BY ORDER OF THE SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 33-580

17 JANUARY 2013

UNITED STATES AIR FORCES IN EUROPE Supplement

27 NOVEMBER 2014
Certified Current on 13 June 2016
Communications and Information

SPECTRUM MANAGEMENT

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available on the e-Publishing website at **http://www.e-publishing.af.mil** for download or ordering

RELEASABILITY: There are no releasability restrictions on this publication.

OPR: AFSMO/XP — Certified by: SAF/A6W (Brig Gen Jeffrey Kendall)

Supersedes: AFI33-118, 18 July 2005 — Pages: 97

(USAFE)

OPR: HQ USAFE-AFAFRICA/A6OF — Certified by: SAF/A6W (Brig Gen Brian Killough)

Supersedes: AFI33-118_USAFESUP, 20 September 2006 — Pages:18

This instruction establishes guidance and procedures for Air Force-wide management and use of the electromagnetic spectrum and implements Department of Defense Instruction (DoDI) 4650.01, *Policy and Procedures for Management and Use of the Electromagnetic Spectrum*; DoDI 8320.05, Electromagnetic Spectrum Data Sharing; National Telecommunications and Information Administration (NTIA) Manual of Regulations and Procedures for Federal Radio Frequency Management; Air Force Policy Directive (AFPD) 33-5, *Warfighting Integration*; and the procedures established by the Joint Staff J65A United States Military Communications-Electronics Board (USMCEB). It identifies various levels of responsibilities for Air Force (AF) management of the electromagnetic (EM) spectrum and provides procedures for implementation. This publication applies equally to the Air Force Reserve (AFR) and Air National Guard (ANG) operating under Title 10 or developing and/or using Title 10 spectrum dependant equipment. Refer technical questions about this publication to the Air Force Spectrum Management Office (AFSMO), 6910 Cooper Avenue, Fort Meade, MD 20755-7088. This publication may be supplemented at any level, but all direct Supplements must be routed to the OPR of this publication for coordination prior to certification and approval. Send recommended changes or comments to Air Force Network Integration Center (AFNIC/ESPL), 203 West Losey Street,

Room 1100, Scott AFB IL 62225-5222, through appropriate channels, using Air Force (AF) Form 847, *Recommendation for Change of Publication*. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, Management of Records, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at **https://www.my.af.mil/afrims/afrims/afrims/rims.cfm**. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the AF. See **Attachment 1** for a glossary of references and supporting information.

(USAFE) This supplement implements and extends the guidance of AFI33-580, *Spectrum Management.* It establishes USAFE policy for spectrum management of all units within USAFE and AFAFRICA responsibility. It identifies various levels of responsibilities for Air Force (AF) management and use of the electromagnetic (EM) spectrum and provides procedures for implementation. This publication applies equally to the Air Force Reserve (AFR) and Air National Guard (ANG) operating under Title 10 or developing and/or using Title 10 spectrum dependent equipment. Refer technical questions about this publication to the Air Force Spectrum Management Office (AFSMO), 6910 Cooper Avenue, Fort Meade, MD 20755-7088. This publication may be supplemented at any level, but all direct Supplements must be routed to the OPR of this publication for coordination prior to certification and approval. Send recommended changes or comments to Air Force Network Integration Center (AFNIC/ESPL), 203 West Losey Street, Room 1100, Scott AFB IL 62225-5222, through appropriate channels, using Air Force (AF) Form 847, *Recommendation for Change of Publication*. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS). The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the AF. See **Attachment 1** for a glossary of references and supporting information.

SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. Major changes include: realignes publication number in accordance with SAF/A6 guidance, updates spectrum guidance found in DoDI 4650.01, Policy and Procedures for Management and Use of the Electromagnetic Spectrum, adds policy on Windmills, and implements new DoD spectrum data guidance found in DoDI 8320.05, Electromagnetic Spectrum Data Sharing.

(USAFE) This document has been substantially revised and must be completely reviewed. Major changes include the addition of the following spectrum guidance and policy updates: USAFE-AFAFRICA SAVs and emitter surveys, USAFE-AFAFRICA ISM spectrum data, USAFE-AFAFRICA ISM SIPRNET access, USAFE-AFAFRICA user training, USAFE-AFAFRICA MOB data exchange capability, USAFE-AFAFRICA equipment exemptions, USAFE-AFAFRICA temporary and permanent assignments, USAFE-AFAFRICA frequency coordination process, USAFE-AFAFRICA frequency assignment review checklist, USAFE-AFAFRICA Germany Commerical-Off-the-Shelf (COTS) worksheet, USAFE-AFAFRICA ACP 190 NATO SUPP-1(B) use, USAFE-AFAFRICA CE certification, USAFE-AFAFRICA Link-16

procedures, USAFE-AFAFRICA Civil Air Patrol (CAP) processes and USAFE-AFAFRICA Trunked Land Mobile Radio (TLMR) Systems procedures.

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1. Overview.

1.1. Managing the Radio Frequency (RF) Spectrum. National and international regulatory bodies require effective and efficient use of the EM spectrum. Effective and efficient use is defined as applying design or operational techniques that conservatively use EM spectrum in a compatible (i.e., non-interference) manner.

1.2. Allocation. The EM spectrum is allocated between federal and non-federal users with portions of the spectrum shared (see NTIA Manual). Federal users must utilize frequency bands allocated for government or shared use. A government frequency assignment may be authorized in a non-government band provided the request is coordinated and granted approval by the Federal Communications Commission (FCC).

1.3. International Spectrum Management. The International Telecommunications Union (ITU) is the international body responsible for international frequency allocations, worldwide telecommunications standards and telecommunications development activities.

1.3.1. ITU Membership. The United States (US) is one member of the nations that make up the ITU. International agreements signed by the President and ratified by the US Senate gain treaty status.

1.3.2. Host Nation (HN) Approval. The EM spectrum is a natural resource independently managed by each sovereign nation within their boundaries. This basic consideration of international spectrum management becomes extremely important when US military forces operate abroad. Units must obtain HN approval to use frequencies before US forces can legally operate.

2. Roles and Responsibilities.

2.1. Authority.

2.1.1. US National Spectrum Management. The Code of Federal Regulations (CFR) Title 47 United States Code (U.S.C.), Telegraphs, Telephones, and Radiotelegraphs, Section 151 et seq., The Communications Act of 1934, established separate control of federal (government) and non-federal (civilian) use of the EM spectrum. Under this act, the only government agencies that assign and control the use of frequencies in the US are the NTIA and the FCC.

2.2. Organizations.

2.2.1. The NTIA. The NTIA assigns and regulates frequencies for federal users. The NTIA Manual of Regulations for Federal Radio Frequency Management (hereafter "NTIA Manual") governs all federal (including military) use of the EM spectrum within the United States and its Possessions (US&P).

2.2.1. **(USAFE)** The National Telecommunications and Information Administration (NTIA). The NTIA assigns and regulates frequencies for all federal users within the United States and its Possessions (US&P). The NTIA governs all federal (including military) use of the EM spectrum though the Manual of Regulations for Federal Radio Frequency Management (hereafter "NTIA Manual").

2.2.2. FCC. The FCC assigns and regulates frequencies for non-federal users. Non-federal users include private citizens, companies, and state and local government users.

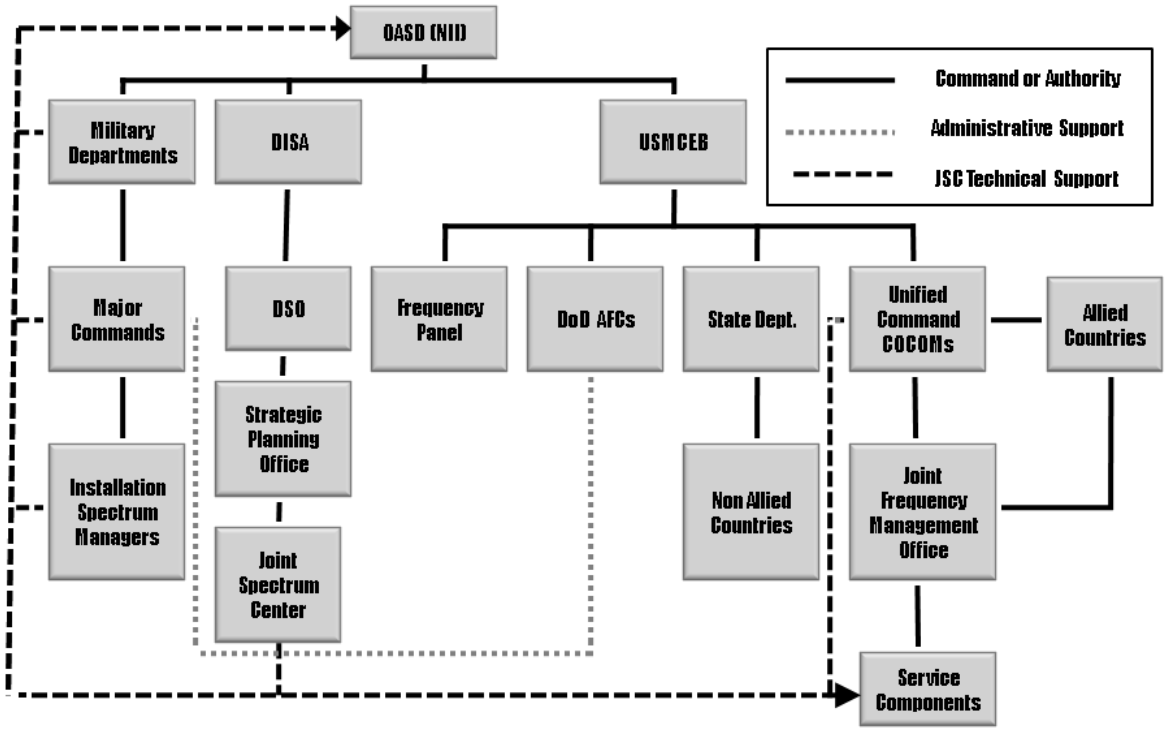
2.2.3. Department of Defense (DoD) Spectrum Management. The Under Secretary of Defense for Acquisition, Technology, and Logistics (USD [AT&L]) sets policy for acquiring systems that use the EM spectrum and ensures compliance with EM spectrum support procedures. The Assistant Secretary of Defense develops overall DoD policy for managing and using the EM spectrum. DoD activities involved in frequency management (see Figure 2.1.) are:

2.2.3.1. USMCEB. The USMCEB, or hereafter "MCEB", develops joint policy and provides direction in military communications-electronics (C-E) matters.

2.2.3.1. **(USAFE)** United States Military Communications-Electronics Board (USMCEB). The USMCEB, or hereafter "MCEB", develops joint policy and provides direction in military communications-electronics (C-E) matters.

2.2.3.2. The MCEB Joint Frequency Panel (JFP). The MCEB JFP provides expert technical advice to the MCEB in the areas of RF engineering and EM spectrum management. Through the Equipment Spectrum Guidance (ESG), it reviews the characteristics of major C-E equipment purchased or developed by the DoD. This is known as the Joint Frequency Equipment Allocation Process (also called the J/F-12 Process) and is defined by requirements established by the NTIA, the Spectrum Planning Subcommittee (SPS), and military joint or allied system review groups. The MCEB, through the Frequency Panel's (FP) Spectrum Operations Working Group (SOPWG), establishes procedures for submitting frequency assignment requests according to requirements established by the NTIA, the Frequency Assignment Subcommittee (FAS), and military joint or allied frequency assignment groups.

Figure 2.1. DoD Spectrum Management.



2.2.3.3. DoD Area Frequency Coordinator (AFC). The DoD AFCs are responsible for ensuring successful frequency coordination in the areas that lie within, are adjacent to, or are within radio line-of-sight (LOS) to any range spectrum dependent system, including all systems brought to a national test range or other designated complex. Activities must coordinate all military frequency use within a DoD AFC area of responsibility (AOR) with the appropriate DoD AFC before starting operations. DoD AFCs are directly responsible to their military department for administrative purposes and to the MCEB for policy guidance. The Allied Communications Publication (ACP) 190 (US SUPP-1), *Guide to Frequency Planning*, contains specific policy guidance. Refer to the NTIA Manual, Annex D and Table 3 for a list of the DoD AFC geographic descriptions, addresses, and phone numbers.

2.2.3.3.1. AF-Sponsored DoD AFCs. The AF provides DoD AFC services at the following locations:

2.2.3.3.1.1. Gulf AFC. Headquarters Air Force Materiel Command (HQ AFMC) provides support to the Gulf AFC at Eglin AFB FL.

2.2.3.3.1.2. Eastern AFC. Headquarters Air Force Space Command (HQ AFSPC) provides support to the Eastern AFC at Patrick AFB FL.

2.2.3.3.1.3. Nellis AFC. Headquarters Air Combat Command (HQ ACC) provides support to the Nellis AFC at Nellis AFB NV.

2.2.3.3.2. AFC Responsibilities. AF-sponsored DoD AFCs will:

2.2.3.3.2.1. Manage coordinate, and assign frequencies for the range commanders according to ACP 190 (US SUPP-1) and the NTIA Manual.

2.2.3.3.2.2. Ensure compliance with the DoD Electromagnetic (EM) compatibility (EMC) program.

2.2.3.3.2.3. Ensure compliance of range and range-hosted spectrum dependent systems with national and DoD spectrum management regulations, policies, and procedures.

2.2.3.3.2.4. Review new or changed DD Form 1494, *Application for Equipment Frequency Allocation*, for impact on range EM spectrum use and provide comments to AFSMO, when appropriate.

2.2.3.3.2.5. Advise the range or area commander, and all affected organizations, of RF interference that may result from scheduled operations and tests, and recommend solutions. Mutual resolution of conflicts is the responsibility of the commanders concerned.

2.2.3.3.2.6. Review and evaluate frequency assignment requests proposed for use within their areas of responsibility. The evaluation will establish the compatibility of proposed frequencies with national and service test and training ranges within line-of-sight of any operations.

2.2.3.3.2.7. Refer unresolved problems on EM spectrum management practices, technical comments, or recommended operating conditions for resolution through AF command channels to AFSMO according to AFI 10-707, *Spectrum Interference Resolution Program*.

2.2.3.3.2.8. Coordinate and de-conflict all range EM spectrum operations under their purview with military, federal, or civil spectrum users, to include within LOS of any ground or airborne system. Resolve all Range Radio Frequency Interference (RFI) incidents within the cognizant AOR and take appropriate action to remove all unauthorized military RFI sources or contact the local FCC office if the source is determined to be a commercial source impacting the military.

2.2.3.3.2.9. Coordinate spectrum use for any airborne system operations where the LOS radio horizon can extend over multiple DoD AFC geographical boundaries.

2.2.3.4. Defense Information Systems Agency (DISA). A Combat Support Agency, engineers and provides command and control capabilities and enterprise infrastructure to continuously operate and assure a global net-centric enterprise in direct support to joint warfighters, National level leaders, and other mission and coalition partners across the full spectrum of operations.

2.2.3.4.1. Defense Spectrum Organization (DSO). The DSO, under DISA, is the

center of excellence for EM spectrum analysis and the development of integrated spectrum plans and long-term strategies to address current and future needs for DoD spectrum access. DSO provides direct operational support to the Chairman of the Joint Chiefs of Staff, Combatant Commanders, Secretaries of Military Departments, and Directors of Defense Agencies to achieve national security and military objectives.

