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MILITARY SPECTRUM MANAGEMENT

ABOUT THIS PRESENTATION

- These slides provide a broad overview of United States military spectrum management.
- They are intended for basic familiarity and should not be used as an authoritative source.
- Specific questions about military spectrum management should be directed to the appropriate military **I**nterdepartment **R**adio **A**dvisory **C**ommittee (IRAC) representative.

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STATISTICS

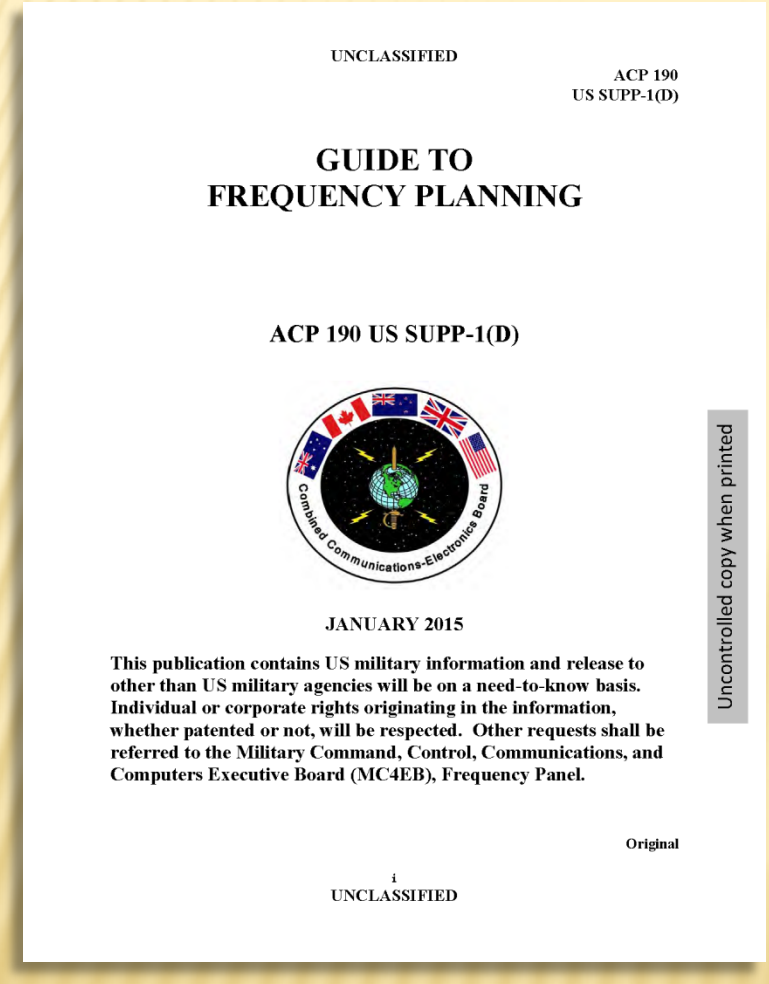
- Within the United States of America, the Military Departments of the Army, Navy, and Air Force combined use over 90,000 radio frequency assignments, accounting for over 1/3 of total Federal spectrum usage.
- A large scale United States military deployment can use over 50,000 unique radio frequencies.
- Relocating a single United States Navy aircraft carrier, along with its associated support vessels, is the spectrum equivalent of moving a city of 100,000, including an airport.

MILITARY SPECTRUM WITHIN THE UNITED STATES

The United States military uses extensive sharing. There are no frequency bands allocated specifically for exclusive military use.

POLICY

ACP 190 US SUPP-1(D), "GUIDE TO FREQUENCY PLANNING"



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ACP 190
US SUPP-1(D)

GUIDE TO
FREQUENCY PLANNING

ACP 190 US SUPP-1(D)

Combined Communications-Electronics Board

JANUARY 2015

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- Developed under the direction of the Joint Chiefs of Staff.
- Promulgated as guidance, information, and procedures to be used by the Armed Forces of the United States of America.

US GOVERNMENT POLICY

- United States Federal agencies planning the use of, conducting experiments relating to, or developing and procuring spectrum-dependent systems shall take all reasonable measures to ensure that such systems will neither cause nor receive harmful interference to or from other authorized users when placed in their intended operational environments.

- Office of Management and Budget Circular A-11 section “Preparation and Submission of Budget Estimates” requires United States Federal agencies to “obtain a certification by NTIA of the Department of Commerce, or their agency as designated by NTIA, that the radio frequencies required can be made available before submitting estimates for the development or procurement of major spectrum-dependent systems (including all systems employing space satellite techniques).”

