMO ALASKA

 JFMO PACIFIC
(Guam not depicted)

 DOD AFC WHITE SANDS
MISSILE RANGE (WSMR)

 DOD AFC GULF AREA
(GAFC)

 DOD AFC EASTERN AREA
(EAFC)

 DOD AFC PUERTO RICO

 DOD AFC Kwajalein Atoll
(not depicted)

Figure 7. Map of Geographic Areas

ENCLOSURE M

NORAD EA COORDINATION ADDRESSES

<u>NORAD Regions/Sectors</u>	<u>Message Address</u>
Alaskan NORAD Region (ANR)	ANR ELMENDORF AFB AK//DO/DOC//
Canadian NORAD Region (CANR)	1 CAD/CANR//DCR/A3//
CONUS NORAD Region (CONR)	CONR TYNDALL AFB FL//DO/DOC//
Eastern Air Defense Sector (EADS)	EAST AIR DEFENSE SECTOR ROME NY//DO/DOC//
Western Air Defense Sector (WADS)	WESTERN AIR DEFENSE SECTOR MCCHORD AFB WA//DO/DOC//

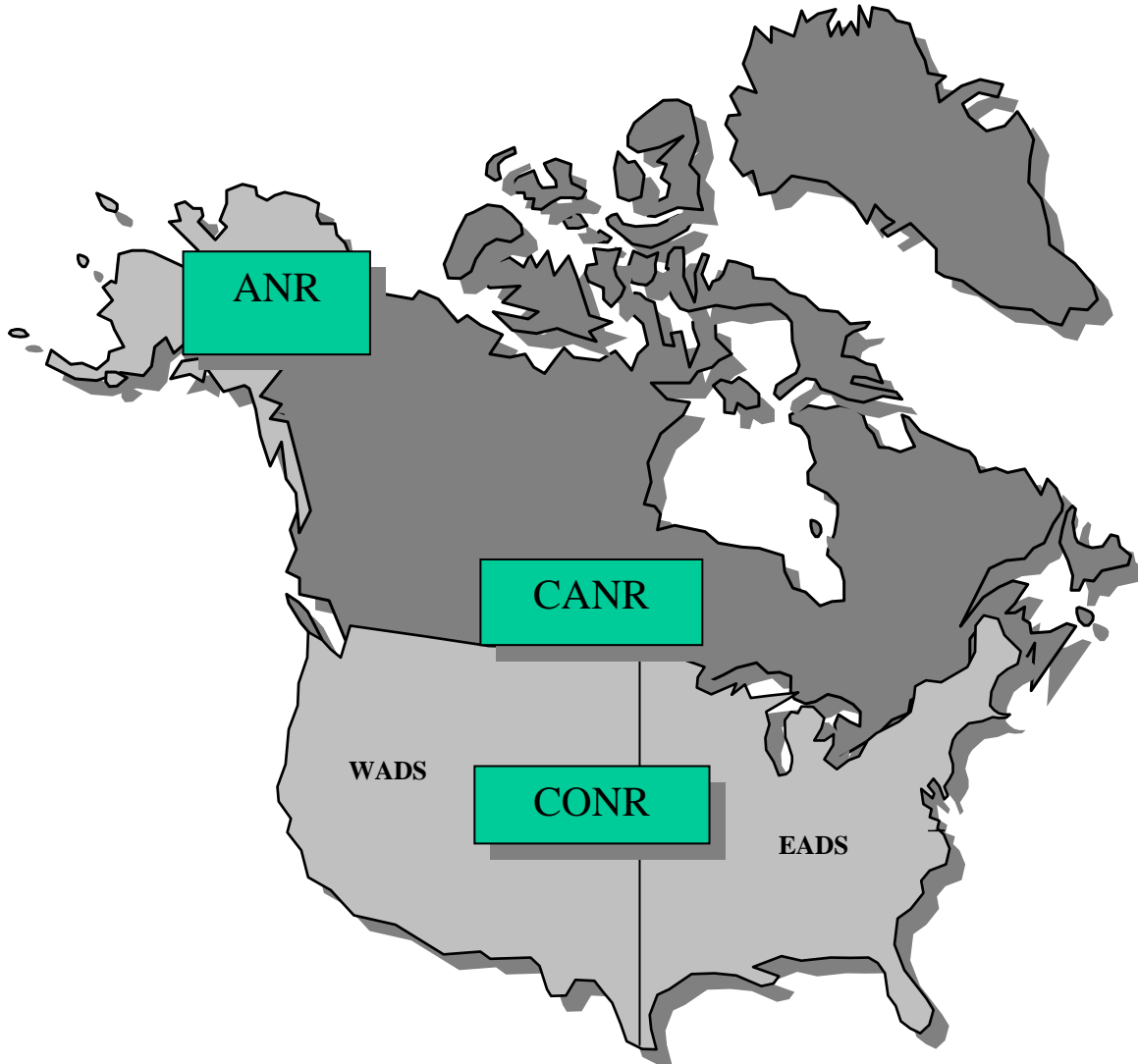


Figure 8. Map of NORAD Regions and Sectors

ENCLOSURE N

REFERENCES

- a. Communications Act of 1934, Pub. L. No. 416, ch. 652; 48 Stat. 1064, (1934); Chapter 5 47 U.S.C. § 151 et seq; as amended by the Telecommunications Act of 1996
- b. CJCSI 3210.03 Series, “Joint EW Policy”
- c. “CJCS Directives Electronic Library,” Information Management Division, 21 December 2010, <http://www.dtic.mil/cjcs_directives> (accessed: January 5, 2010)
- d. Federal Aviation Act of 1958, Pub. L. No. 85-726, 72 Stat. 731, (1958); Chapter 1 49 U.S.C. § 106 et seq, as amended
- e. “International Telecommunication Union,” Radio Regulations, <<http://www.itu.int/publ/R-REG-RR/en>> (accessed: January 18, 2010)
- f. National Environmental Policy Act of 1969, Pub. L. No. 91-190, 83 Stat. 852 (1969); Chapter 55 42 U.S.C. § 4321 et seq.
- g. Federal Aviation Administration Order JO 7610.4G, and 7610.11, and Range Regulation MSD 55-3.