2.2.3.4.1.1. Joint Spectrum Center (JSC). The JSC is a field office of the DSO and supports the Combatant Commands (COCOMs), services, and agencies by providing spectrum planning guidance, system integration, system vulnerabilities and analysis, environmental analysis, test/measurement support, operational support, spectrum management software development, spectrum certification support, and maintains the DoD Frequency Resource Records System (FRRS) and Joint Spectrum Interference Resolution (JSIR) database.

2.2.3.4.1.2. Strategic Planning Office (SPO). The SPO, formerly the Defense Spectrum Office, is responsible for developing comprehensive and integrated spectrum planning and long-term strategies for DoD spectrum access. The SPO is the DoD focal point for participation in national spectrum issues, international spectrum coordination, and for pursuing emerging spectrum efficiency technologies in DoD acquisitions. The purpose of the SPO is to maximize global spectrum access for US forces both now and for the future.

2.2.3.5. COCOM Joint Frequency Management Office (JFMO). All DoD frequency requirements outside the CONUS must be submitted to the appropriate JFMO where operations will be conducted. The JFMO coordinates all HN spectrum certifications: no spectrum dependent equipment will be operated in the COCOM's AOR without JFMO approval.

2.2.3.6. Military Department Spectrum Management Offices (SMO). There are three offices responsible for carrying out spectrum policy within the military services, the US Army SMO, the Navy/Marine Corps Spectrum Center, and AFSMO.

3. Air Force Spectrum Management.

3.1. AF Spectrum Management. Chief Warfighting Integration and Chief Information Office, (SAF/CIO A6) is the senior AF officer responsible for EM spectrum management. SAF/CIO A6 sets policy for managing EM spectrum use to support the AF mission and exercises control over the frequency management process.

3.1.1. AFSMO Roles and Responsibilties. AFSMO represents the AF spectrum user at the national level. AFSMO processes frequency requests through NTIA for use within the US&P while performing these additional roles.

3.1.1.1. Carry out AF EM spectrum management policy.

3.1.1.2. Evaluate AF plans for needed EM spectrum support.

3.1.1.3. Represent and defend AF EM spectrum technical interests in committees, groups, and organizations that address EM spectrum management matters.

3.1.1.4. Negotiate at the departmental, national, and international levels to obtain frequency allocations and assignments to satisfy AF exercises, crises, contingencies, wartime, and day-to-day RF requirements for use of the spectrum.

3.1.1.5. Provide functional guidance to AF sponsored DoD AFCs.

3.1.1.6. Assist in resolution of interference problems with AF assigned frequencies.

3.1.1.7. Provide guidance on using the EM spectrum to developers and users of all AF systems that requires EM spectrum access or whose performance can be influenced by RF energy. This includes communications and information systems, electronic warfare (EW) operations, intelligence and weapons systems, commercial-off-the-shelf (COTS) equipment, and any other equipment that relies on the EM spectrum.

3.1.1.8. Perform staff assistance visits (SAVs) and installation emitter surveys.

3.1.1.9. Determine the impact of EM spectrum dependent systems on current or planned operational use of the EM spectrum.

3.1.1.10. Provide assistance to AF activities requiring JSC services.

3.1.1.11. Assist AF activities in obtaining frequency services.

3.1.1.12. Provide curriculum input and support to the EM Spectrum Management Course and the Joint Task Force (JTF) Spectrum Management Course under the Air Education and Training Command (AETC).

3.1.1.13. Provide spectrum management support to the following COCOMs (US Transportation Command, US Strategic Command, US Central Command, US Northern Command, and US Special Operations Command) IAW DoDD 5100.3, *Support of the Headquarters of Combatant and Subordinate Joint Command.*

3.1.2. MAJCOM Spectrum Management Responsibilities. MAJCOM Spectrum Management:

3.1.2.1. Carries out AF policy, practices, and procedures for managing the use of the EM spectrum.

3.1.2.2. Ensures compliance with the NTIA frequency assignment review program as outlined in paragraph 5.10. Is actively involved in communications/information planning and assists in coordinating and obtaining frequency support to meet the MAJCOM mission.

3.1.2.3. Ensures incorporation of wartime and contingency EM spectrum management procedures into the appropriate operation plan/contingency plan appendices.

3.1.2.4. Provides EM spectrum guidance to the MAJCOM acquisition, logistics, intelligence, operations, and communications planning staffs.

3.1.2.5. Manages EM spectrum use in the concept, planning, deployment, operation, and evaluation phases of MAJCOM supported exercises and operations.

3.1.2.6. Processes and obtains frequency assignments and allocations for spectrum-dependent (S-D) systems in support of operational requirements.

3.1.2.7. Provides guidance on using the EM spectrum early in the concept, exploration, demonstration, and validation phases of the acquisition process.

3.1.2.8. Ensures coordination with the appropriate agencies (Federal Aviation Administration (FAA), FCC, DOD Area Frequency Coordinators, etc.) is accomplished prior to frequency assignment.

3.1.2.9. Reviews the subordinate unit EM spectrum management programs.

3.1.2.10. Performs SAVs and emitter surveys.

3.1.2.10.1. **(Added-USAFE)** The USAFE-AFAFRICA Spectrum Management Office (SMO) will assist the Installation Spectrum Managers (ISM) when performing base-wide emitter surveys on all main operating bases (MOB). USAFE-AFAFRICA SMO will track and coordinate required corrective actions documented in the emitter survey report. ISMs will perform the surveys every 5 years referencing emitter survey checklist (see Attachment 11)

3.1.2.11. Assists organizations from degrading friendly systems or operations during command, control, and communications countermeasures training activities.

3.1.2.12. Ensures subordinate entities (Numbered AF, Wing, Center, Installation Spectrum Manager [ISM], etc.) provide appropriate spectrum and guidance to users.

3.1.2.13. Provides ISMs with the necessary spectrum management training resources required to perform as the ISM.

3.1.2.14. Ensures ISMs have current spectrum data.

3.1.2.14.1. **(Added-USAFE)** The USAFE-AFAFRICA SMO will provide all additional duty ISMs (not 3D1X4), which are non-Spectrum XXI data exchanging clients, a current spawned data file from Spectrum XXI of all unclassified frequencies assigned to the installation and those outlying facilities hosted by the installation. Data files must be provided at least quarterly.

3.1.2.15. Provides AFSMO with curriculum input recommendations for the EM Spectrum Management Course and the JTF Spectrum Management Course.

3.1.2.16. Provides assistance to MAJCOM IG in inspecting subordinate units or activities. Helps ensure Critical Compliance Items (CII) are identified and complied with when accomplishing self-inspections and compliance inspections.

3.1.3. Numbered Air Force (NAF) Spectrum Management Office Responsibilities. NAF spectrum management carries out Air Force policy, practices, and procedures for managing use of the EM spectrum. NAF spectrum management will:

3.1.3.1. Be actively involved in communications and information planning, and assists in coordinating and obtaining frequency support to meet the MAJCOM or COCOM mission.

3.1.3.2. Provide MAJCOM RF spectrum guidance to the NAF planning staff, including logistics, intelligence, operations, communications, and subordinate units.

3.1.3.3. Consider and coordinate RF spectrum use during the conceptual, planning, deployment, operation, and evaluation phases of exercises and operations.

3.1.3.4. Forward all frequency requests to the MAJCOM or COCOM, as appropriate, spectrum management office for coordination and approval. Obtain frequency assignments and allocations for spectrum-dependent systems as directed by Commander, MAJCOM or COCOM in support of exercises, contingencies, or wartime operations requirements.

3.1.3.5. Obtain frequency assignments and allotments for S-D systems as directed by the Commander, MAJCOM or COCOM in support of exercises, contingencies, or wartime operational requirements.

3.1.3.6. Maintain, as a minimum, the current edition of the frequency management publications applicable to the NAF AOR.

3.1.3.7. Maintain an accurate SPECTRUM XXI database of all frequency assignments within the NAF AOR.

3.1.4. Installation Commander Responsibilities.

3.1.4.1. Responsible for all EM radiation emanating from the installation and from those outlying activities hosted by the installation.

3.1.4.2. Ensures a viable RF management program is in place and supports installation requirements. The installation commander can prohibit any RF emitter from operating (cease and desist) when anticipating or resolving interference to mission essential EM equipment.

3.1.4.3. Appoint in writing, a primary and alternate ISM to organize and carry out the spectrum management program and notify the appropriate MAJCOM. Review program and appointments annually.

3.1.5. Spectrum Managers assigned to Wings, DoD Ranges, Groups, and Squadrons Overview and Responsibilities. Wing, DoD Ranges, Groups, and Squadron Spectrum Managers Will:

3.1.5.1. Carry out AF policy, practices, and procedures for managing the use of the EM spectrum with their AOR.

3.1.5.2. Assist organizations and users within their control in communications/information planning, coordinating, and obtaining frequency support to meet the mission.

3.1.5.3. Ensure incorporation of Wing, DoD Range, Group, and Squadron contingency EM spectrum management procedures are appropriately placed in operational plans/contingency plans and appendices as needed.

3.1.5.4. Provide EM spectrum guidance to users in acquisition, logistics, intelligence, operations, and communications planning staffs.

3.1.5.5. Manage EM spectrum use in the concept, planning, deployment, operation, and evaluation phases of Wing, DoD Range, Group, or Squadron supported exercises and operations under their control.

3.1.5.6. Provide guidance to users (program/project offices) of the EM spectrum early in the concept, exploration, demonstration, and validation phases of the acquisition process.

3.1.5.7. Review and update frequency assignment records under control of the Wing, DoD Range, Group, or Squadron areas of responsibility.

3.1.6. Communications Commander or Director Responsibilities.

3.1.6.1. Ensure the ISM serves a minimum of 12 months in the position unless mission requirements dictate otherwise.

3.1.6.2. Ensure the ISM maintains the necessary spectrum management training.

3.1.6.3. Ensure the ISM has Secret Internet Protocol Router Network (SIPRNET) access.

3.1.6.3.1. **(Added-USAFE)** Ensure SIPRNET access is collocated with ISM's primary workspace.

3.1.6.3.2. **(Added-USAFE)** Ensure ISM SIPRNET access has print capability.

3.1.6.3.3. **(Added-USAFE)** Ensure data exchange capability with Spectrum XXI via SIPRNET. Traditionally, thick-clients are used for ISM SIPRNET access as thin clients do not typically support Oracle data exchange capability with Spectrum XXI.

3.1.7. Installation Spectrum Manager Responsibilities. The ISM will:

3.1.7.1. Ensure using activities understand the parameters of their assigned frequencies.

3.1.7.2. Maintain current frequency management records of all frequencies assigned to the installation and outlying activities hosted by the installation. Provide using activities with an approved Radio Frequency Authorization (RFA).

3.1.7.3. Meet with all using activities annually to discuss current spectrum management issues and conduct customer education. Conduct site visits as necessary or perform emitter surveys every 5 years with assistance from MAJCOM.

3.1.7.3.1. **(Added-USAFE)** Meets with all unit points of contact (POC) at least every 6 months to discuss current spectrum management issues and conduct customer education.

3.1.7.4. Process frequency proposals and applications for equipment frequency allocations and ensure submission through the appropriate command channels.

3.1.7.5. Provide spectrum management assistance and interpret guidance to host installation and tenant activities.

3.1.7.6. Review installation operation plans and requirements documents, and obtain frequency support through command channels. Additionally, ISMs must regularly contact:

3.1.7.6.1. Deployable units to identify upcoming exercises and contingencies.

3.1.7.6.2. Installation planning offices to obtain information about S-D equipment.

3.1.7.7. Ensure contractor activities using AF frequencies to support AF requirements follow AF policies for EM spectrum use (see Chapter 3.7.).

3.1.7.7.1. **(Added-USAFE)** All MOBs (exception: Lajes Field) will become Spectrum XXI data exchanging clients to expedite the frequency coordination process. This requires SIPRNET connectivity. All MOB ISMs must have SIPRNET e-mail accounts.

3.1.7.8. In cooperation with using activities, verify frequency assignment requirements, validate existing frequency assignment parameters, and submit appropriate modifications, renewal, or deletion actions through the appropriate MAJCOM.

3.1.7.9. Be responsible for updating and maintaining their records in the FRRS.

3.1.7.10. Draft spectrum management portion of any memorandum of understanding (MOU) or memorandum of agreement (MOA) and maintain a copy.

3.1.7.11. Maintain a current point of contact (POC) listing (name, unit, e-mail address, and phone number) for all using activities. This listing will be updated annually at a minimum.

3.1.7.12. Write and publish installation instructions or supplements to this instruction, as required. Draft copies should be sent to the parent MAJCOM for review before publishing. Once published, a copy of the final publication should be sent to the MAJCOM and kept on file as long as it is valid.

3.1.7.13. Educate using activities, program/project offices, etc. on the importance of obtaining spectrum supportability guidance and validation prior to entering into a contractual obligation for all EM spectrum dependent systems.

3.1.7.14. Comply with the requirements of the Frequency Review Program (see Chapter 3).

3.1.7.15. Coordinate with FAA Service Areas and DoD AFCs on aeronautical radionavigation spectrum matters to include the following:

3.1.7.15.1. For all aeronautical radionavigation frequencies prior to use. The FAA coordinates on the required service volume, the desired-to-undesired signal protection (in decibels [dBs]), nominates channels/frequencies for the Instrument Landing System (ILS), Very High Frequency (VHF) Omnidirectional Range (VOR), Tactical Air Navigation (TACAN) and Air Traffic Control (ATC) operations, and provides the Pulse Repetition Rate (PRR) for radars.

3.1.7.15.2. The FAA coordinator provides a coordination serial number that must be entered in Standard Frequency Action Format (SFAF) Item 520.

3.1.7.15.3. AF installations having an ATC support agreement with a FAA facility for local control of civil aircraft will be assigned suitable VHF frequencies for control of civil aircraft.

3.1.7.15.4. Agencies requiring frequencies in the bands listed in the NTIA Manual, Annex D, will coordinate all actions with the appropriate FAA frequency coordinators listed in Table 1 of that Annex.

3.1.7.15.5. Review MCEB JFP host-nation supportability comments. Report all MCEB JFP host-nation supportability findings to program/project offices before they enter into a contractual obligation for the full-scale development, production, or procurement of RF systems.

3.1.8. Program/Project/Acquisition Offices, Operating Units, Test Organizations, Tenant Units, and other using activities will:

3.1.8.1. Ensure the appropriate spectrum supportability requirements are met prior to purchasing any RF equipment or entering into any contractual obligations involving the use of RF dependent devices to include providing correct technical data for systems not downward directed by higher level organizations.

3.1.8.2. Obtain a frequency assignment prior to operation of any S-D devices that intentionally emit RF energy.

3.1.8.3. Maintain a copy of frequency authorizations received from the ISM.

3.1.8.4. Request the minimum number of frequencies necessary to accomplish the mission.

3.1.8.5. Request the minimum transmitter power and antenna gain/height necessary to ensure adequate coverage.

3.1.8.6. Ensure EM radiating equipment operations comply with authorized parameters identified in the frequency assignment notification.

3.1.8.7. Act promptly to report and resolve incidents of interference according to AFI 10-707.

3.1.8.8. Use radiation-suppression devices (dummy loads) as much as possible when tuning, testing, or experimenting with any equipment that emits radio frequencies.

3.1.8.9. Provide, in writing to the ISM, the name, e-mail address, and phone number of a POC for unit frequency matters and provide updated information immediately when the POC information changes.