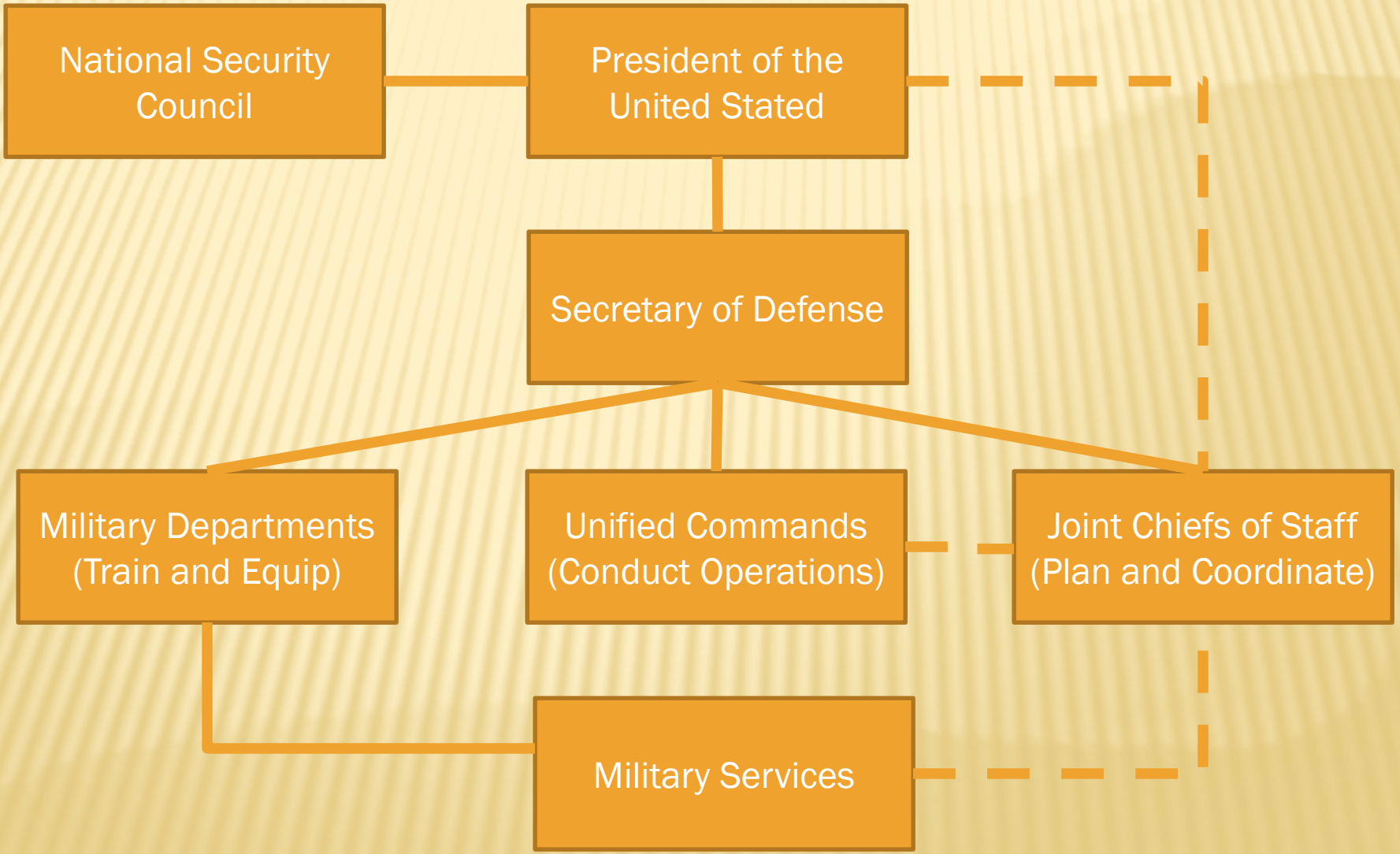
DOD POLICY

- Comply with International, United States, Department of Defense, and foreign Host Nation spectrum regulations and obtain applicable authorizations before operating spectrum-dependent systems.
- Obtain Joint Chiefs of Staff, Military Command, Control, Communications, and Computers (C4) Executive Board (MC4EB) Frequency Panel (FP) guidance.
- Obtain both United States and foreign host nation national-level certifications before assuming contractual obligations for the full-scale development, production, or procurement of any spectrum-dependent system.
  - United States and foreign host nation coordination processes are not necessarily sequential and may be initiated simultaneously.

UNITED STATES MILITARY AUTHORITY

- Posse Comitatus Act:
  - The primary Federal Statue (US Code 10 – 1385) that restricts military support to civilian enforcement agencies.
- Title 10/Armed Forces:
  - When in a Title 10 status, National Guard personnel are federally funded and under Federal command and control; consequently, they are subject to the Posse Comitatus Act.
- Title 14/US Coast Guard:
  - The Posse Comitatus Act does not apply to the US Coast Guard except during time of war when under the command and control of the Navy.
- Title 32/National Guard:
  - When in Title 32 status, National Guard personnel are federally funded and typically perform training for their Federal mission, but remain under control of the State. Although federally funded, because National Guard members in a Title 32 status fall under State control, they do not fall under Posse Comitatus Act restrictions and may perform those law enforcement duties authorized by State law.