- h. DODD 5200.1-R, 14 January 1997, (certified current as of 24 November 2003) “Information Security Program”
- i. OPNAVINST S5513.8B-88, “JOINT COUNTER RADIO CONTROLLED IMPROVISED EXPLOSIVE DEVICE ELECTRONIC WARFARE (CREW) PROGRAM SECURITY CLASSIFICATION GUIDE,” Rev 1, 2 April 2007

SUPPORTING DOCUMENTS

DODD 3222.3, 4 September 2004 “Electromagnetic Environmental Effects Program

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GLOSSARY

PART I -- ABBREVIATIONS/ACRONYMS

<u>ABBREVIATION</u>	<u>Phrase</u>
ADIZ	Air Defense Identification Zone
AFB	Air Force Base
AFC	area frequency coordinator
AFFMA	Air Force Frequency Management Agency
AFIOC	Air Force Information Operations Center
AFWTF	Atlantic Fleet Weapons Training Facility
AGL	above ground level
ANR	Alaskan NORAD Region
AOR	area of responsibility
ARTCC	Air Route Traffic Control Center
ATC	air traffic control
BMW	Beamwidth
BW	Bandwidth
CANR	CONUS NORAD Region
CD	command director
CDR	Commander
CJCSI	Chairman of the Joint Chiefs of Staff instruction
CJCSM	Chairman of the Joint Chiefs of Staff manual
CMOC	Cheyenne Mountain Operations Center
COCOM	Combatant Commander
CONR	CONUS NORAD Region
CONUS	continental United States
CREW	Counter RCIED Electronic Warfare
dB	Decibel
dBm	decibels referenced to one milliwatt
DDGO	Deputy Director for Global Operations (Joint Staff J3 deputy directorate)
DDIO	Deputy Director for Information Operations (Joint Staff J3 deputy directorate)
DE	directed energy
DEW	directed energy warfare
DTSES 5	Director, Telecommunications and Spectrum Engineering Support 5 (Canadian MILDEP FMO)
DOD	Department of Defense
DOD AFC	Department of Defense area frequency coordinator