3.1.8.10. Notify the ISM, in writing, immediately when frequencies are no longer required.

3.1.8.11. Obtain approval through the ISM before modifying any existing emitters or antennas (i.e., increase power, change antenna height or gain), if outside of the assigned parameters of the frequency authorization.

3.1.8.12. Assist the ISM in reviewing and verifying equipment parameters during mandatory and periodic reviews.

3.1.8.13. Contact the ISM for interpretation or guidance of any spectrum management policy.

3.1.8.14. Complete Spectrum Supportability Risk Assessment per DoDI 4650.01, *Policy and Procedures for Management and Use of the Electromagnetic Spectrum,* 9 January 2009, Enclosure 3, paragraph 3 and Table 1, *Acquisition Oversight of Spectrum Supportability Risks*.

4. Spectrum Certification.

4.1. Process and Guidance. Spectrum certification is the process of reviewing the equipment characteristics to determine realistic supportability expectations to include conformance with the international and national allocation tables, and EMC standards (see Figure 4.1.). This process, often referred to as equipment certification, is required for all RF emitters (transmitters or receivers) including COTS and non-developmental items purchased, unless specifically exempt, as stated in section 2.4. The successful completion of the certification process provides the ability to obtain a frequency assignment for each discrete frequency required in order to have authority to operate within the guidelines developed for the certified system. The policies and procedures for S-D equipment are defined in DoDI 4650.01.

4.1.1. DoDI 4650.01. Requires all DoD components to obtain spectrum guidance for S-D systems from the NTIA and/or the MCEB. Spectrum guidance including spectrum certification, frequency assignments, and spectrum supportability risk assessments (SSRAs) should be developed prior to authorization for operations being granted. Components must also obtain guidance before assuming contractual obligations for the full-scale development, production, or procurement of those systems. Guidance must be obtained through the spectrum certification process.

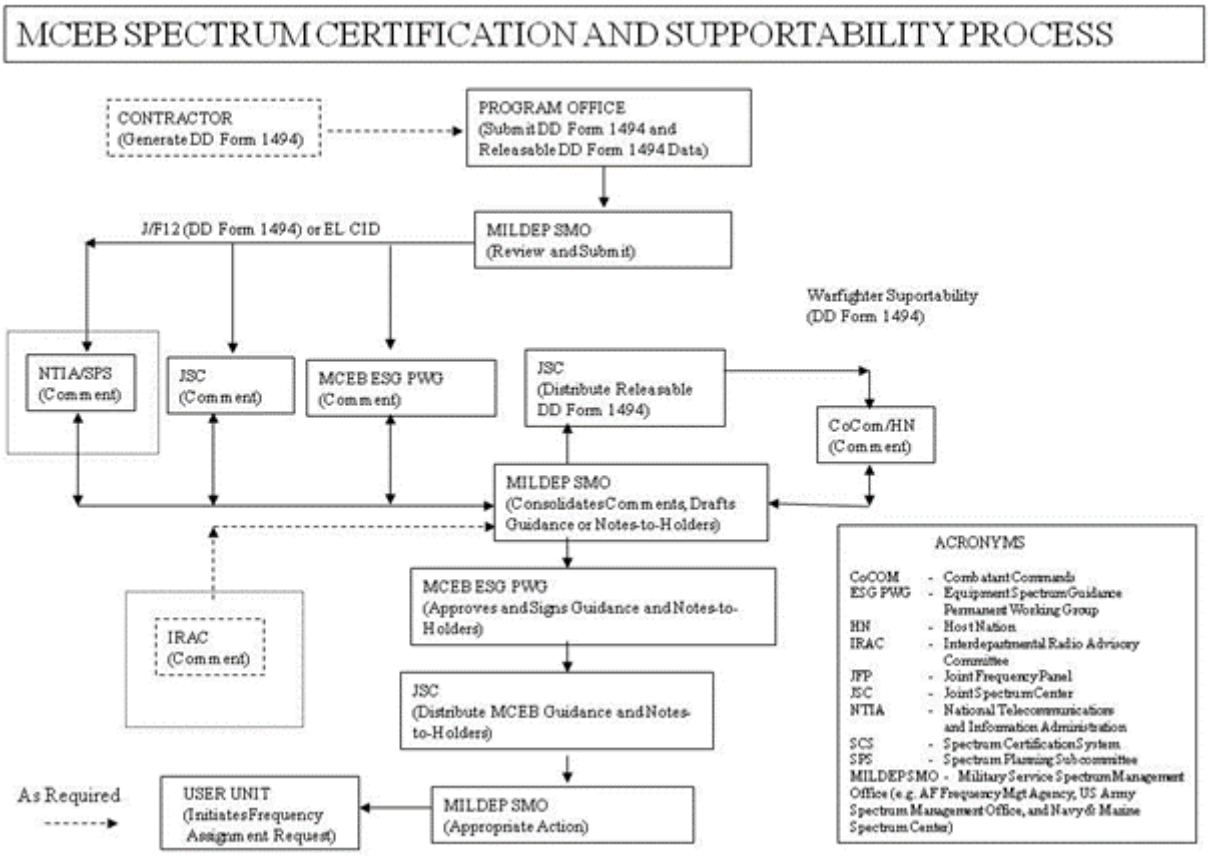
4.2. Allocation Tables. Frequency allocation tables provide the guidance for general EM spectrum use both nationally and internationally (each nation that manages their RF resources has a national table). The allocation tables delineate proper use of the spectrum by the type of service (i.e., fixed service, aeronautical mobile service, etc.). Every effort should be made to ensure equipment design, and use of the EM spectrum by the system is in accordance with the allocation tables (e.g., planned frequency use matches preexisting station classes in those bands). Specific exemptions can be made for operation outside of designated bands providing that the system be coordinated with the appropriate governing body and proof that the system will cause no harmful interference. Use of non-federal bands must be justified (beyond cost and convenience) and assessed to guarantee non-interference to the current and future systems operating in that band. Justification consists of two parts: 1) why the non-allocated frequencies are needed in the first place; and 2) how the system will operate in the requested band(s) without causing harmful interference to systems operating in established services.

4.2.1. Out-of-Band Operations.

4.2.1.1. Within the continental Untied States (CONUS). If an out-of-band justification is accepted by the NTIA for the system, system certification and use will be on a strict non-interference basis (NIB), not only to systems presently operating in the established services, but to any future systems operating in established services that may be certified at some later date. Systems that do not comply with the US Table of Frequency Allocations, with an out-of-band justification acceptable to NTIA, may be permitted to operate on an unprotected, NIB. Lacking such justification, programs should not expect NTIA certification for such non-compliant systems.

4.2.2. Outside the continental United States (OCONUS). Out-of-band justifications are host nation dependant and are coordinated via the Combantant Command responsible for that reason or area of operation.

Figure 4.1. Spectrum Certification Flowchart.



4.3. EMC Standards. AF agencies developing, procuring, or modifying equipment using the EM spectrum must do everything possible to meet applicable international, national, military, and HN EMC standards. Noncompliance may result in the denial of frequency authorization or severe operational restrictions. Furthermore, the penalty for nonconformance to the EMC standards set forth by the NTIA are described in chapter 5, section 5.1.2, *Consequences of Non-conformance with the Provisions of this Chapter*: "In any instance of harmful interference caused by nonconformance with the provisions of this chapter, the responsibility for eliminating the harmful interference normally shall rest with the agency operating in nonconformance."

4.3.1. National EMC Standards. The NTIA Manual contains the RF Spectrum Standards. All C-E systems will comply with the standards in the NTIA Manual. If compliance is not technically possible, proof that noncompliance will not cause unintended EM interference (EMI) is required. Operations may be authorized on a non-interference basis. The NTIA Manual states, "In any instance of harmful interference caused by nonconformance with the provisions of this chapter, the responsibility for eliminating the harmful interference normally shall rest with the agency operating in nonconformance."

4.3.2. Military EMC Standards. Include military EMC standards in equipment design specifications according to the EMC guidance and DoD 4120.24-M, *Defense Standardization Program (DSP) Policies and Procedures*. Request waivers to EMC standards through program management channels according to DoDD 3222.3/AFPD 33-5, *Department of Defense Electromagnetic Compatibility Program (EMCP) (Air Force Electromagnetic Environmental Effects Program).*

4.3.3. HN EMC Standards. HN authorities consider HN EMC standards during the DD Form 1494 coordination process.

4.4. Equipment Exempt from Spectrum Certification. The following categories of equipment in the US&P are exempt from the spectrum certification process. If any devices listed below are to be used outside US&P, spectrum certification may be required by the HNs prior to procurement.

4.4.1. CFR Title 47 U.S.C., Part 15, *Radio Frequency Devices*. This manual includes equipment procured or developed for federal use, that meet Part 15 (or NTIA Manual, Annex K) standards despite not having FCC Part 15 certifications, as specified in Sections 7.8 and 7.9 of the NTIA Manual. Refer to Section 4.2 of this instruction for additional information.

4.4.2. CFR Title 47 U.S.C., Part 18, *Industrial Scientific and Medical Equipment*.

4.4.3. CFR Title 47 U.S.C., Part 95, *Personal Radio Services*.

4.4.4. RF devices and built-in test equipment that does not exceed the technical criteria outlined in the NTIA manual with the exception of GPS re-radiating equipment.

4.4.5. Signal generators.

4.4.6. Bench test or antenna-testing equipment.

4.4.7. Electronic fuses that activate detonation devices.

4.4.8. Unmodified COTS Family Radio Service (FRS) transceivers.

4.4.9. Unmodified COTS Citizens' Band radios and low power radios that operate for short distances on the frequencies 27575 and 27585 kilohertz (kHz).

4.4.10. Unmodified COTS low power cordless telephones.

4.4.11. COTS cellular telephones used to access a commercial service provider.

4.4.12. International Maritime Satellite (Inmarsat™) terminals.

4.4.13. Airborne Radio Telephone System radios that operate on leased channels in the 800 megahertz (MHz) band.

4.4.14. Infrared and ultraviolet systems used, among other things, to measure heat intensity and spectral signatures of various targets.

4.4.15. Lasers and other systems that operate above 3000 gigahertz (GHz).

4.4.16. Global Positioning System receivers universally marketed for civil, industrial, private, and/or military applications.

4.4.17. Radio receivers used for reception of radio navigation signals from licensed ground stations, such as Distance Measuring Equipment (DME), VOR, ILS, etc.

4.4.18. Unmodified COTS airborne transceivers certified and registered for radio navigation operations within the civil national and international airspace management systems.

4.4.19. Radio and radar control heads, buss units, and software/hardware devices that interface with transmitting and receiving equipment but, by themselves, do not radiate or receive EM energy, except RF modem devices.

4.4.20. Requirements for systems submitted directly to AFSMO for processing that are not owned by an agency of the military service (e.g., radio, radar, and telemetry sets), but are owned by or leased from a contractor or provider, and those networks owned or leased by the contractor or provider to meet any corporate requirements.

4.5. Spectrum Application Submission. Using activities, program/project offices, or acquisition activities must generate and submit either a DD Form 1494 or an Equipment Location-Certification Information Database (EL CID) file to their local system centers, logistics centers, installation, or facility SMO for further processing in support of the development, modification, or acquisition of wireless RF devices including COTS, government-off-the-shelf, or non-developmental items. Data for the application can be obtained from the originator through any available sources, i.e., contractor support, manufacturer, etc. The local SMO will submit a complete and accurate application to their applicable MAJCOM SMO. The MAJCOM SMO will then send the completed application directly to AFSMO/DON. Using activities, program/project offices, or acquisition activities without local or MAJCOM SMOs will submit the application directly to AFSMO/DON.

4.5.1. Spectrum support application is processed in stages that closely parallel standard AF acquisition milestones via four stages. The System Program Office (PO), with contractor support, submits the DD Form 1494 or an EL CID file for the appropriate stage as it matures into an operational status. These four stages are:

4.5.1.1. Stage 1. Conceptual: Initial system planning has been completed. This stage advises on the feasibility of getting spectrum support and recommends modifications or changes in frequency bands.

4.5.1.2. Stage 2. Experimental: Preliminary system design has been completed. Certification at this stage provides guidance for assuring spectrum support in later stages, and is needed before obtaining frequency assignments for experimental testing.

4.5.1.3. Stage 3. Developmental: Major system design has been completed. As the system design is nearly finalized, this stage provides guidelines for assuring spectrum support needed before obtaining frequency assignments for developmental testing.

4.5.1.4. Stage 4. Operational: System development is complete. Certifies availability of spectrum support and identifies operating restrictions before making operational frequency assignments.

4.5.2. DD Form 1494 or an EL CID submissions: Submit DD Form 1494 or EL CID application for each stage of development using the lead times found in Table 4.1. below:

Table 4.1. Submission Lead Times.

	Space Systems	**Other Systems**
Stage 1 (Conceptual)	Not earlier than seven years and not later than (NLT) two years before satellite launch.	Not less than one year before initial testing begins.
Stage 2 (Experimental)	Not less than one year prior to planned operation.	Not less than one year before procuring equipment.
Stage 3 (Developmental)	No later than three years before satellite launch.	Not less than one year prior to the Milestone B Decision or contractual obligations for development, or modification activities involving wireless RF devices.
Stage 4 (Operational)	No later than two years before satellite launch.	Not less than nine months prior to the Milestone C Decision or contractual obligations for operational procurement or acquisition activities involving wireless RF devices.

4.6. Note-to-Holder (NTH). Use the MCEB NTH for amendments and updates to approved DD Form 1494 or EL CID file documents and MCEB memoranda. Send requests for NTH through established frequency management channels to the AFSMO.

4.7. Acknowledgment of MCEB Guidance. The PO or using activity must acknowledge receipt of the MCEB guidance within 60 duty or business days of receipt and notify the supporting MAJCOM of any concerns. Silence is concurrence.

4.8. Additional Guidance for use Outside the US&P.

4.8.1. Foreign Disclosure. Obtain foreign disclosure approval in advance of coordinating HN spectrum support for AF systems designed or planned to operate outside the US&P. The field-level foreign disclosure office (FDO), the MAJCOM FDO, or the SAF/IAPD disclosure office provides disclosure guidelines according to AFI 16-201, *Air Force Foreign Disclosure and Technology Transfer Program*.

4.8.1.1. Mark the DD Form 1494 Foreign Coordination page with the appropriate release statement provided by the FDO. Reference AFI 16-201, Section 4.4.2.2 for specific language.

4.8.1.2. The local SMO ensures that foreign disclosure approval is obtained, including the field-level FDO case number and provides a copy of the approval release with the DD Form 1494 through the chain of command to AFSMO. If field level disclosure approval is not received due to lack of delegated disclosure authority at the field level, notify the MAJCOM SMO.

4.8.1.3. HN Coordination. Each government has its own rules for using the spectrum. US military use of the spectrum has varying priority from nation to nation. Submitters must consider US forces that are garrisoned in other nations and must use

equipment on a day-to-day basis for training. Equipment that has not obtained HN approval is not authorized for use. This loss of capability can have serious mission impact.

4.8.1.3.1. Similar to the US process, the submitters of DD Form 1494s coordinate with their local spectrum manager in preparing the HN coordination package. The process for gaining authorization to use equipment in other nations is separate and distinct from the US procedure. All equipment that will be used by deploying or garrisoned forces in another nation must obtain spectrum support using the HN coordination process. The processing time for this HN coordination can take from months to years.