UNITED STATES MILITARY STRUCTURE



RESPONSIBILITIES

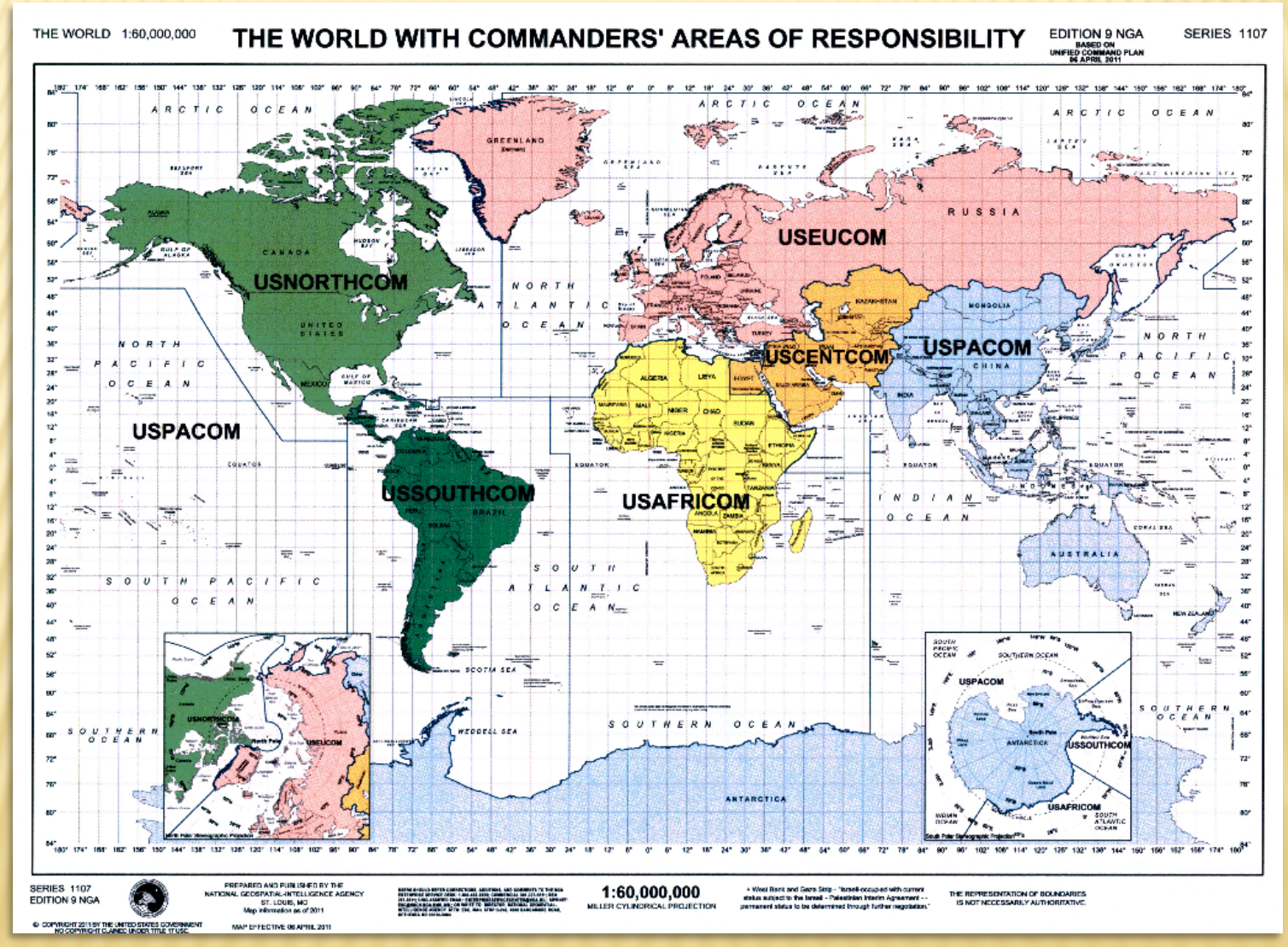
COORDINATION RESPONSIBILITIES

- Levels of guidance and primary coordination responsibilities:
  - Military Departments and Services
    - Support the acquisition and certification process, coordination for use of the spectrum for their units and/or management of allocated spectrum resources.
  - Geographic Commanders
    - Establish policy and procedures for the coordination, management and assignment of military frequencies within their geographical or functional area of responsibility.
  - Local Commanders
    - Local commanders will ensure maximum coordination for the use of radio frequencies within their area of responsibility.
  - Joint Chiefs of Staff, Military Command, Control, Communications, and Computers (C4) Executive Board (MC4EB) Frequency Panel (FP)
    - Provides expert technical advice by issuing enterprise oversight, guidance and to the acquisition, spectrum and operational communities in the area of spectrum operations to ensure access to the spectrum when and where needed to achieve mission success.