<u>ABBREVIATION</u>	<u>Phrase</u>
DODD	Department of Defense directive
DMS	Defense Message System
DSN	Defense Switched Network
DOT	Department of Transportation
EA	electronic attack
EADS	Eastern Air Defense Sector
EAFCC	eastern area frequency coordinator
ECM	electronic countermeasures
EMI	electromagnetic interference
EP	electronic protect
ES	electronic warfare support
EW	electronic warfare
FAA	Federal Aviation Administration
FACSFAC	fleet area coordination and surveillance facility
FCC	Federal Communications Commission
FMO	frequency management office
GHz	Gigahertz
GPS	global positioning system
GPSSC	GPS support center
HQ	Headquarters
IAW	in accordance with
ICAO	International Civil Aviation Organization
IRAC	Interdepartmental Radio Advisory Committee
ISM	Installation Spectrum Manager
ITU	International Telecommunications Union
JFCOM	Joint Forces Command
JFMO	Joint Frequency Management Office
JSC	Joint Spectrum Center
kHz	Kilohertz
LAT	Latitude
LONG	Longitude
LOS	line of sight
MHz	Megahertz
MILDEP	Military Department
MOA	Military Operating Area
MSL	mean sea level

<u>ABBREVIATION</u>	<u>Phrase</u>
NAVCAN	A private, nonprofit agency responsible for the management and operation of the Canadian National Air Traffic Control System. Transport Canada retains responsibility for policy, etc.
NAVCEN	navigation center
NAVMARSPECCEN	Navy Marine Corps Spectrum Center
NDHQ	National Defence Headquarters (Canada)
NEPA	National Environmental Policy Act
NLT	not later than
nm	nautical miles
NORAD	North American Aerospace Defense Command
NTIA	National Telecommunications and Information Administration
OPSEC	operations security
POC	point of contact
PWR	Power
RCIED	Radio-controlled improvised explosive device
RF	radio frequency
SOCAL	Southern California Operating Area
US&P	United States and Possessions
USA	U.S. Army
USAF	U.S. Air Force
USCENTCOM	United States Central Command
USJFCOM	United States Joint Forces Command
USMC	U.S. Marine Corps
USN	U.S. Navy
USNORTHCOM	United States Northern Command
USPACOM	United States Pacific Command
USSOCOM	United States Special Operations Command
USSOUTHCOM	United States Southern Command
USSTRATCOM	United States Strategic Command
UTC	Coordinated Universal Time
VACAPES	Virginia Capes Operating Area
VFR	visual flight rules
VHF	very high frequency
WADS	Western Air Defense Sector

PART II -- DEFINITIONS¹

Airborne EA. All types of electronic jamming, electronic deception, or the use of EA expendables including chaff, flares, unmanned vehicles, decoys, and unattended jammers dispensed by aircraft or other vehicles during flight.

Barrage Jamming. Simultaneous electromagnetic jamming over a broad band of frequencies. (Joint Pub 1-02)

Big Photo. A general call sign used to contact aircraft performing airborne EA.

Burst. Chaff dropped with a separation (time interval) great enough to appear on a radarscope as individual target returns.

Buzzer. Electronic noise jamming or deception.

Canada. For purposes of this manual, Canada includes the 10 Provinces; the Yukon; the Northwest and Nunavut; the Arctic Islands and surrounding waters; the area extending to the outer boundaries of the Atlantic and Pacific Canadian Air Defense Identification Zone (ADIZ); and the Northern Domestic Airspace; or a perimeter 200 nm seaward from the coastal provinces and territories, whichever is further out, except where this infringes on territorial limits of other nations or states.

Cease Buzzer/Music. Unclassified term used to terminate EA activities, including the use of EW expendables. CEASE BUZZER is used to cease jamming communications and CEASE MUSIC refers to stopping radar jamming.

Chaff. Radar confusion reflectors, consisting of thin, narrow metallic strips of various lengths and frequency responses, which are used to reflect echoes for confusion purposes. Causes enemy radar guided missiles to lock onto it instead of the real aircraft, ship, or other platform. (Joint Pub 1-02)

Directed Energy. Also called DE. An umbrella term covering technologies relating to the production of a beam of concentrated electromagnetic energy or atomic or subatomic particles. (Joint Pub 1-02)

Directed-Energy Warfare. Also called DEW. Military action involving the use of directed-energy weapons, devices, and countermeasures to either cause direct damage or destruction of enemy equipment, facilities, and personnel, or to determine, exploit, reduce, or prevent hostile use of the EMS through damage, destruction, and disruption. It also includes actions taken to protect

¹ Used only in context with this manual unless otherwise denoted.