4.8.1.3.2. To ensure timely program implementation, HN coordination should begin with sufficient lead time to allow for completion of the coordination process prior to operational deadlines.

4.8.1.3.3. Contents of the HN Coordination Package. A submission package that is separate from the US package must be prepared. The first step is to determine the locations where the equipment will likely operate. Each nation is aligned under a COCOM AOR IAW the Unified Command Plan. The COCOMs have unique processes and some require more detailed information than others. However, any HN coordination package requires a Foreign Disclosure Letter be submitted to AFSMO.

4.8.1.3.4. Foreign Disclosure Letter. Determine the locations where the equipment will be used. If this determination is uncertain, use the best approximation available. The data on a DD Form 1494 must be deemed releasable to these nations. To begin the process, the submitter must coordinate the DD Form 1494 with the appropriate AF FDO. The appropriate MAJCOM FDO will determine whether the information contained on the DD Form 1494 is releasable. If the FDO cannot make the decision, the DD Form 1494 will be forwarded through the disclosure channels to SAF/IAPD. Once foreign disclosure is granted, the submitter of the DD Form 1494 must provide a letter indicating the release approval including the case number to their local SMO with the foreign coordination DD Form 1494 package. The releasable data must accompany the appropriate foreign disclosure release letter. The foreign disclosure release letter indicates the nations that can receive the different data. Alternatively, the FDO may specify that the DD Form 1494 may not be released to a HN for spectrum supportability coordination, but that individual data items may be released to that nation for the purpose of coordinating frequency assignments for operations within the country.

4.8.1.3.5. HN Coordination Package. AFSMO will review the HN coordination request. Once the United States Air Force (USAF) HN coordinator at AFSMO has approved, the request will be uploaded to HN Spectrum Worldwide Database Online (HNSWDO) for further review by the MCEB ESG Steering Member. Once the ESG Steering Member has approved release of the request to COCOM for HN coordination, AFSMO will upload the MCEB cover letter for the request to HNSWDO. AFSMO will then release the request to COCOM for coordination

of the request with HNs as specified. This coordination ends with HN comments being received by COCOM and entered into HNSWDO for review by AFSMO. With the DoD acceptance of HNSWDO as the official HN coordination database, HN comments no longer are included in NTH requests for appendage of such comments to MCEB memos. Instead, these comments can be approved directly by AFSMO in HNSWDO, as AFSMO is authorized to accept HN comments on behalf of the USAF. HNSWDO serves as the repository for all HN comments received by COCOMs.

4.8.1.3.6. Unique HN Coordination. Some countries may have unique HN process for example Japan and Korea. These countries do not allow equipment to be coordinated for possible future deployments. Coordination for notional equipment use is not permitted. As a result, HN coordination with Japan and Korea has an associated timeline of 90 duty days after HN comments are received to submit a frequency proposal. If no frequency proposal is submitted in that time frame then the HN coordination will have to be reinitiated.

4.8.1.3.7. Submission Procedures. As in the DD Form 1494 process, the submitter's local spectrum manager will distribute the completed HN coordination package to the spectrum manager in the next level of the chain of command. AFSMO will provide the foreign coordination package to the MCEB for tasking to the appropriate COCOM, or to the Defense Attaché Office for foreign coordination.

4.9. SPS Review. All major systems used in the US receive MCEB review and NTIA certification. AFSMO determines which DD Form 1494s or EL CID files require SPS review, with the exception that the systems listed below must go through SPS review. ***NOTE:*** As of November 1, 2009 all spectrum certification applications submitted to the SPS by AFSMO are required to be in EL CID format.

4.9.1. New systems or subsystems and major modifications to existing systems, including all systems operating in the space services or radio determination (radiolocation, radionavigation) services.

4.9.2. All new systems or subsystems and major modifications to existing systems previously reviewed by the SPS if there is a significant impact on the EM spectrum when considering geographical location and frequency availability.

4.9.3. Land mobile radio (LMR) trunked systems.

4.9.4. Other systems or facilities that the NTIA, Interdepartment Radio Advisory Committee (IRAC), or other government agencies refer to the SPS.

4.9.5. Systems referred for SPS submission by the MCEB FP ESG Permanent Working Group (PWG).

4.10. Spectrum Supportability Risk Assessment. Certification of spectrum support shall be obtained as required prior to authorization to operate. An integral part of this process is the Spectrum Supportability Risk Assessment (SSRA). SSRA suggested tasks are listed in DoDI 4650.01, Enclosure 3, Table 2.

5. Frequency Actions.

5.1. Frequency Assignment Guidance. The installation commander can prohibit use of any RF emitter (cease and desist) when anticipating or resolving interference to mission essential S-D equipment. All RF emitters must have a frequency assignment prior to operation. Before making a permanent assignment, the MCEB must review the RF equipment via a DD Form 1494 unless specifically exempted in paragraph 2.4. Before making a temporary assignment or special temporary authorization a DD Form 1494 must be submitted to AFSMO and a J/F-12 number assigned. Frequency assignment parameters must match the technical characteristics of the equipment as listed in the DD Form 1494 or as recommended in the MCEB guidance (reference Attachment 6, *Frequency Actions*).

5.2. Types of Frequency Assignments. There are three types of frequency assignments:

5.2.1. Permanent: A frequency assignment for an unspecified period of time; however, a periodic review of the assignment is required. Permanent assignments will have a SFAF Item 142 (review date).

5.2.2. Temporary: A frequency assignment for a specified period of time, more than 90 calender days but less than five years. Temporary assignments with a SFAF Item 141 (expiration date) may be renewed for additional periods, if necessary. Coordinate this type of assignment at the national level and submit to the FAS for approval and recommendation to the NTIA for assignment. The assignment with an appropriate expiration date is entered into the Government Master File (GMF).

5.2.2.1. Special Temporary Authorization (STA): AF users may apply for a STA for up to 30 calender days. This type of temporary assignment is not entered into the GMF. STAs should be limited to urgent/no-notice requirements.

5.2.3. Group: A frequency assignment made only to terrestrial stations and provides authority to operate but does not represent continuing operations, or provide an assignment for planning purposes. There are two types:

5.2.3.1. Authority to operate - this type does not represent continuing operations. ***NOTE:*** S322 shall be used in SFAF line number 500.

5.2.3.2. Planning - this type represents continuing or definitely anticipated requirements. ***NOTE:*** S321 shall be used in SFAF line 500. The following applies to such assignments:

5.2.3.2.1. Such assignments shall not exceed three years.

5.2.3.2.2. The technical particulars of these assignments shall describe the intended use of the frequency to the maximum extent practical at the time of this application.

5.2.3.2.3. Operations conducted under the authority of this type of assignment shall be limited to such uses as site surveys and path testing associated with the intended use. This type of assignment shall not be considered operational but strictly as a planning assignment set aside to satisfy an identified future requirement. However, all S321 assignments are accorded protection and may be coordinated with Canada at the option of the applicant.

5.3. Frequency Applications. An application is used for the following frequency assignment actions (SFAF 010):

5.3.1. New (N): To apply for a new frequency assignment.

5.3.2. Modification (M): Used to apply for the addition, subtraction, or removal of information contained in an existing frequency assignment.

5.3.3. Serial Replace Action (N): Used to delete an existing assignment from GMF and simultaneously replacing it with a new one.

5.3.4. Renewal (R): To apply for the extension of a TEMPORARY assignment and to simultaneously update other particulars of the assignment.

5.3.5. Administrative (A): This action is similar to a Modification (M) action; however, it is used to make three specific types of changes. The review date (Data Item 142) will not be automatically changed if an Administrative Modification action is used.

5.3.5.1. Changes due to typographical errors in the authorizing document.

5.3.5.2. Changes in administrative data items (e.g., 200 series).

5.3.5.3. Mass changes required for compliance with international, national, or DoD rules and regulations.

5.3.6. Deletion (D): To apply for the cancellation of a frequency assignment and the removal of all its particulars from the GMF and FRRS database.

5.3.7. Temporary (N): To apply for a STA.

5.4. Lead-times. Lead-times provide federal agencies and overseas commands and host countries with the time necessary to coordinate and process applications for frequency actions. If the following lead-times are not met, the frequency request must include a mission impact statement if the assignment is not granted by the date requested. Limit such requests to safety of life or urgent matters of national security. In all cases, requesting commands must provide justification/operational impacts statements when the requirement does not meet the required lead-time.

5.4.1. AFSMO lead-times for operations in the US&P. The lead-times below start when AFSMO receives the request and does not include time required by the MAJCOM or intermediate agencies.

5.4.1.1. Permanent Assignments. Sixty (60) business days. In most cases, additional lead-time is required for actions requiring coordination with the FCC or the FAA. Requirements that are not in accordance with the national table of allocations, or have unusual technical parameters, may require additional engineering time or study. It is not uncommon for such requests to take more than six months at the national-level.

5.4.1.2. Temporary and Group Assignments. Sixty (60) business days. These assignments are described as those temporary assignments requiring more than 90 calender days but less than five years for entry into the GMF. Additional lead-time is needed for all actions requiring coordination with the FCC or FAA. Requirements not in accordance with the national table of allocations, or have unusual technical

parameters may require additional engineering time or study, consequently requiring even longer lead-times.

5.4.2. For operations outside the US&P. Unified commands set lead-times for frequency actions based on agreements with host governments. Generally, theater COCOM JFMOs require a minimum of 90 business days lead-time to process overseas requirements. The 90-day time starts when the COCOM JFMO receives the request. Refer to theater instructions for specific lead-times.

5.4.2.1. **(Added-USAFE)** Temporary assignments within the EUCOM and AFRICOM AOR require 90 days of lead-time. This lead-time starts when the USAFE-AFAFRICA SMO receives the request. Additional time must be allotted to ensure the request is processed through the ISM.

5.4.2.2. **(Added-USAFE)** Permanent assignments within the EUCOM and AFRICOM AOR require 180 days of lead-time. This lead-time starts when the USAFE-AFAFRICA SMO receives the request. Additional time must be allotted to ensure the request is processed through the ISM.

5.5. Frequency Coordination. The DoD does not own spectrum exclusively for military use. In fact, spectrum is not owned by any organization, it is "allotted" and assigned. The DoD, through the Military Assignment Group (MAG), manages the spectrum between 225 MHz through 328.6 and 335.4 MHz through 399.9 MHz for the federal government (NTIA). When it is necessary for the AF to use frequencies managed by another federal department or agency, the AF must coordinate with the appropriate agency prior to submitting a frequency request to the NTIA for assignment action. Coordinate frequency actions as outlined in paragraphs 3.5.1 through 3.5.9 and include a statement of completed coordination and comments with the frequency action.

5.5.1. FCC. Refer to the NTIA Manual for the civil frequency bands requiring coordination. AFSMO completes final coordination with the FCC national office before submitting the request to the FAS for assignment action.

5.5.2. FAA. The FAA manages certain frequency bands through the Aeronautical Assignment Group (AAG), a working group of the FAS. Coordination with the FAA Service Area is required for all new and existing assignment modifications with changes in technical parameters prior to submitting the proposal to the AFSMO for national-level approval. AFSMO, a member of the AAG, completes final coordination with the AAG before submitting the request to the FAS for assignment action.

5.5.2.1. If after three attempts to coordinate with the FAA Service Area fails, add the following 520 SFAF line item: "Attempted coordination with (XXXX) regional office on (list dates) and have failed." Process this SFAF through AFSMO.

5.5.3. DoD AFC. Coordinate frequency actions at, among, and within radio LOS of ranges according to ACP 190 (US SUPP-1) and the NTIA Manual, Annex D.

5.5.4. Aerospace and Flight Test Radio Coordinating Council (AFTRCC). Coordinate all frequency requirements that fall within the 1435-1525 and 2360-2390 MHz band with the appropriate AFC prior to submission. The AFC coordinates with the AFTRCC coordinator.

5.5.5. Army. Coordinate all AF frequency requirements on an Army installation with the appropriate Army frequency coordinator prior to submission.

5.5.6. Navy. Coordinate all AF frequency requirements on a Navy installation with the appropriate Navy frequency coordinator prior to submission.

5.5.7. Canadian border. Coordination prior to assigning frequencies is required with Canada within 80 kilometers (km) (approximately) of the US/Canadian border for terrestrial communications requirements and 250 nautical miles (nmi) for aeronautical communications requirements. The NTIA coordinates the frequency proposal requirements with Canada. Refer to the NTIA Manual for specific guidance.

5.5.8. Mexican border. Coordination prior to assigning frequencies is required with Mexico within 75 km (approximately) of the US/Mexican border for terrestrial communications requirements and 250 nmi (approximately) for aeronautical communications requirements. The NTIA coordinates the necessary requirements with Mexico. Refer to the NTIA Manual for specific guidance.

5.5.9. Outside US&P. MAJCOMs coordinate frequency actions according to theater policies and procedures through the appropriate AF component command.

5.5.9.1. **(Added-USAFE)** Within the EUCOM and AFRICOM AOR normal frequency coordination flows are as follows:

5.5.9.1.1. **(Added-USAFE)** Units participating in in-garrison training, USAFE-AFAFRICA directed exercises or missions, or requiring permanent frequency requirements will submit all frequency requirements to their ISM. The process will then flow from the ISM to the USAFE-AFAFRICA SMO, from the USAFE-AFAFRICA SMO to EUCOM FMO (EUCOM/ECJ63) and from EUCOM FMO to HN. Information flows in reverse order upon approval or denial of request.

5.5.9.1.2. **(Added-USAFE)** Units participating in AFFOR-directed exercises, contingencies and wartime operations will submit all frequency requirements to their ISM. The process will then flow from the ISM to the USAFE-AFAFRICA SMO, from the USAFE-AFAFRICA SMO to EUCOM FMO (EUCOM/ECJ63) and from EUCOM FMO to HN. Information flows in reverse order upon approval or denial of request.

5.5.9.1.3. **(Added-USAFE)** Units conducting exercises or missions within the AFRICOM AOR will submit all frequency requirements to their ISM. The process will then flow from the ISM to the USAFE-AFAFRICA SMO, from the USAFE-AFAFRICA SMO to AFRICOM FMO (AFRICOM/J63) and from AFRICOM FMO to HN as applicable. Information flows in reverse order upon approval or denial of request.

5.6. Frequency Application and Approval Channels.

5.6.1. AF Organizations in the US&P.

5.6.1.1. ISM. The ISM is responsible to the installation commander for managing all frequency use on the installation. Therefore, all units/organizations assigned to the installation submit their frequency applications/requirements to the ISM. The ISM will:

5.6.1.1.1. Submit proposals for host installation units to the host MAJCOM.

5.6.1.1.2. Submit proposals for tenant units supporting the host installation mission to the host's and tenant's MAJCOMs respectively.

5.6.1.1.3. Submit proposals for tenant units not supporting the host installation mission to the supported unit's MAJCOM with a copy to the host and tenant unit MAJCOMs, e.g., as described below:

5.6.1.1.3.1. Submit frequency requirements for a HQ ACC maintenance expediter net on a Headquarters Air Mobility Command (HQ AMC) installation to HQ ACC with a copy to HQ AMC.

5.6.1.1.3.2. Submit frequency requirements for a HQ AFMC unit in support of HQ ACC on a HQ AMC installation to HQ ACC with a copy to HQ AFMC and HQ AMC.