GEOGRAPHICAL BASIS

- Geographic commands are responsible for the management and use of the electromagnetic spectrum and any other spectrum-related matters for the forces directly assigned, attached from other commands, or assigned by the President of the United States or Secretary of Defense within their area of responsibility.
- Geographic commands coordinate spectrum matters with countries in their area of responsibility in support of the MC4EB. Additionally, commands coordinate with the host nation and obtain approval of frequencies for US/Coalition forces.
  - US Africa Command (USAFRICOM)
  - US Central Command (USCENTCOM)
  - US European Command (USEUCOM)
  - US Northern Command (USNORTHCOM)
  - US Pacific Command (USPACOM)
  - US Southern Command (USSOUTHCOM)

GEOGRAPHIC COMMANDS



FUNCTIONAL BASIS

- Functional commands manage and control the use of frequencies used by the military forces assigned to their command. However, functional commands must coordinate with the geographical commands when operating in their area of responsibility.
  - US Special Operations Command (USSOCOM)
  - US Strategic Command (USSTRATCOM)
  - US Transportation Command (USTRANSCOM)

DOD AREA FREQUENCY COORDINATORS

- DoD Area Frequency Coordinators maintain close liaison and coordination on matters of mutual interest with other military and civil frequency coordination activities in, among and within line of- sight to their areas of operation. They minimize electromagnetic interference at, among, and within line-of-sight of national and military test and training ranges and with all civil and non-military federal activities within their electromagnetic environment.

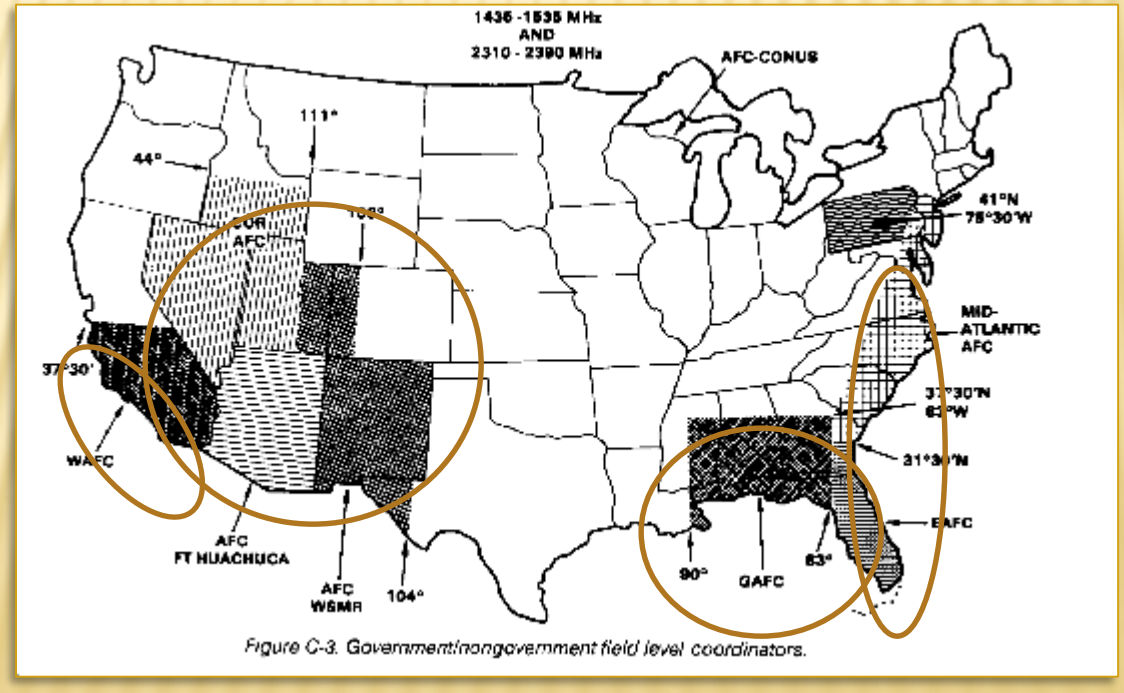


Figure C-3. Government/nongovernment field level coordinators.

MAJOR RANGE AND TEST FACILITY BASE

Major Range and Test Facility Base (MRTFB) is a set of test installations, facilities, and ranges which are regarded as "national assets."

- **Department of the Army Facilities:**

  White Sands Test Center, White Sands Missile Range, NM; High Energy Laser Systems Test Facility, White Sands Missile Range, NM; US Army Kwajalein Atoll (Ronald Reagan Ballistic Missile Defense Test Site); Yuma Test Center, Yuma Proving Ground, AZ; Redstone Test Center, Redstone Arsenal, AL; Cold Regions Research and Engineering Laboratory (CRREL), Hanover, NH; Tropic Regions Test Center, Yuma Proving Ground, AZ; West Desert Test Center, Dugway, UT; Aberdeen Test Center, Aberdeen Proving Ground, MD; Electronic Proving Ground, Fort Huachuca, AZ; National Training Center (NTC), Fort Irwin, CA; Joint Readiness Training Center (JRTC), Fort Polk, LA.