friendly equipment, facilities, and personnel, and retain friendly use of the EMS. (Joint Pub 1-02)

Directed-Energy Weapon. A system using directed energy primarily as a direct means to damage or destroy enemy equipment, facilities, and personnel. (Joint Pub 1-02)

Electromagnetic Deception. The deliberate radiation, re-radiation, alteration, suppression, absorption, denial, enhancement, or reflection of electromagnetic energy in a manner intended to convey misleading information to an enemy or to enemy electromagnetic-dependent weapons, thereby degrading or neutralizing the enemy's combat capability. Among the types of electromagnetic deception are:

a. **Imitative Electromagnetic Deception.** The introduction of electromagnetic energy into enemy systems that imitate enemy emissions.

b. **Manipulative Electromagnetic Deception.** Actions to eliminate revealing, or convey misleading, electromagnetic telltale indicators that may be used by hostile forces.

c. **Simulative Electromagnetic Deception.** Actions to simulate friendly, notional, or actual capabilities to mislead hostile forces.

Electromagnetic Interference. Also called 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 EW, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and the like. (Joint Pub 1-02)

Electromagnetic Intrusion. The intentional insertion of electromagnetic energy into transmission paths in any manner with the objective of deceiving operators or causing confusion. (Joint Pub 1-02)

Electromagnetic Jamming. The deliberate radiation, re-radiation, or reflection of electromagnetic energy for the purpose of preventing or reducing an enemy's effective use of the EMS with the intent of degrading or neutralizing the enemy's combat capability. (Joint Pub 1-02)

Electromagnetic Spectrum. The range of frequencies of electromagnetic radiation from zero to infinity. It is divided into 26 alphabetically designated bands. (Joint Pub 1-02)

Electronic Attack. Also called EA. A subdivision of EW involving the use of electromagnetic, directed energy or antiradiation weapons to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability. EA includes:

a. Actions taken to prevent or reduce an enemy's effective use of the EMS, such as jamming and electromagnetic deception.

b. Employment of weapons using either electromagnetic or directed energy as their primary destructive mechanism (lasers, RF weapons, particle beams) or anti-radiation weapons.

Electronic Attack Expendables. Nonrecoverable EA devices such as chaff, flares, unmanned vehicles, decoys, and unattended jammers.

Electronic Attack Frequency Clearance. Authorization to conduct EW in a specific area on designated frequencies and under specific conditions and parameters.

Electronic Attack Frequency Deconfliction. Actions taken to predict and protect potential users who could be impacted by proposed EA.

Electronic Attack Planning Factors. Information required when submitting a formal clearance request. Factors address the environment (airspace and topography), parameters of the EA transmissions, timing, and scope of test or training.

Electronic Masking. The controlled radiation of electromagnetic energy on friendly frequencies in a manner to protect the emissions of friendly communications and electronic systems against enemy electronic support measures/signals intelligence without significantly degrading the operation of friendly systems. (Joint Pub 1-02)

Electronic Protection. Also called EP. A subdivision of EW involving passive and active means taken to protect personnel, facilities, and equipment from any effects of friendly or enemy employment of EW that degrade, neutralize, or destroy friendly combat capability. (Joint Pub 1-02)

Electronic Warfare. Also called EW. Any military action involving the use of electromagnetic and directed energy to control the EMS or to attack the enemy. The three major subdivisions within EW are: EA, EP, and ES. (Joint Pub 1-02)

Electronic Warfare Support. Also called ES. A division of EW involving actions tasked by, or under direct control of, an operational commander to search for, intercept, identify, and locate or localize sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate

threat recognition, targeting, planning, and conduct of future operations. Thus, ES provides information required for decisions involving EW operations and other tactical actions such as threat warning, avoidance, targeting, and homing. ES data can be used to produce signals intelligence, provide targeting for electronic or destructive attack, and produce measurement and signature intelligence. (Joint Pub 1-02.)

Ground Photo. A general call sign for surface sites actively performing EA.

Harmful Interference. Interference that endangers the functioning of a radio navigation service or of other safety services, or seriously degrades, obstructs, or repeatedly interrupts a radio communication service. (NTIA Manual of Regulations and Procedures for Federal RF Management.)

In-Flight EA Notification. Notification provided in-flight to ARTCC, NORAD, and/or the range controller prior to initiating EA activities previously approved.