5.6.1.2. ANG and Headquarters Air Force Reserve Command (HQ AFRC) units will:

5.6.1.2.1. Submit actions to support day-to-day operations, training requirements, fixed ATC, and navigational aids (NAVAIDs) at operating bases and permanent training sites, through appropriate channels to the ANG Readiness Center (ANGRC) or HQ AFRC, respectively. The ANGRC or HQ AFRC sends the actions to AFSMO.

5.6.1.2.2. Submit requests in support of exercise or readiness inspections through the tasking agency to AFSMO.

5.6.1.2.3. The ANG units will submit actions to support state-levied mission requirements through their State Level Joint Force Headquarters (JFHQ-J6 Spectrum Manager's Office) for action, then route a copy to National Guard Bureau (NGB) (HQ ANG-A6 Operations) for necessary adjudication. The Adjutant General (TAG) endorses JFHQ-J6 Spectrum Manager Directives and routes them to FCC Safety and Special Radio Services Bureau.

5.6.1.3. MARS activities:

5.6.1.3.1. Submit actions for MARS VHF nets on a military installation or on outlying locations hosted by an installation through the host ISM to the host MAJCOM. MAJCOMs coordinate with the Chief, USAF MARS (AFNIC/ESLI, 203 West Losey Street, Room 3100, Scott AFB IL 62225-5222) to ensure the net is authorized before sending the action to AFSPC who in turn will submit to AFSMO.

5.6.1.3.2. Civilian affiliate stations send frequency actions to the state MARS director. The state MARS director sends actions to the region communications manager, who, in turn, sends it to the Chief, USAF MARS (AFNIC/ESLI). If approved, the Chief, USAF MARS sends the frequency action through AFSPC to AFSMO.

5.6.1.3.3. The Chief, USAF MARS and AFSPC coordinate HF actions. HF assignments are made on a regional basis. The authority for station operation is found in AFI 33-106, *Managing High Frequency Radios, Personal Wireless*

Communication Systems, and the Military Affiliate Radio System. No formal action is required.

5.6.1.3.4. **(Added-USAFE)** The USAREUR SMO is the POC for all MARS usage and frequency assignments within the EUCOM AOR.

5.6.1.4. Civil Air Patrol (AFAUX/CAP). The CAP is an auxiliary of the AF under Title 10 U.S.C., *Armed Forces*, Chapter 909, *Civil Air Patrol*. AFI 10-2701, *Organization and Function of the Civil Air Patrol*, outlines AF support to the AFAUX/CAP. CAP units submit frequency actions that support AF operations and training, whether in whole or in part, to AFAUX/CAP National Headquarters (AFAUX/CAP-DOSF), 105 South Hansell Street, Maxwell AFB AL 36112-6332. AFAUX/CAP National Headquarters sends the frequency actions to HQ AETC CSS/SCMC, 61 Main Circle, Suite 3, Randolph AFB TX 78150- 4546, who in turn, sends them to AFSMO.

5.6.1.4.1. AFSMO may assign AFAUX/CAP frequencies for AF units to communicate with the AFAUX/CAP during operational missions.

5.6.1.4.2. AF units may allow AFAUX/CAP to use their assigned frequencies to communicate with other AF units during operational missions.

5.6.1.4.3. AFAUX/CAP units give the ISM a list of frequencies used on the installation. A number of these should appear in the installation data pull.

5.6.2. AF Organizations Outside the US&P. Overseas units submit frequency requests according to unified command policy. The geographical COCOM is responsible for military use of frequencies within the command's geographical area.

5.6.2.1. **(Added-USAFE)** USAFE-AFAFRICA units will submit frequency requests through their ISM or USAFE-AFAFRICA SMO as appropriate. Visiting units from outside the Command must route frequency requests through the appropriate MAJCOM for forwarding to USAFE-AFAFRICA SMO.

5.6.2.2. **(Added-USAFE)** AFN frequency management is the responsibility of USAREUR SMO. All AFN requests or requirements within the EUCOM AOR must be routed through USAREUR SMO.

5.7. Contractor Use of Frequencies.

5.7.1. AF Contracts. Contractors must submit frequency requests in direct support of AF contracts through the AF representative (normally the ISM if on an AF base or if at an Acquisition Center, the PO responsible for the contract), to the MAJCOM responsible for administering the contract. The contractor must obtain frequency assignments from the FCC for requirements not in direct support of the contract.

5.7.2. Multiple Service Contracts. Contractors must submit frequency requests in support of a multiple service contract through the appropriate spectrum management channels to the military department that is the executive service for the contract. The contractor must obtain frequency assignments from the FCC for requirements not in direct support of the contract.

5.7.3. Foreign Military Sales (FMS), Direct Commercial Sales (DCS), and Hybrid programs. If the intention is to radiate within the US&P, requirements must go through the US&P process (e.g., certification and assignment). However, Hybrid programs will be handled case-by-case.

5.8. Shared-Use Facilities. Users submit frequency requests for shared-use facilities through the spectrum management channels of the agency that owns the mission requirement.

5.9. Joint Bases. With the implementation of Joint Bases throughout DoD, the following is provided for those AF units designated as the lead service to provide spectrum management support for a Joint Base. Table 5.1 lists all of the locations currently affected by the Joint Basing program and the identified lead service designated to provide overall spectrum management support for those locations:

Table 5.1. Joint Base Locations.

Joint Base Installations	Lead Service
Naval Station Pearl Harbor/Hickam AFB, HI	Navy
Navy Base Guam/Andersen AFB, Guam	Navy
Anacostia Annex/Bolling AFB, District of Columbia	Navy
Naval Amphibious Base Little Creek/Ft Story, VA	Navy
Ft Lewis/McChord AFB, WA	Army
Ft Myer/Henderson Hall, VA	Army
Charleston AFB/Naval Weapons Station Charleston, SC	Air Force
McGuire AFB/Ft Dix/Naval Air Engineering Station, Lakehurst, NJ	Air Force
Andrews AFB/ Naval Air Facility Washington	Air Force
Elmendorf AFB/Ft Richardson, AK	Air Force
Lackland AFB/Randolph AFB/Ft Sam Houston, TX	Air Force
Naval Air Station Fort Worth Joint Reserve Base	Navy

5.9.1. The Lead Service will designate a spectrum management office (SMO) to provide SM support of the Joint Base electromagnetic environment (EME). The Military Services will ensure that the Joint Base SMO is cognizant of their S-D equipment/systems within the boundaries of the Joint Base and the operators of any S-D devices obtain and maintain frequency assignments for those systems.

5.9.1.1. The Joint Base SMO will process Joint-Service temporary and permanent frequency actions through established channels.

5.9.1.2. In Joint Base environments, the Services are responsible to:

5.9.1.2.1. Pre-coordinate all temporary and permanent frequency proposals with the Joint Base SMO prior to submission to the national-level for processing.

5.9.1.2.2. Conduct periodic reviews of their frequency assignments and pre-coordinate updated information with the Joint Base SMO prior to submission to the national-level for further processing.

5.9.1.2.3. Obtain an approved equipment certification prior to submitting any frequency proposal. Equipment certification is obtained using the DD Form 1494,

Application for Equipment Frequency Allocation.

5.10. Frequency Review Program. The purpose of the Frequency Review Program is to ensure the GMF and FRRS accurately reflect current operations. Users should submit reviews NLT 90 business days before the expiration date shown in the frequency assignment record and is updated by the review date.

5.10.1. **(Added-USAFE)** When conducting frequency assignment reviews, use the USAFE-AFAFRICA Frequency Assignment Review Checklist as a guide (Attachment 10, added) ISMs must send all the review information to USAFE-AFAFRICA SMO for processing.

5.11. Non-licensed Devices. A non-licensed device is a low power intentional, unintentional, or incidental radiator or device that meets the technical specifications prescribed in CFR Title 47 U.S.C., Part 15, or the NTIA Manual, Annex K. Non-licensed devices are afforded no protection from interference; if interference is caused to an authorized service the non-licensed device must cease operation. Because of this, AF activities must exercise caution in procuring and using non-licensed devices. Examples of non-licensed devices are wireless local area networks, wireless microphones, and cordless telephones. Using activities are strongly advised not to use non-licensed devices for critical command and control applications essential for mission success, protection of human life, or high value assets. It is highly recommended that frequency registration be coordinated and documented at the local spectrum management level when the device directly supports an AF mission.

5.12. Frequencies Not Requiring Specific Assignment. International distress and emergency frequencies do not need specific assignments for use. Table 6.2 lists frequencies not requiring assignment for use in the US&P. Outside the US&P, theater commanders and HNs determine frequencies that do not need specific assignment.

5.12.1. **(Added-USAFE)** When operating within the EUCOM and AFRICOM AOR, the only frequencies that do not require a specific assignment for US forces are those emergency and distress frequencies defined in ITU Radio Regulation Article 31.

5.13. Emergency Frequency-Sharing Notification. Under emergency conditions, several government agencies (i.e., Federal Emergency Management Agency operations) may operate on, or near, frequencies assigned to AF organizations. When this occurs, one of the involved agencies should coordinate with the affected AF organization to arrange frequency sharing during the emergency. AF units will cooperate fully during emergencies unless frequency sharing would jeopardize mission-essential operations. To properly coordinate at the national level, a representative for the local AF units must up-channel the information concerning the emergency situation. Ideally, this information should flow through command channels to notify AFSMO.

5.14. Air Force Spectrum Interference Resolution (AFSIR) Program. EMI is any EM 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. The AFSIR program, discussed in AFI 10-707, contains guidance for units experiencing EMI that must be resolved on a case-by-case basis. The 85th Engineering Installation Squadron (85EIS), Keesler AFB, MS can provide technical

assistance to AF units to resolve interference. Units that experience interference and require on-site assistance may request Quick Fix Interference Reduction Capability assistance IAW AFI 10-707.

6. Guidance for Specific Cases of Frequency Usage.

6.1. General. This chapter lists permissible frequency usage within the US&P. Unless otherwise noted, frequency assignments are necessary for the specific frequencies.

6.2. Non-Licensed/Annex K Devices. The Purchase and Use of Federal and FCC Non-Licensed Devices is outlined in Para 7.8 of the NTIA Manual. The following AF caveats and warnings apply:

6.2.1. AF activities are strongly advised not to use non-licensed equipment for critical tactical or strategic command and control applications essential for mission success, protection of human life, or protection of high-value assets, as they offer no protection of spectrum use in support of operational requirements. Non-licensed devices operate on a not-to-interfere basis, which includes accepting interference.

6.2.1.1. Upon notification by cognizant spectrum management personnel that the device is causing interference, the operator of the non-licensed device shall cease all radiation from the device until the interference is eliminated.

6.2.1.2. Users will not modify, modernize, enhance, or change the equipment's power, antenna, waveform, or information transfer characteristics in any manner that would cause it to violate the NTIA criteria for non-licensed devices or the device's FCC type certification.

6.2.2. US&P Operations. Non-licensed devices (e.g. devices meeting CFR Title 47 U.S.C, Part 15) operating within the US&P do not require NTIA certification or an approved NTIA frequency assignment; however, the DoD requires a frequency assignment registered in the FRRS and either a J/F-12 or an EL CID file is necessary for information purposes. This is accomplished through the local SMO.

6.2.3. Outside US&P Operations. Theater commanders and HNs decide if frequency support is available and the requirements for frequency assignments. Users must submit a DD Form 1494 through the supporting spectrum manager for equipment that intentionally radiates and will be deployed outside the US&P. After obtaining favorable HN guidance, users may request frequency assignment. US non-licensed devices, like wireless phones, baby monitors, or walkie talkie radios require HN approval to operate.

6.2.3.1. **(Added-USAFE)** US (FCC) approved non-licensed devices are not approved for usage within the EUCOM and AFRICOM AOR. The majority of these devices (i.e. baby monitors, wireless phones, or walkie talkie radios) will cause harmful interference to HN emergency responders and should not be used in this AOR.

6.2.3.1.1. **(Added-USAFE)** Any such device that requires usage within Germany must have a COTS worksheet completed (Attachment 12) with an EU letter of conformity attached (Attachment 13). Forward completed paperwork to USAFE-AFAFRICA SMO for processing.

6.2.3.1.2. **(Added-USAFE)** Any such device that requires usage in all other

USAFE-AFAFRICA nations must be handled on a case by case basis thru USAFE-AFAFRICA SMO. Sole decision authority rests with the HN.

6.2.4. Use of Ionospheric Sounders. Reference paragraph 8.2.21 of the NTIA Manual. SFAF Instructions: in addition to the minimum information required in the SFAF include the following: pulses per channel, sweep rates, sweep intervals, pulse width (duration), PRR, antenna type, antenna orientation, and the statement, "No existing authorized ionospheric sounder system is capable of meeting this requirement." Also, include on line SFAF 500, special note - S383.

6.2.5. Chirpcomm™. Chirpcomm™ is a low-power, highly reliable message transmission capability system used in conjunction with sounders. The system sends nonsecure narrative messages up to 38 characters, with a two-character transmit station identifier. This subsystem supplements and sustains existing HF communications circuits by enhancing the sounder capability. However, EMC differs significantly from the sounder-only mode. You must consider potential interference to other HF circuits and meet the following conditions:

6.2.5.1. US military Chirpcomm™ systems are authorized only for critical or contingency requirements when standard methods of communication are not feasible.

6.2.5.2. Obtain specific frequency assignments for the Chirpcomm™ mode in addition to those for the chirpsounder.

6.2.5.3. AFSMO coordinates Chirpcomm™ systems within the US&P with the NTIA.

6.3. AF Considerations for use of HF in the Continental United States (CONUS). AF activities satisfy new requirements by using time and geographical sharing with existing assignments. The use of HF for domestic, point-to-point service within the CONUS is limited to the following:

6.3.1. For instantaneous transmission of emergency, command and control, and alerting traffic of such importance as to affect the immediate defense and survival of the nation. In such cases, the following apply:

6.3.1.1. To protect frequency assignments for such circuits according to the importance of the communications requirement.

6.3.2. When required for emergencies where life, public safety, or important property is jeopardized and other communications means are nonexistent, temporarily disrupted, or inadequate. Use a non-radiating (dummy) load as much as possible to test frequencies in this category. Keep tests using a radiating antenna to a minimum. Do not conduct operator training on these frequencies. These assignments are considered Category 2 assignments and will include record note L012 or L113.

6.3.3. When there is a need for a communications system staffed by fully qualified operators who are military reservists, MARS affiliates, or personnel in tactical or training systems. Do not use these frequencies for traffic routinely handled by other means. These assignments are considered Category 3 assignments and will include record note S012.

6.3.4. When other telecommunications facilities, such as the Defense Information Infrastructure (DII) and MARS, do not exist or are not practical for the installation and the use of frequencies above 30 MHz is not practical. These assignments are considered Category 4 assignments and will include record note S206.

6.4. VHF Air/Ground (30-50, 118-136, 138-144 MHz). VHF air-to-air and air-to-ground communications supports both ATC and tactical operations.

6.4.1. VHF ATC. VHF ATC operations are conducted in the 118-136 MHz band. The AAG controls these frequencies. The FAA considers normal ATC operations at a location to consist of: 1 ground, 1 local, 2 approach, 1 departure, and 1 Automatic Terminal Information Service (ATIS)/Automated Surface Observation System (ASOS)/Automated Weather Observation System (AWOS). ***NOTE*:** If additional frequencies are required, justification must be provided in SFAF Item 520. This justification will be considered by Headquarters (HQ) FAA to determine the need for the additional frequencies. All requirements must be coordinated first with the applicable FAA Service Area. A service volume must be included on all ATC assignments (SFAF Item 503). FAA Service Area coordination information must be listed in the Supplementary Details (SFAF Item 520). Additionally, in certain RF saturated regions not all normal ATC operations can be supported with a FAA VHF band assignment.