- **Department of the Navy Facilities:**

  Naval Air Warfare Center-Weapons Division, Point Mugu, CA; Naval Air Warfare Center-Weapons Division, China Lake, CA; Naval Air Warfare Center-Aircraft Division, Patuxent River, MD; Naval Undersea Warfare Center, Atlantic Undersea Test and Evaluation Center (AUTEC), Andros Island, Bahamas; Pacific Missile Range Facility, Barking Sands, Kauai, HI; Keyport Pacific Northwest Range Complex (Nanoose and Dabob Ranges), Keyport, WA.

- **Department of the Air Force Facilities:**

  Eastern Test Range (45th Space Wing), Patrick AFB, FL; Western Launch & Test Range (30th Space Wing), Vandenberg AFB, CA; Arnold Engineering Development Center, Arnold AFB, TN; Nevada Test and Training Range (Nellis AFB, NV); Air Force Flight Test Center, Edwards AFB, CA; Utah Test and Training Range, Hill AFB, UT; Gulf Test Range (96th Test Wing & 96th Test Group), Eglin AFB, FL.

PROCESS

SPECTRUM SUPPORTABILITY PROCESS

- The Program Manager is responsible for development, production, and sustainment to meet the user's operational needs.
  - The Program Manager must oversee the design of all spectrum-dependent systems to operate compatibly with other systems in the intended operational electromagnetic environment.
- An Application for Equipment Frequency Allocation (or EL-CID) must be prepared during the development or procurement of any spectrum-dependent equipment or system, including commercial off the shelf, government off the shelf, or other non-developmental procurement.
- Foreign host nation supportability comments should be requested as early as possible, but no later than Stage 3 for all developmental systems and prior to the deployment of any commercial off the shelf or government off the shelf equipment.
- Geographic commands must report foreign host nation comments or coordination status within 60 days.
  - These supportability comments are to be entered into the Host Nation Spectrum Worldwide Database Online (HNSWDO) system.

SPECTRUM SUPPORTABILITY RISK ASSESSMENT (SSRA)

The assessment requires, at a minimum, receipt of equipment spectrum certification, reasonable assurance of the availability of sufficient frequencies for operation from Host Nations (HN), and a consideration of Electromagnetic Compatibility (EMC).

Table A-II Summary of Spectrum and E3 Issues (SAMPLE)

Issue	Likelihood of Occurrence (See Table IV)	Impact of Risk (See Table III)		
Regulatory issue # 1 - ESC status				
Regulatory issue #.2 - HNC status	Insert colors, as applicable			
Technical spectrum issue				
Operational spectrum issues				
E3 issues				
		NONE/MINIMAL	MODERATE	SIGNIFICANT/SEVERE

RECOMMENDED MITIGATION MEASURES:

Regulatory issue #1 (ESC status):
Regulatory issue #2: (HNC status):
Technical spectrum issue:
Operational spectrum issue:
E3 issues

EQUIPMENT SPECTRUM CERTIFICATION

- Equipment that was designed for government-only or commercial operation in the US&P may not be supportable in, or allowed to be imported into, other nations.
  - The regulatory aspects of spectrum supportability are achieved when S-D equipment has been determined by the Host Nation spectrum regulatory authority that the capability may be capable of operating in compliance with the rules, regulations and operational parameters set down by that authority.
  - Non-conforming equipment or systems often face denial by Host Nation as early as possible is critical to avoid delays in the acquisition timeline.
  - S-D systems that do not comply with the respective Host Nation tables of allocation most likely will not be allowed to operate under the sovereign rights of that country.
    - The United States is treated as a Host Nation.

DOD INFORMATION TECHNOLOGY PORTFOLIO REPOSITORY

- Used to satisfy statutory and management reporting requirements, including Federal Information Security Management Act (FISMA) reporting and the Business Management Modernization Program (BMMP) certification process.
- *Use of Electromagnetic Spectrum in Investment*
  - *System or equipment completed Spectrum Supportability Risk Assessment.*
  - *Technical performance data of the system/equipment registered in the Equipment Location – Certification Information Database (EL-CID).*
  - *Spectrum supportability guidance, from Interdepartment Radio Advisory Committee's (IRAC) Spectrum Planning Subcommittee (SPS) and the Military Communications Electronic Board (MCEB) Frequency Panel's (FP) Equipment Spectrum Guidance Permanent Working Group (ESG PWG).*

CONTRACTUAL COMMITMENTS

- All DOD components, including equipment developers, must adhere to certain mandatory International, US Government, Federal, and DOD policies and procedures prior to making contractual commitments for the development or procurement of S-D equipment.