In-Flight EA Request. In-flight requests are no longer authorized. See Enclosure G for in-flight notification procedures.

Local Coordination. Frequency coordination where an EA clearance request to the national level is not required. However, coordination must be accomplished with the appropriate DOD AFC or FACSFC if EA is conducted in or within LOS of that DOD AFC or FACSFC area (see Enclosure L). EA requests for EA operations not within or in LOS of a DOD AFC or FACSFC must be coordinated through a Service POC familiar with local EA restrictions.

Local (FCC) Coordination. Frequency coordination conducted with the FCC regional representative. Cleared for EA use in the United States after FCC regional coordination. An EA clearance request to the national level is not required; however, coordination must be accomplished with the appropriate DOD AFC/FACSFC if EA is conducted within or in LOS of a DOD AFC/FACSFC (see Enclosure L). NOTE: All Canadian EA operations require submission of an EA clearance request IAW Enclosure C.

Military Department (MILDEP) Frequency Management Office (FMO). Army Communications-Electronic Services Office, Naval Electromagnetic Spectrum Center, and Air Force Frequency Management Agency.

Military Frequency Coordinator. The DOD AFC, Army FMO CONUS, Naval AFC, and Air Force major command FMO.

National Coordination. Frequency coordination requiring national (FAA, FCC, Department of State, and other agencies) coordination with a Service FMO. An

EA clearance request IAW Enclosure C is required. NOTE: All Canadian EA operations require submission of an EA clearance request IAW Enclosure C.

Rope Chaff. An element of chaff consisting of a long roll of metallic foil or wire, which is designed for broad, low-frequency response. (Joint Pub 1-02)

Routine EA Operations. Frequently recurring training or EA equipment checks using EW equipment with standardized times, and/or procedures in an approved area.

Service Pocs. Service POCs are familiar with the EA coordination process as well as local EA coordination issues. These POCs vary between Services and geographical areas and are not listed in this manual. EA users who are not aware of the proper Service POC to use in the EA coordination process should contact their MILDEP FMO for that information.

Special EA Operations. Tests and/or training, which are conducted on other than a frequent recurring basis and may require a planning conference or coordination of operating areas, times, and/or procedures.

Spot Jamming. The jamming of a specific channel or frequency. (Joint Pub 1-02)

Stream. Dispensing of chaff (solid/random interval/burst) at short intervals over an extended period of time and appearing on a radar scope as a continuous line of interference.

Surface EA. All types of electronic jamming, electronic deception, or chaff dispensing done by ground-based or shipboard equipment.

Sweep Jamming. A narrow band of jamming that is swept back and forth over a relatively wide operating band of frequencies. (Joint Pub 1-02)

United States And Possessions (US&P). Includes CONUS area, Alaskan area, Hawaiian area, island of Guam area, and Puerto Rican island area as explained below.

a. **Alaska Area.** The landmass of Alaska, including the Aleutian Chain, plus the area extending to the outer boundaries of the Alaskan Coastal ADIZ.

b. **CONUS Area.** The 48 states and the District of Columbia, plus the area extending to the outer boundaries of the coastal ADIZ or a perimeter 200 nm seaward from the coastal states, whichever is further out, except where this infringes on territorial limits of other nations.

c. **Guam Area.** The area within a 200-nm radius of 13°33'54"N, 144°53'45"E (Andersen AFB, Guam).

d. **Hawaii Area.** The area within a 200-nm radius of the center of each island.

Hawaii – 19°40'03"N, 155°30'14"W

Kauai – 22°02'28"N, 159°29'03"W

Maui – 20°42'59"N, 156°15'43"W

Oahu – 21°27'34"N, 157°59'54"W

e. **Kwajalein Atoll Area.** The area within a 200-nm radius of 08°43'07"N, 167°43'52"E Reagan Test Site (RTS). Includes Wake Island, located 1,100 kilometers north of the Kwajalein Atoll, is a functional adjunct to RTS, providing a launch site for intermediate range NMD and TMD target missiles. Program requirements, mission planning and implementation, and logistics support are coordinated through the RTS.

f. **Puerto Rico Operating Area.** The area within a 200-nm radius of 18°15'N, 65°38'W (Atlantic Fleet Weapons Training Facility, Roosevelt Roads, Puerto Rico). For naval operations: Commander Naval Forces Caribbean Instruction 3430.1 applies for EA operations in the Caribbean.

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