6.4.2. VHF Tactical Operations. VHF tactical operations are normally conducted in the 30-50 or the 138-144 MHz bands.

6.4.3. VHF Pilot to Dispatch. This function cannot reside in the 108-136 MHz frequency band. Place this function into the band of 138-144 MHz. Use 139.3 MHz when feasible, to standardize AF operations.

6.4.4. **(Added-USAFE)** VHF air-ground frequencies within the EUCOM and AFRICOM AOR are controlled and issued by HN. All USAF requirements must be routed through USAFE-AFAFICA SMO.

6.5. Ultra High Frequency (UHF) (225-399.9 MHz). The 225-399.9 MHz band, referred to as the UHF band, supports fixed, mobile, aeronautical radionavigation, and satellite operations. Assignments to support the various functions must be in accordance with the channeling plan. The following are various AF functions supported in the 225-399.9 MHz band:

6.5.1. Aeronautical Operations. Within the US&P, the MAG recommends assignment action used to support aeronautical operations. Frequencies are channeled in 25 kHz increments and must be used in accordance with the USMCEB-M-001-04, 225-399.9 MHz allotment plan. The use includes both air-to-air and air-to-ground operations. Typical uses include ATC, squadron operations, etc. When processing assignment requests for aeronautical operations, a service range and height must be included.

6.5.1.1. Air-to-Air Refueling. All frequencies used for air-to-air refueling must contain the track number, exit and entry points on the track, and the names of the sites with the track geographical coordinates.

6.5.1.2. ATC Frequencies. ATC frequencies are used solely to control the movement of aircraft. ATC services include approach control, departure control, clearance

delivery, en route control, ground control, and local control. The AAG controls all frequencies used for ATC and must coordinate prior to an assignment being made. ATC communications support is provided by military and civilian FAA certified facilities in direct support of the National Airspace System (NAS) and conducted under a MOU between the facility and applicable FAA Service Area. Coordination is required with the applicable FAA Service Area for all ATC requirements.

6.5.1.2.1. Communications between military stations and aircraft operating within a military operating area, after being handed over by FAA control, are not considered ATC operations.

6.5.2. Wideband Operations. Any bandwidth greater than 25 kHz is considered a wideband requirement. Frequencies used must conform to the designated wideband allotments in the UHF allotment plan.

6.5.2.1. Fixed Multichannel Radio Relay. Fixed multichannel radio relay is not permitted to operate in this band within the US&P, except for tactical exercises or training, or unless demonstrated that its use is the only effective way to satisfy a communications requirement. Multichannel radio relay is normally a duplex operation; therefore, make sure frequencies are requested for both locations.

6.5.3. Satellite communications. The 225-399.9 MHz band is used to support Fleet Satellite Communications (FLTSAT) and AF Satellite Communications (AFSAT). Per USMCEB-M-001-04, *Allotment Plan for the 225-399.90000 MHz Frequency Band*, Annex D provides the plan for satellite communications.

6.5.4. **(Added-USAFE)** UHF (225-399.9 MHz) air-ground frequencies within the EUCOM AOR are controlled and issued by NATO SMB. All USAF requirements must be routed through USAFE-AFAFICA SMO.

6.6. NAVAID Frequencies. NAVAIDs help provide safe and efficient operation of civil and military aircraft. All frequency assignments for NAVAIDs are under the control of the AAG and require FAA Service Area coordination except the long-range aid to navigation (LORAN) system. There are many radio frequencies used to support airfield operations at a typical AF installation. Periodically, the ISM should compare assigned frequencies against the DoD flight information publications (FLIP). Errors should be brought to the attention of the airfield manager so the FLIP can be corrected, or frequencies changed to those assigned. Aeronautical NAVAIDs and their allocated frequency bands are:

6.6.1. Low Frequency (LF) and Medium Frequency (MF) Non-Directional Beacons (NDB). Frequencies for LF or MF radio beacon operations range from 70 to 2000 kHz. AF NDBs normally operate in the 200-415 and 510-535 kHz band within the US&P. A Station Class of ALB, emission of 2K04A2A, and service volume (SFAF Item 503) are required for each proposal.

6.6.2. ILS. The ILS consists of three components: marker beacon, localizer, and glideslope. The ILS provides guidance for an aircraft on final approach to a runway. The runway number that the ILS will service must be documented in the frequency assignment.

6.6.2.1. Marker Beacon. The marker beacon operates on a standard frequency of 75 MHz. The marker beacon indicates a specific location along the final instrument approach. Station Class: ALA; Emission 6K00A2A.

6.6.2.2. Localizer. The localizer operates in the 108.1-111.95 MHz band and transmits horizontal guidance signals to direct the aircraft to the runway centerline. The localizer also transmits a Morse code airfield identifier consisting of the letter "I" followed by a Runway number (SFAF Item 503) and NAVAIDS Identifier (SFAF Item 304) that must be included in the proposal. Station Class: ALL; Emission 2K04A1A (without voice).

6.6.2.3. ILS Glideslope. The frequency band 328.6-335.4 MHz transmits vertical guidance signals for descent to the runway. The Glideslope is allocated for aeronautical radionavigation and is used to support ILS Glideslope. Glideslope and localizer frequencies are paired according to the channeling plan shown in the NTIA Manual. The AAG controls these assignments. Coordination is required with the applicable FAA Service Area for all ATC requirements.

6.6.3. Microwave Landing System (MLS). The MLS operates in the 5031-5090.7 MHz band and is the International Civil Aviation Organization (ICAO) approved replacement for the current ILS system. The MLS is based on time-referenced scanning beam, referenced to the runway, allowing aircraft to determine precise azimuth angle and elevation angle. The FAA engineers support the MLS and associated precision Distance Measuring Equipment (DME) operating in the band 972-1143 MHz.

6.6.3.1. Mobile Microwave Landing System (MMLS). The AN/TRN-45 is a tactical military precision approach and landing system that is compatible and interoperable with the national and international MLS systems. It is designed as a tactical landing guidance for military aircraft and provides azimuth, elevation data, and range information at off-base landing sites. The AN/TRN-45 has two transmitters. The first transmitter is in the 979-1143 MHz frequency range and is used for DME. A second transmitter is in the 5031-5090.7 MHz frequency range and is used to transmit data, azimuth, and elevation as specified by the ICAO. Coordination is required with the applicable FAA Service Area as they engineer the frequency support for MMLS systems. This system is highly transportable as it is deployed to off-base landing sites.

6.6.4. Tactical Air Navigation (TACAN). The TACAN provides short-distance range and azimuth information to the aircraft. The TACAN system consists of an airborne interrogator operating in the 1025-1150 MHz band and a ground transponder operating in the 962-1024 MHz or 1151-1213 MHz band. In some cases the transponder is on an airborne platform. This configuration is referred to as air-to-air TACAN. This configuration is used, for example, during air refueling. The band 962-1024 MHz is referred to as low band and 1151-1213 MHz is referred to as high band. This is important when supporting tactical equipment because many systems have a low band antenna and a high band antenna; therefore, know which is in use in order to request frequency supportability. When making assignments normally only the ground transmit frequency (SFAF Item 110) is assigned and its paired airborne frequency is assumed. TACANs are classified into three categories depending on their operational use: terminal

facility, local enroute facility, or high enroute facility. The classification of the facility is important because it determines the level of protection afforded the facility. The standard service volume (SSV) (SFAF Item 503) is required on all assignments.

6.6.4.1. Standard Service Volume (SSV). Ground stations are classified according to their intended use. These stations are available for use within their service volume. Outside the service volume, reliable service may not be available. For standard use, the airspace boundaries are called SSVs. They are defined in Table 6.1. for the three station classes.

Table 6.1. SSV.

SSV Class Designator	Altitude and Range Boundaries
T (Terminal)	From 1000 feet (305 m) above ground level (AGL) up to and including 12,000 feet (3,658 m) AGL at radial distances out to 25 nmi (46 km).
L (Low Altitude)	From 1000 feet (305 m) AGL up to and including 18,000 feet (5,486 m) AGL at radial distances out to 40 nmi (74 km).
H (High Altitude)	From 1000 feet (305 m) AGL up to and including 14,500 feet (4,420 m) AGL at radial distances out to 40 nmi (74 km). From 14,500 feet (4,420 m) AGL up to and including 60,000 feet (18,299 m) at radial distances out to 100 nmi (185 km). From 18,000 feet (5,486) AGL up to and including 45,000 feet (13,716 m) at radial distances out to 130 nmi (241 km).

6.6.4.2. TACAN Channels. Airborne and ground TACAN frequencies are paired to form 126 "X" channels and 126 "Y" channels as shown in the NTIA Manual. In the "X" configuration, the ground reply frequency is 63 MHz less than the airborne frequency for channels 1-63 (low band) and 63 MHz higher for channels 64-126 (high band). In the "Y" configuration, the ground reply frequency is 63 MHz higher than the airborne frequency for channels 1-63 and 63 MHz lower than the airborne frequency for channels 64-126. The AF primarily uses "X" channels within the US&P, except for certain air-to-air TACAN operations.

6.6.4.2.1. TACAN channels 1-16 and 60-69 are reserved for military tactical and training operations, while the remaining 100 "X" channels are used by the NAS.

6.6.4.3. Air-to-Air TACAN Channels. The following applies to AF units that need to use TACAN channels for air-to-air operations:

6.6.4.3.1. TACAN frequency assignments are normally for a 10-year period, with renewal, after coordination with the FAA.

6.6.4.3.1.1. **(Added-USAFE)** TACAN frequency assignments are granted by HNs with variable time frames. Spectrum Managers will be cognizant of review date posted in SFAF. All renews will be approved by the HNs.

6.6.4.3.2. TACAN operations using the azimuth mode are authorized only within areas bounded by specific geographical coordinates. Send frequency proposals in

SFAF to AFSMO through the appropriate MAJCOM. Include in SFAF Item 531 the geographical coordinates that enclose the desired area of operation. If several states are involved, insert "USP" in Items 300 and 400 and list all states in SFAF Item 530. Coordinate with all FAA Service Areas involved. Ask for "Y" channels if technically possible. State the number of channels needed and justify their use in SFAF Item 520.

6.6.4.3.2.1. **(Added-USAFE)** Air-to-air TACAN operations are authorized on area-wide basis within a country. If the intended use expands past a country's border, a SFAF will be submitted for each country involved. Indicate in SFAF Item 502 of total intended locations for each SFAF.

6.6.5. Distance Measuring Equipment (DME). DME operates on frequencies in the UHF spectrum between 962-1213 MHz in a LOS principle and furnishes distance information with a high degree of accuracy. In the operation of DME, paired pulses at a specific spacing are sent out from the aircraft (this being the interrogation) and are received at the ground station. The ground station (transponder) then transmits paired pulses back to the aircraft at the same pulse spacing but on a different frequency. The time required for the round trip of this signal exchange is measured in the airborne DME unit and is translated into distance (nmi) from the aircraft to the ground station.

6.6.5.1. Air-to-air DME operations are authorized on an area-wide basis (e.g., state or states, US, or US&P). Submit frequency proposals for DME operations in SFAF through command channels to AFSMO. Give the number of channels needed, the maximum number of aircraft involved in the operation and justification for use of the civil channels. Apply for "Y" channels if technically possible. Include in SFAF Item 520 the statement, "Required for DME operations only; will not use the azimuth mode."

6.6.5.2. **(Added-USAFE)** Air-to-air DME operations are authorized on area-wide basis within a country. If the intended use expands past a countries border, a SFAF will be submitted for each country involved. Indicate in SFAF Item 502 of total intended locations for each SFAF.

6.6.6. VOR. VOR facilities provide bearing information to aircraft and operate in the 108-117.95 MHz band as shown in the NTIA Manual. Most VORs use voice and Morse code transmissions to identify the ground facility.

6.6.7. VOR Tactical Air Navigation (VORTAC). The VORTAC is a facility consisting of a collocated VOR and TACAN. The VORTAC is the most common unified aid within the AF. Both facilities are located in the same place, transmit simultaneously on a paired channel and share the same three-letter identifier. If the facilities do not meet the following antenna separation criteria, they are not considered a single NAVAID and must use unpaired channels and different identifiers. Only the FAA may waive these requirements.

6.6.7.1. For stations used in terminal areas for approach procedures, the separation for a standard VOR antenna and the associated DME or TACAN antenna will not exceed 100 feet. For a Doppler VOR antenna and associated DME or TACAN antenna, separation will not exceed 260 feet.

6.6.7.2. VOR and DME or TACAN antenna separation will not exceed 2,000 feet for facilities providing only enroute services. Refer to the NTIA Manual for complete table.

6.6.8. ATC Radar Beacon (ATCBS) System Identification Friend or Foe (IFF) and Selective Identification Feature (SIF). The IFF/SIF consists of a ground interrogator that operates on 1030 MHz and an airborne transponder that replies to the interrogations on 1090 MHz. Frequency assignments are only processed for the ground interrogator. The airborne reply is assumed and no assignment is required. The IFF/SIF is normally paired with the airport surveillance radar (ASR). If the IFF/SIF is paired with an ASR, SFAF Item 506 must cross reference the ASR. For example: P/W AN/TPX-42, PRR250.

6.6.8.1. The transmitter power of beacon interrogators used with terminal surveillance radars is normally 300 watts.

6.6.8.2. IFF/SIF ramp tester units will use a PRR of 230 pulses per second (PPS), triggered for stability and limited to 4 watts of transmitter power to the antenna.

6.6.8.3. PRRs for IFF/SIF may be the same as, or submultiples of the ASR PRR. Also, if the ASR operates with a staggered PRR, the IFF/SIF may also operate with a staggered PRR, normally below 400 PRR.

6.7. Radar. Radar systems operate in various portions of the spectrum.

6.7.1. Aeronautical Radio Navigation Radar. Only ground-based radars performing an ATC function may use these frequency bands. Use includes associated airborne transponders activated by radars operating in the same band. Coordinate with the applicable FAA Service Area before sending frequency proposals. Radar equipment performing a function other than listed below will not normally have frequency assignments in these bands.

6.7.1.1. Long-Range Radar (LRR). The 1240-1370 MHz band is used for LRR.

6.7.1.2. Air Surveillance Radar (ASR). ASRs operate in the 2700-2900 MHz band. The FAA controls the frequencies and PRR. In certain areas of the US it is difficult to accommodate new radars in the 2700-2900 MHz band. Radar systems complying with Criteria D of the Radar Spectrum Engineering Criteria (RSEC), under the NTIA Manual, shall incorporate additional EMC features when intended for use in designated heavily used areas, or for collocated operations with other radars. The applicable FAA Service Area and the agency asking for the assignment assess the need for these additional EMC features when coordinating a frequency assignment in the 2700-2900 MHz band. Frequency assignments for those radars with the additional EMC features installed will contain record note S373.

6.7.1.3. Precision Approach Radar (PAR). PARs operate in the 9000-9200 MHz band.

6.7.2. Aircraft Control and Warning (AC&W). The military AC&W radars operate in the 2900-3100 MHz band. The FAA does not control this frequency band; however, since the AC&W radar is normally paired with an IFF/SIF, the FAA will need to know the PRR of the AC&W radar so they can properly coordinate on the PRR for the IFF/SIF.