FREQUENCY COORDINATION PROCEDURES FOR US&P

- Frequency proposals for exercises are submitted to the sponsoring organization. The sponsoring organization is responsible to coordinate, obtain, and provide the frequency resources for the specific exercise at least **90 days** prior to commencement of required operations.

- Frequency requirements for individual DOD installations, bases, and training areas (other than in c. above) will be submitted and coordinated per Service policy. Tactical training and operations frequency use are normally controlled and managed at the installation, base, and local training area. These are separate from the AFC and DOD Training Centers. These include the Reserve and National Guard forces.

INTERFERENCE RESOLUTION

- Electromagnetic Interference (EMI) may be caused by friendly, enemy, neutral, or natural sources. conflicting or competing use of the spectrum should be expected.
  - Interference must be solved on a case-by-case basis with resolution by the lowest level capable within the spectrum management structure.
  - Interference not able to be resolved at the lowest level must be reported and elevated to the next responsible agency.
    - The Joint Spectrum Interference Resolution team is in on call 24 hours a day and is capable of global deployment with its equipment.
- The following minimum information is required in a JSIR report:
  - Affected System Frequency
  - Network Control Station & Principal User
  - Other Stations/Units Experiencing Interference
  - Location of Affected System
  - Operating Mode of the Affected System: Frequency Agile, Pulse Doppler, Search, Upper/Lower Sideband, etc.
  - GPS Affected
  - Interference Frequency, Bandwidth, and Signal Strength
  - Interference Characteristics: Continuous, Intermittent, Random, or Characteristic Pattern; Varied or Constant Amplitude; Noise and/or Pulsed
  - System Impact and Circuit Reliability
  - Interference Cause(s) and Source(s):
    - Dates and Times
    - Resolution (A) Specific Actions Taken To Mitigate, Nullify, Identify
    - Source(s) of & Resolve Interference
    - Resolution Status
    - Request for Resolution Assistance

ELECTRONIC ATTACK

- Electronic Warfare is defined as "military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy."
  - NTIA Manual 7.14 PERFORMANCE OF ELECTRONIC ATTACK TEST, TRAINING, AND EXERCISE OPERATIONS
    - Frequency use for the performance of electronic attack test, training, and exercise operations is governed by The Joint Chiefs of Staff Manual CJCSM 3212.02C (Performing Electronic Attack in the United States and Canada for Tests, Training, and Exercises), dated March 20, 2011. The use of this manual is mandatory for all DoD components and contractors performing electronic attack test, training, and exercise operations.
    - The manual contains the details concerning authorized frequency bands, geographical restrictions and frequency clearance procedures for conducting electronic attack in the United States and Canada. This manual is only approved for limited release to DoD components (to include the combatant commands) and other federal agencies. Copies of this manual are available through controlled internet access only (limited to.mil and .gov users) at https://ca.dtic.mil/cjcs_directives/cdata/limited/m321202.pdf.