6.8. Radar Speed Guns. Police radar speed guns operate on either 10525 or 24150 MHz. Frequency assignments are required.

6.9. Commercial Satellite Use. All satellite terminals capable of accessing commercial satellites in the Fixed Satellite Service (FSS) must comply with the CFR Title 47 U.S.C., Part 25, *Satellite Communications*. Submit proof of Part 25 compliance as part of the DD Form 1494 or EL CID file package through frequency management channels to AFSMO. Request required frequency assignments once the NTIA and the FCC have granted support.

6.10. Spacecraft and Balloon Systems. Spacecraft and balloon systems developed or operated by the AF must be capable of on and off control of emissions by telecommand.

6.11. Electronic Fuses. Installation commanders set local coordination procedures for installation and tenant activities that develop, design, or use electronic fuses. Electronic fuses that activate detonation devices do not require a DD Form 1494 or an EL CID file. Units that develop, design, or use electronic fuses must:

6.11.1. Research, determine, and evaluate existing frequency assignments for compatibility with the intended RF environment.

6.11.2. Contact the applicable spectrum managers (MAJCOM or DoD AFC) to select fuse frequencies.

6.11.3. Limit fuse-triggering transmitter emissions to the narrowest bandwidth possible.

6.11.4. Reduce the level of unnecessary emissions.

6.11.5. Use equipment tunable on more than one frequency.

6.11.6. Provide protection from accidental triggering by other RF emissions through coding, improving receiver selectivity, shielding components, or other techniques.

6.12. Weather Radars. Weather radars normally operate in the 2700-2900 and 5350-5650 MHz bands. Spot frequency assignments are required.

6.12.1. Weather radars that use conventional magnetron output tubes have inherent spurious emission levels that may cause RF interference to digital radio-relay microwave systems. Existing radars in the category include the WSR-57, WSR-74S, WSR-74C, AN/FPQ-21, and the AN/FPS-77. Users must install RF waveguide filters that reduce the spurious emission levels by at least 40 dB before using these radars at a new location.

6.13. Telemetry Frequencies. The following bands are allocated for telemetry operations of aeronautical vehicles, upper atmosphere research devices, guided missiles, space system boosters, and space vehicles subject to compliance with NTIA 4.3.4, *Telemetry Frequency Plan and Standards*, cited in Section 5.3.7 of the NTIA Manual.

6.13.1. The 1435-1535 MHz and 2360-2390 MHz bands. These frequencies are designated for telemetry and associated telecommand during flight-testing of manned and unmanned aircraft, missiles, or their major components. Coordinate all operations in these bands with the AFTRCC and the applicable AFC. The NTIA Manual provides detailed AFTRCC procedures. Refer to Chapter 5 of the manual for the AFTRCC coordination agencies.

6.13.1.1. Assignments in both bands are centered on frequencies at standard intervals of 1 MHz, beginning at 1435.5 and 2310.5 MHz respectively, and are allowed bandwidths of 1, 3, or 5 MHz. Assignments with bandwidths greater than 1 MHz are

centered so they do not extend outside the allocated bands. Emissions with bandwidths greater than 5 MHz may be approved by NTIA on a case-by-case basis.

6.13.1.2. The 1435-1525 MHz band consists of ninety-nine (99) 1-MHz channels designated for telemetry.

6.13.1.2.1. Frequencies 1444.5, 1453.5, 1501.5, 1515.5, 1524.5, and 1525.5 MHz are shared with flight telemetry mobile stations. Use limited to 1 MHz bandwidth except for frequencies 1524.5 and 1525.5 MHz where a bandwidth of 2 MHz is permitted.

6.13.1.3. The 2310-2390 MHz band consists of seventy-three (73) 1-MHz channels designated for telemetry.

6.13.1.3.1. Frequencies 2312.5, 2332.5, 2352.5, 2364.5, 2370.5, and 2382.5 are shared on a coequal basis with operations of expendable and reusable launch vehicles. Such use is limited to 1 MHz bandwidth.

6.13.1.4. Telemetry associated with launching and reentry into the earth's atmosphere, as well as incidental orbiting before reentry of occupied objects undergoing flight tests, is also allowed within these bands.

6.13.1.5. Telecommand stations authorized to operate in these bands must directly support telemetry functions. Assignments are limited to 1 MHz bandwidth and must use antennas having a half-power beamwidth of no more than 8 degrees and a front-to-back ratio of at least 20 dB.

6.13.1.6. Channels designated for aeronautical telemetry in the 1435-1525 MHz band are also available for space telemetry on a shared basis.

6.13.1.7. The 1530-1535 MHz band is allocated primarily to Maritime Mobile (MM) satellite services (MSS); mobile aeronautical telemetry is secondary.

6.13.2. The 2025-2100 MHz and 2200-2290 MHz bands. These frequencies are designated for telemetry and associated telecommand for launch vehicles, missiles, and upper atmosphere research rockets, in addition to space missions (of extended duration). Such use is on a coequal shared basis with fixed and mobile LOS operations. All (space-related) operations in these bands must be coordinated with DoD and National Aeronautics and Space Administration (NASA).

6.13.2.1. The 2200-2290 MHz band consists of ninety (90) 1-MHz narrowband channels beginning at 2200.5 MHz in 1-MHz increments through 2289.5 MHz.

6.13.2.2. Emission bandwidths greater than 1 MHz are permitted, provided the assigned frequencies are centered on the center frequencies of narrowband channels and do not extend outside the allocated band.

6.13.2.3. No provision is made in the 2200-2290 MHz band for flight-testing of piloted aircraft.

6.14. International Distress and Emergency Frequencies. The U.S. Government and DoD have adopted the international distress and emergency frequencies shown in Table 6.2. Frequency assignments are not required.

Table 6.2. Emergency Frequencies.

SERVICE	FREQUENCY (EMISSION)	COMMUNICATION SERVICE	FUNCTION
International Distress and Emergency	500 kHz	Aeronautical, Maritime, Survival Craft	Distress (Telegraphy)
	2182 kHz	Aeronautical, MM, Survival Craft	Distress
	3023 kHz	Mobile	Search and Rescue (SAR)
	5680 kHz	Mobile	SAR Operations
	8364 kHz	Aeronautical, MM	SAR
	40.5 MHz	Mobile	Military Joint Common (US&P only)
	121.5 MHz	Aeronautical	Emergency and Safety
	123.1 MHz	Aeronautical, Mobile	SAR, Scene of Action
	156.3	Aeronautical, MM	SAR Operations
	156.8 MHz	MM	Call, Reply and Safety
	243.0 MHz	Military Aeronautical	Emergency and Survival
	406-406.1 MHz	Mobile-Satellite	Emergency Position-Indicating Radiobeacon
Radio Amateur Civil Emergency Service (RACES)	3997 kHz (6K00A3E)	RACES Stations	Civil Emergency
	3998.5 kHz (3K00H3E)		
	53.3 MHz (36K00F3E)		

6.14.1. Any mobile station experiencing an emergency may use the frequencies listed in Table 6.2. If a mobile station in distress is unable to make contact on emergency frequencies, it may use any available means to obtain help. Policies for using these frequencies are:

6.14.1.1. Send distress calls or messages only on the authority of the person responsible for the ship, aircraft, or other vehicle carrying the mobile station.

6.14.1.2. The frequencies are used only for actual emergencies, not for simulated emergency training.

6.14.1.3. Do not radiate when testing an emergency frequency during experimental, production, or maintenance operations.

6.14.1.4. Do not make operational checks to ensure proper system operation (confidence checks) more than once in any 24-hour period and keep them as short as possible.

6.14.1.5. Activities completing a communications contact on equipment used for emergency purposes will consider the contact the confidence check for that period.

6.14.1.6. Only make confidence checks with stations authorized to operate on the particular emergency frequency. Do not transmit "in the blind" for confidence checks.

6.14.2. **(Added-USAFE)** Refer to ACP 190 NATO SUPP-1 (B) for complete list and usage rules.

6.15. Radio Amateur Civil Emergency Services (RACES). AF activities may use the RACES station frequencies listed in Table 6.3. to make initial contact with RACES personnel to coordinate on emergency or disaster related matters. Additional information can be found in the NTIA Manual.

6.15.1. **(Added-USAFE)** The use of amateur frequencies must be approved by the HN for approval under normal conditions.

6.16. Standard Frequency and Time Broadcasts. Frequencies are nationally and internationally allocated and assigned for specific stations to broadcast time and frequency signals. The following are key points about the national standard broadcasts:

6.16.1. US Standard Broadcasts. The National Institute of Standards and Technology of the DoC operates three radio stations providing highly accurate frequency and time signals:

6.16.1.1. WWV near Fort Collins CO broadcasts on frequencies 2.5, 5, 10, 15, and 20 MHz.

6.16.1.2. WWVB, also near Fort Collins CO broadcasts on frequency 60 kHz.

6.16.1.3. WWVH, on the island on Kauai HI broadcasts on frequencies 2.5, 5, 10, and 15 MHz.

6.16.1.4. These stations provide government and private agencies precise time and accurate frequency signals for setting chronometers and calibrating frequency-sensitive equipment.

6.17. DoD Use of Frequencies in Non-Federal Government Bands. The military may use some frequencies allocated for non-federal government use on a secondary, NIB as outlined below. These frequencies may be used to meet peacetime tactical and training requirements as well as military test range operations. The frequencies are used only when government bands will not satisfy frequency needs and when use does not cause interference to non-federal government users. The military must accept any interference caused by non-federal government authorized users. Military use of a frequency will not bar new non-federal government assignments on that or adjacent frequencies.

6.17.1. The 4-27 MHz MM and Broadcasts Bands. AF activities may use frequencies allocated to the Maritime Mobile service and broadcast services for peacetime military tactical and training purposes within the US&P. Refer to the NTIA Manual.

6.17.1.1. MAJCOM SMOs are delegated assignment authority in these bands to exclude use of long haul communications. No assignment in either the GMF or the FRRS is required.

6.17.1.2. MAJCOMs will implement procedures to track assignments within their respective command to include unit, location, and inclusive dates (not to exceed 1 year). Either spot frequency or band assignments are authorized.

6.17.1.3. MAJCOMs may not use this authority to circumvent standard frequency assignment procedures for fixed terrestrial systems or HF networks.

6.17.1.4. This authority is to support training and field operations around an installation or exercise area where the type of equipment used is either portable or transportable. Aeronautical mobile operations are strictly prohibited.

6.17.1.5. Users will limit transmitter power to the minimum necessary for reliable communications and will not exceed the power for specific types of emissions. Refer to the NTIA Manual for the allowable frequencies, emissions, and power levels in the 4-27 MHz band.

6.17.1.6. When notified by the FCC or other authority that AF transmissions are interfering with a MM or broadcast station, the identified station will immediately cease operation.

6.17.1.7. Users may receive interference on these bands and will not try to obtain relief from such interference; however, they can request a replacement frequency through command spectrum management channels.

6.17.1.8. AFSMO reserves assignment authority for those frequencies listed in Chapter 7 of the NTIA Manual for long haul HF operations. Request use of these frequencies through command channels.

6.17.2. Military use of non-federal government bands above 25 MHz.

6.17.2.1. The military services may use frequencies in the non-federal government bands above 25 MHz for tactical and training operations in the US&P as shown in the NTIA Manual. AF activities will coordinate use with their host MAJCOM SMO and the local FCC through the FCC Watch Officer.

6.17.2.2. Military use of these frequencies will not bar present or future assignments of non-federal government frequencies to non-military government agencies through normal IRAC and FCC coordination.

6.17.2.3. The military will protect specific non-federal government frequencies authorized for government agencies.

6.17.3. Military Test Range Operations. The FCC and the military services have arranged for the military use of non-federal government bands at the military test ranges shown in the NTIA Manual. The authorized frequency bands are listed in the NTIA Manual. The following procedures apply to use of these non-federal government bands:

6.17.3.1. Do not use these frequencies if government bands can satisfy the requirement.

6.17.3.2. Limit use to those intermittent operations that can be stopped immediately upon notification that they are causing harmful interference.

6.17.3.3. Select frequencies to avoid harmful interference to known non-federal government operations.

6.17.3.4. Where practical, the military station identifies itself using a call sign or periodic interruption according to a prearranged schedule.

6.17.3.5. Do not use non-federal government bands to develop military systems that may need a new frequency allocation.

6.18. Amateur Frequencies. The military services may not use amateur frequencies within the US&P during normal peacetime conditions, except as authorized by the NTIA or FCC.

6.19. Citizen Band (CB) Radio Service. AF CB stations must operate in accordance with FCC Rules and Regulations, Part 95, Subpart D (CFR Title 47 U.S.C., Part 95, *Personal Radio Services*). AFSMO maintains frequency assignments within this band authorized by the FCC for AF CB operations. Frequency proposals for CB frequency assignments are considered on a case-by-case basis based on justification and operational concept. Assignments will include record note S348 in SFAF Item 500 and results of national level coordination with the FCC.

6.19.1. Law enforcement agencies may communicate with the motoring public on and around an installation for the purpose of providing emergency assistance to the public. Use CB Channel 9 for this purpose.

6.19.2. Emergency vehicles using public highways for travel or guarding military convoys may communicate with the motoring public and civil authorities.

6.19.3. Convoys traveling on public highways may communicate with the motoring public and civil authorities.

6.19.4. Only US government personnel may operate the equipment.

6.19.5. Do not use CB radios to conduct military-related communications, or instead of obtaining a frequency assignment to operate on an appropriate military system.

6.19.6. Users will not submit frequency requests for CB assignments and will only grant authorization to users in accordance with the above rules.

6.19.7. **(Added-USAFE)** CB use is not authorized for use in Europe unless formally approved by the HN.

6.20. Broadcasting Service Frequencies. The military services are not authorized to operate any broadcast facility within the US&P, except in select circumstances. Exceptions are Travelers Information System Amplitude Modulation (AM) broadcast stations that are licensed through the FCC. These stations are non-commercial and are generally restricted to bulletin board-type information such as available installation facilities, travel restrictions, and driving hazards. Submit requirements for broadcast facilities through command channels to AFSMO for FCC coordination.

6.21. Cellular Telephone Systems. These systems operate on non-federal government frequencies. National regulations do not permit assignment of these frequencies to government agencies (including DoD). AF activities requiring cellular service must contract through a local carrier. Frequency authorization for cellular service is a FCC and local carrier function, and federal frequency assignments are not required.

6.21.1. Frequency assignments are not required for cellular service leased according to AFI 33-111, *Voice Systems Management*.

6.22. Pager Systems. The 138-144 MHz band is used for AF pager systems, unless another band is required for operational reasons. AF activities will study shared use of existing paging systems in the area before asking for a frequency assignment and obligating funds for equipment. Ensure a pager frequency authorization is available before deploying pager equipment overseas.

6.23. Maritime Mobile (MM) Frequencies. The 156-162 MHz band is allocated primarily for non-federal government MM communications.

6.23.1. The channels in the MM band are reserved for communications between vessels and designated commercial marine operators and for non-federal government ship-to-shore and inter-ship operations.

6.23.2. Government stations may request the use of specific channels on a case-by-case basis if they have a valid need to communicate with the affected non-federal government licensees. AF activities will submit requirements through command channels to AFSMO.