SUPPORT TO CIVIL AUTHORITY

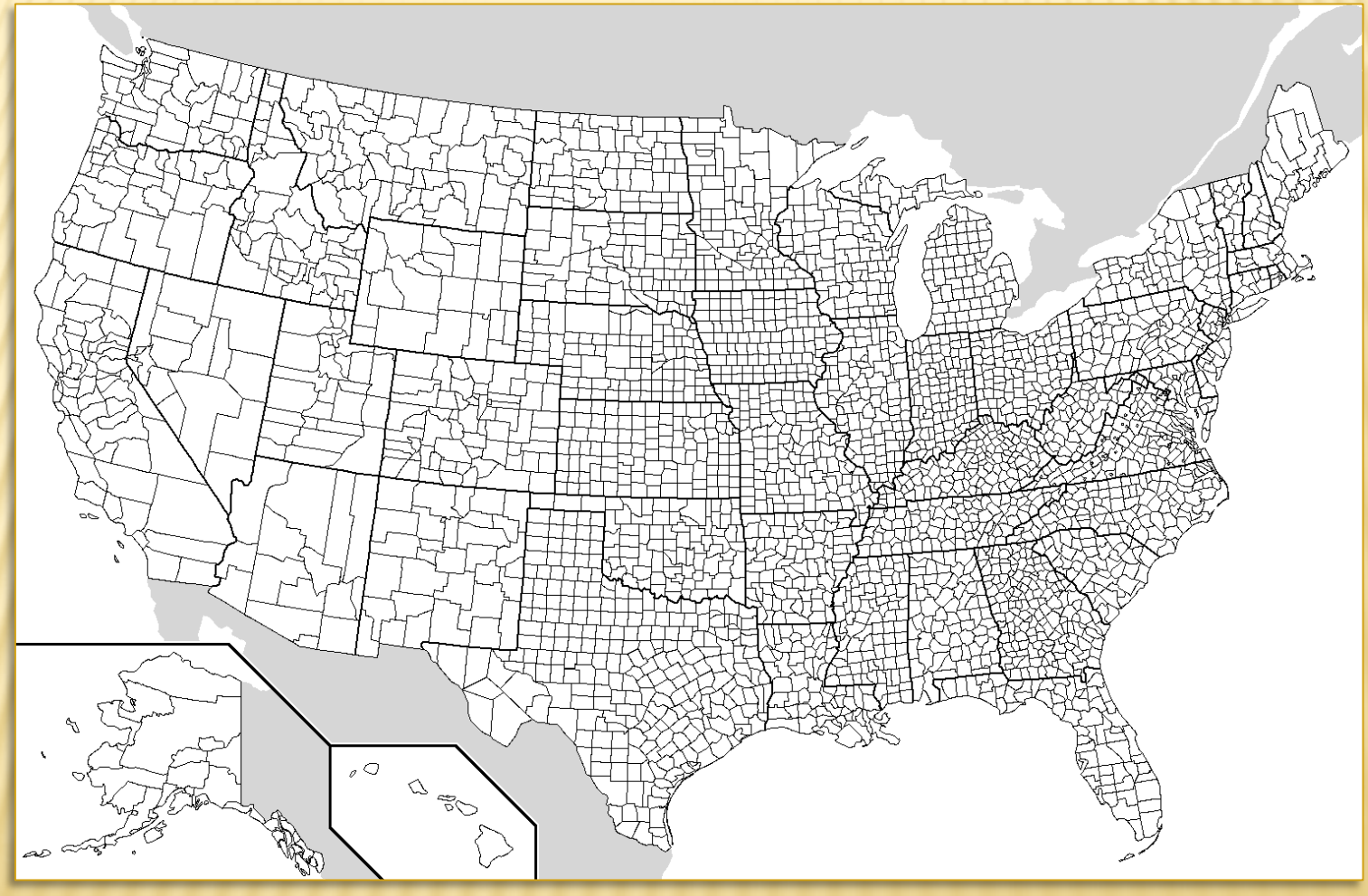
- Presidential Declaration
  - The President is the chief executive authority regarding incidents. the President declares incidents to be disasters or emergencies.
  - President declares incidents to be of national significance.
  - The President can delegate authority to other, e.g., to the Department of Homeland Security for domestic emergencies.
  - The Department of Homeland Security (DHS) is designated as the "Principal Federal Official" for domestic incident management.
- Military Support to Federal Response:
  - USNORTHCOM is responsible for planning, organizing, and executing HLD/DSCA missions within CONUS, Alaska, and territorial waters. In addition, to the landmasses of the United States, Canada, and Mexico; USNORTHCOM's area of responsibility includes the coastal approaches, the Gulf of Mexico, Puerto Rico, and the US Virgin Islands.
  - USPACOM of the state of Hawaii; the US territories of Guam, American Samoa, Jarvis Island, Wake Atoll, Midway Atoll, Johnston Atoll, Baker Island, Howland Island, Palmyra Atoll, and Kingman Reef; the Commonwealth of the Northern Mariana Islands and the Freely Associated States (FAS) under the Compacts of Free Association which include the Federated States of Micronesia (FSM), the republic of the Marshall Islands (RMI), and the Republic of Palau (ROP).
  - NORAD: When directed by the President or the Secretary of Defense to provide civil support, CDRUSNORTHCOM also commands the NORAD, a bi-national command responsible for aerospace warning, aerospace control, and maritime warning for Canada, Alaska and the Continental United States (CONUS).

SUPPORT TO CIVIL AUTHORITY

- The term “civil support” is defined as military support to civil authorities for domestic emergencies and for designated law enforcement and other activities.
  - Natural or man-made disasters and special events can be so demanding that the local, tribal, state and non-military federal responders are temporally overwhelmed by the situation.
  - The military has a long history of supporting civil authorities in the wake of catastrophic events.
  - When directed by the President or the Secretary of Defense, USNORTHCOM and USPACOM will respond quickly and effectively to the request of civil authorities to save lives, prevent human suffering, and mitigate great property damage.
  - Military operations that are not the result of Presidential or Secretary of Defense direction, and occurring outside of Federal Military property, may not be reimbursable or legally viable.
  - Military forces, to include Installation Spectrum Managers, are encouraged to coordinate with State Incident Commanders.
- Governors may request Federal assistance.
  - The “usual and customary arrangement” when U.S.C. 10 forces and U.S.C. 32 forces will serve together for Civil Support, or on a domestic operation, is that they will be commanded by a Dual Status Commander appointed by the State Governor and confirmed by the Secretary of Defense.
  - The Governor is the executive authority over State capabilities in any disaster response.
  - **Every local jurisdiction has authority within its own boundaries .**

3,143 counties in the United States

SUPPORT TO CIVIL AUTHORITY



SPECTRUM USE OUTSIDE THE UNITED STATES

- Subject to restrictions and approval from the Host Nations and any additional guidance from the respective Geographic Command or Allied Force Commands.
  - Frequency coordination with foreign governments that falls within a Geographic Command Area of Responsibility is handled by the Geographic Command Spectrum Management Office via established military channels.
  - Coordination with foreign governments not within a Geographic Command Area of Responsibility or where the Geographic Command has not established military coordination channels is normally handled through the Department of State.

SPECTRUM USE OUTSIDE THE UNITED STATES

- Upon receipt of foreign host nation equipment spectrum certification comments, the unit must then submit a request for frequencies to the supporting component Spectrum Management Office.
- Coordination with foreign nation varies per country.
- Some foreign host nation Status of Forces Agreements include a clause that states it may be necessary for the United States Armed forces to use electromagnetic spectrum, and that spectrum use should be free of cost to the United States Government. It is highly encouraged that agreements with HNs include such a clause, but if not, Services and geographic commanders should not agree to pay for temporary or permanent spectrum use in support of military training, exercises, and operations per Vice-Chairman of the Joint Chiefs of Staff Memo, CM-00101-13.
- Frequency coordination for satellite communications normally occurs outside spectrum management channels.

FOREIGN FORCES DEPLOYING EQUIPMENT INTO THE US

- Equipment Spectrum Supportability for S-D equipment for testing, training, and exercises must be obtained by foreign forces from NTIA prior to the deployment of any S-D equipment into the US&P. While the geographical CCMDs are not responsible to act as liaisons for this process, they are expected to assist HN Foreign Military Forces seeking spectrum support within the US&P.
  - CCMDs shall assist by placing HN representatives in contact with the appropriate MILDEP or organization sponsoring the foreign force's activities within the US&P.
  - ESG PWG has established a process to provide preliminary spectrum supportability comments in response to requests from HNs.
  - Supportability comments from AFC(s) **may be required** if use of the S-D system is intended for a DOD Test Range.
  - The DD Form 1494 "Application for Equipment Frequency Allocation (Rev 05/2014)" was modified by Naval Forms Management Office and can be located at http://www.dtic.mil/whs/directives/forms/dd/ddforms1000-1499.htm. For general DD 1494 form inqueries contact your command's forms manager. If your command does not have a forms manager contact: The Department of the Navy Forms Management Office at opnav.donforms.dns51@navy.mil.

Non-military coordination being refined with NTIA

FREQUENCY COORDINATION FOR FOREIGN FORCES OPERATING IN THE UNITED STATES

- All foreign forces deploying to United States to participate in training or exercises need to submit their frequency requirements to the sponsoring organization.
  - Geographical commands may assist with the coordination of frequency requirements by forwarding any documentation received from the foreign forces in their area to the sponsoring organization and providing the foreign forces with contact information for the sponsoring organization to facilitate further coordination.
  - If requested by a sponsoring organization, the geographical commands may be able to facilitate initial contact and provide the sponsoring organization with the contact information for foreign forces representatives.
- Final frequency assignment is the responsibility of the sponsoring organization.

FREQUENCY COORDINATION FOR FOREIGN FORCES OPERATING IN THE UNITED STATES

- The United States Military Spectrum Management Office receive notifications of Foreign Forces entering the United States.
  - Army Spectrum Management Office (ASMO), Navy Marine Corps Spectrum Center (NMSC) and Air Force Spectrum Management Office (AFSMO), and United States Coast Guard (USCG).
- The United States Military Spectrum Management Office responsible to provide spectrum management support will be based upon the location where the Foreign Forces intend to operate (base, camp, post, station, test range, etc.).
  - Examples, if a Foreign Force intends to conduct training or testing at White Sands Missile Range or other Army sponsored sites, requirements will be processed through Army channels to ASMO, who in turn will be responsible to obtain SM support; if a Foreign Force intends to conduct training or testing at China Lake or other Navy sponsored sites, requirements will be processed through Navy channels to NMSC.
- If feasible, Geographic commands (USAFRICOM, USCENTCOM, USEUCOM, USNORTHCOM, USPACOM, or USSOUTHCOM) will assist Foreign Forces in obtaining spectrum management support for exercises in the United States.
- During the United States National Level coordination process, the proposal must be evaluated by other Federal agencies operating within the area of operation. This process includes coordination with the FCC, FAA, other MILDEP SMOs, Mexico and or Canada, as required.
- Once a frequency is authorized by the NTIA, the responsible United States Military Spectrum Management Office is notified.
  - National Guard and Reserve components, tasked to train foreign forces and or test systems, must submit frequency proposals to the appropriate United States Military Spectrum Management Office in accordance with established procedures.

THANK YOU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