6.23.2.1. When using MM frequencies, regulations in the NTIA Manual must be adhered to. Channel 6, 156.3 MHz, may be authorized for inter-ship communications. This channel is authorized for coordinated operation at the scene of a SAR incident (refer to the NTIA Manual). Coast stations may use this channel during emergencies affecting life or property when other means of communications are not practical. Channel 22, 157.1 MHz, is the primary frequency for liaison communications between ship stations and the US Coast Guard stations. AF activities will submit requirements through command channels to AFSMO. Channels 81A and 82A are allocated for "US Government Only" and can be requested to support AF operations.

6.24. AF Experimental Radio Stations. AF experimental radio stations are listed in the NTIA Manual and are authorized to use any RF except those bands listed in the NTIA Manual for short or intermittent periods without prior authorization of specific frequencies for short or intermittent periods under the following conditions:

6.24.1. Operations are confined to the immediate vicinity of the station.

6.24.2. The nature or duration of the requirement makes assignment of specific frequencies impractical.

6.24.3. All reasonable measures are taken before such frequencies are used to ensure that harmful interference will not be caused to authorized services. Otherwise, operations must terminate.

6.24.4. This authority is limited to RF usage, which is an integral part of an experimental operation and shall not be construed as authorizing frequency usage for administrative or operational use.

6.24.5. Experimental operations conducted pursuant to this authority shall be terminated immediately upon receipt of notice of harmful interference being caused to an authorized service.

6.25. Industrial, Scientific, and Medical Equipment. Industrial, scientific, and medical (ISM) equipment is defined as the operation of equipment or appliances designed to generate and use RF energy for ISM, domestic or similar purposes, excluding application in the field of telecommunications. Assignments are not required to operate ISM equipment within the US&P under the following conditions:

6.25.1. Operate on the designated Industrial, Scientific, and Medical Equipment equipment frequencies (see Para. 7.10.1 of the NTIA Manual).

6.25.2. Terminate use of Industrial, Scientific, and Medical Equipment equipment, or take steps to resolve interference, when interference to authorized frequency users occurs outside the ISM equipment frequency limits.

6.25.3. Industrial, Scientific, and Medical Equipment equipment operations are prohibited on the following SAR frequency bands: 490-510 kHz, 2170-2194 kHz, 8354-8374 kHz, 121.4-121.6 MHz, 156.7-156.9 MHz, and 242.8-243.2 MHz.

6.25.4. Industrial, Scientific, and Medical Equipment equipment must meet conditions in the NTIA Manual.

6.25.5. **(Added-USAFE)** In Germany, Austria, Bosnia and Herzegovina, Croatia, The Former Yugoslav Republic of Macedonia, Liechtenstein, Montenegro, Portugal, Serbia, Slovenia and Switzerland, the band 433.05-434.79 MHz (center frequency 433.92 MHz) is designated for industrial, scientific and medical applications. Radio communication services of these countries operating within this band must accept harmful interference which may be caused by these applications.

6.26. Family Radio Service (FRS). FRS is a FCC unlicensed low powered service that provides coverage up to 2 miles using frequencies within the FRS frequency pool (see Table 6.3.). FRS radio may be used on any of the 14 FRS channels, which are shared between all FRS users. Thirty eight privacy codes allow the FRS users to limit the transmissions received to those users on the same channel and privacy code. This reduces confusion between multiple conversations on the same channel. A reminder that any FRS user can listen to any ongoing conversation and can legally break into that conversation. No FCC license or permanent frequency assignment is required and no FRS channel may be assigned to any specific individual or organization.

Table 6.3. FRS Frequency Pool.

FRS Frequency Pool (MHz)			
462.5625	462.5875	462.6125	462.6375
462.6625	462.6875	462.7125	467.5625
467.5875	467.6125	467.6375	467.6625
467.6875	467.7125		

6.26.1. AF entities are authorized to purchase and operate FRS radios pursuant to Part 95, Subpart B of the FCC Rules and Regulations (CFR Title 47 U.S.C.). AF users will be accorded the same privileges as non-federal users. FRS users must share each channel and no user is assured protection from interference caused by another authorized user. User assumes those limitations when this equipment is purchased and operated. AF entities may not purchase and operate FRS radios for planned communications operations

that safeguard human life or property and should not be used for military missions. No license or frequency assignment is required or can be obtained in the US&P. AF FRS users must comply with the following conditions:

6.26.1.1. Comply with CFR Title 47 U.S.C., Part 95, Subpart 95.191, *Eligibility and Responsibility*; Subpart 95.192, *Authorized Locations*; Subpart 95.193, *Types of Communications*; Subpart 95.194, *FRS Units*.

6.26.1.2. Use of FRS devices outside the US&P is subject to host country and international regulations. AF members or employees are not authorized to use FRS radios outside the US&P without HN approval. Unified command directives apply. Coordinate FRS use with the appropriate AF component SMO.

6.26.1.3. AF members and employee users are responsible for all communications using FRS radio equipment. Use must comply with federal, state, and local law.

6.26.1.4. The installation commander may prohibit FRS when interference to mission essential EM equipment is anticipated or to resolve a suspected RFI problem.

6.26.1.5. AF members and employees using FRS radios must relinquish channel use for emergency communication messages concerning the immediate safety of life or the immediate protection of property.

6.26.1.6. Use only FCC certified FRS. Any modification to the equipment to boost power, add a different antenna, or to increase the gain of the current antenna, cancels the FCC certification and voids authority. Illegal FRS equipment is subject to confiscation.

6.26.1.6.1. **(Added-USAFE)** Use only CE certified FRS equipment. Any modification to the equipment to boost power, add a different antenna, or to increase the gain of the current antenna may cancel the CE certification, void the authority for its use, and violate US-host nation agreements and/or host nation laws. Illegal FRS equipment is subject to confiscation.

6.26.1.7. FRS devices are not authorized for classified, sensitive but unclassified, command and control, squadron operational, aircraft/flight line maintenance, fire crash, explosive ordinance disposal, security forces, emergency/disaster response, tactical or training operations, and/or medical communications.

6.26.1.8. Under no circumstance will FRS radios be permitted for use in controlled areas without express written consent of the installation commander and full compliance with all security directives.

6.26.1.9. Use of FRS cannot be protected from harmful interference. FRS radios may not cause interference to any licensed device and must accept all interference from licensed devices.

6.26.1.10. The FCC may restrict use of the FRS radios if the station is located within the National Radio Quiet Zone (areas of MD, VA, and WV bounded by 39°15’N 78°30’W, 39°15’N 80°30’W, 37°30’N 78°30’W, 37°30’N 80°30’W).

6.26.1.11. AF members and employees assigned to non-appropriated fund activities and some appropriated fund activities may use FRS radios, as follows: to

communicate with non-government users during AF supported or sponsored community activities, i.e., scouts, Special Olympics, youth activities/sporting events, civil disasters, funeral details for deceased military veterans, etc. In addition, FRS radios may be used for administrative purposes when communicating in warehouses, commissaries, base exchanges, billeting areas, work crews, etc. FRS radios may also be used on AF installations where the public is permitted entrance and in family housing areas.

6.26.1.11.1. **(Added-USAFE)** Air Force members and employees who belong to non-appropriated fund activities and some appropriated fund activities may use CE certified FRS radios, as follows: To communicate with non-government users during Air Force supported or sponsored community activities, i.e., scouts, Special Olympics, youth activities and sporting events, civil disasters, funeral details for deceased military veterans, etc. In addition, CE certified FRS radios may be used for administrative purposes when communicating in warehouses, commissaries, base exchanges, billeting areas, work crews, etc. CE certified FRS radios may also be used on Air Force installations where the public is permitted entrance and in family housing areas.

6.27. Inter-Squad Radio (ISR). The ISR is the military FRS radio operating in the 380-399.975 MHz sub-band and is recommended over the commercial FRS for AF members and employees. Because it is in the government frequency band and the potential for EMI is less, it can be used for tactical or training operations unlike the FRS that uses civil spectrum. Other operations permitted with the ISR are cantonment areas and roving/walking guard posts. Unless appropriately encrypted, ISRs cannot be used to transmit classified, sensitive, command and control, fire/crash, security, and/or emergency response/medical communications. Refer to AFI 33-201, *Communications Security*, for guidance on protecting these types of communication.

6.27.1. Do not modify the ISR.

6.27.2. Only AF members, employees, and contractors providing support to military operations will use the ISR.

6.27.3. IRS will not be used for personal business.

6.27.4. Possession and use of ISR devices outside the US&P is subject to host country and international regulations. AF members, employees, or contractors are not authorized to use ISR devices outside the US&P without HN approval. COCOM directives apply. Coordinate ISR use with the appropriate AF component SMO. Additional restrictions may be imposed in different AORs (i.e., Tactical and Training LMRs require National Security Agency type 1 encryption).

6.28. General Mobile Radio Service (GMRS). The GMRS is an FCC licensed personal two-way voice communications service used to facilitate the activities of an individual and their immediate family providing coverage up to 5 miles. GMRS cannot be used by government agencies under any circumstances. CFR Title 47 U.S.C., Part 95 provides regulatory guidance.

6.29. Multi-Use Radio Service (MURS). The FCC established MURS in 2002 as a Citizens Band Radio Service. This equipment cannot be used by government employees in the line of duty, or as an employee of any government entity, including non-appropriated fund activities.

6.30. Terrestrial and Space Systems within Shared Bands. The following information applies to those bands between 1 GHz and 50 GHz equally shared by space and terrestrial services:

6.30.1. AFSMO determines whether a proposed fixed or mobile station in these bands will be within the normal coordination distance of an earth station listed in the NTIA Manual.

6.30.2. If the location is within the coordination distance, AFSMO coordinates the request with the agency operating the earth station.

6.30.3. Begin coordinating earth stations during the system review using procedures outlined in the NTIA Manual. Indicate on applications for frequency assignments the status of coordination with agencies that have terrestrial operations in the same band and within the coordination area of the earth stations.

6.30.4. AFSMO does not take final assignment action until national-level coordination is complete.

6.31. Space and Balloon Systems. Include with each frequency request to radiate EM energy from spacecraft or balloon systems, either a detailed description of the methods for on-off telecommand capability, or a justified request for an exception.

6.32. Space-Ground Link Subsystem (SGLS) and Unified S-Band (USB). Satellite operations for military satellites are authorized for SGLS uplinks in the band 1761-1842 MHz and USB uplinks in the band 2025-2110 MHz and SGLS and USB downlinks in the band 2200-2290 MHz. Spectrum managers at Space and Missile Systems Center (SMC) located at Los Angeles AFB CA; Eastern Space and Missile Center (ESMC) located at Patrick AFB FL; and Western Space and Missile Center (WSMC) located at Vandenberg AFB CA manage and issue discrete frequency assignments on a program-by-program basis for all operations in these bands and coordinate with Federal Satellite Operations (per DoD/NASA MOU, 23 October 2003) and also the Electronic News Gatherers for uplink operation in the 2025-2110 MHz band. ***NOTE***: Dual-Band satellite operations policy requires shared AF, NASA, and National Oceanic & Atmospheric Administration (NOAA) operation in the 2025-2110 and 2200-2290 MHz bands.

6.33. Antenna Testing Frequencies Above 30 MHz. Include the following information in SFAF Item 520:

6.33.1. Effective radiated power. If unknown, give a reasonable estimate.

6.33.2. Profile of the surrounding terrain by description or other means. If testing within shielded enclosures, so state and give the attenuation (in dB) provided by the enclosure.

6.33.3. Antenna configuration, to include:

6.33.3.1. Whether full scale or less than full scale.

6.33.3.2. The estimated hours of use in local time (e.g., 0800 to 1700 daily, Monday through Friday; daytime only, Monday through Friday).

6.34. Requests for Restricted Frequencies. Except in unusual circumstances, do not ask for bands where regulations prohibit assignments (e.g., radio astronomy bands, standard frequency bands, some space bands, etc.). If a frequency is needed in a prohibited band, fully explain in SFAF Item 520 why operation is necessary in the prohibited band. Include type of service for which the antenna test is intended, (e.g., radiolocation, radionavigation, fixed, space). Give the government agency and contract number if testing supports a government contract. Explain the mission impact if you are not provided an assignment.

6.35. Line-Of-Sight Frequency Diversity. Justify the use of frequency diversity for new LOS transmission systems in 1755-1850, 2200-2290, 4400-4990, 7125-7250, 7300-7975, and 8025-8400 MHz bands. Explain the need for such a high degree of systems reliability and cite the engineering study showing that frequency diversity is necessitated by the required reliability. Existing systems using frequency diversity may continue until frequency congestion requires reevaluation.

6.36. Operating FCC-Licensed Stations on AF Installations.

6.36.1. CBs, amateurs, taxi companies, and other FCC licensed radio stations may transmit on AF installations but are subject to limitations imposed by the installation commander. Limitations should not unnecessarily infringe on the rights of the individual to operate a radio according to FCC Rules and Regulations (CFR Title 47 U.S.C., Part 73, *Radio Broadcast Services*).

6.36.2. Based on need, commanders may require registration of FCC-licensed station operating on an AF installation. Registration instructions should be included within installation introduction materials.

6.36.3. If FCC licensed stations are involved in interference:

6.36.3.1. Report interference from a FCC licensed station to AF operations according to AFI 10-707. The installation commander may direct an on-installation offending station to cease operations and will notify AFSMO, through host MAJCOM, of details of the action within 3 duty days. AFSMO will give this information, including action taken, to the FCC, Washington DC if appropriate, and the local FCC through the FCC Watch Officer.

6.36.3.2. Licensees report interference between two FCC licensed stations to the FCC Watch Officer.

6.36.3.3. Report AF operations interference to FCC licensed stations according to AFI 10-707.

6.36.3.4. The FCC resolves interference by a FCC licensed station to the reception of commercial broadcast stations or the use of home entertainment units. Victims of such interference report the problem to the FCC Watch Officer.

6.37. Joint Tactical Information Distribution System (JTIDS)/Multifunctional Information Distribution System (MIDS). JTIDS is a communications, navigation, and identification component of the Link 16 system intended to exchange surveillance and command and control information among various airborne and ground platforms. It operates in the 960-1215 MHz band using advanced synchronous time division multiple access, spread spectrum technology, frequency hopping, and cryptographic security. JTIDS randomly hops on 51

center frequencies and also uses 1030 and 1090 MHz for identification. The system is jam resistant, providing joint interoperability, battlefield situational awareness, and information superiority through the exchange of tactical digital information link (TADIL) J and Link 16 messages among JTIDS and MIDS terminals. JTIDS is a joint program and the USAF is the lead service; MIDS is a joint/international program and the US Navy is the lead service.

6.37.1. Users will process frequency requirements for JTIDS through command channels to the AFSMO JTIDS action officer. All JTIDS frequency actions will be coordinated at the national level with the FAA, military services, and affected military operating area spectrum managers. Frequency requests follow the normal IRAC/FAS process and require a minimum of 60-90 business days to complete.

6.37.2. JTIDS/MIDS Terminals. JTIDS/MIDS terminals operate within the frequency band allocated worldwide for aeronautical radionavigation. The FAA controls use of this band in the US&P. The DoD must operate within the strict guidelines set by the FAA to ensure flight safety.

6.37.3. Frequency assignments and operations must be in strict adherence to Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 6232.01D, *LINK-16 Spectrum*, and the JTIDS/MIDS Spectrum Users Guide (JSUG).

6.37.4. Due to increased reliance on this portion of the spectrum, the DoD and the Department of Transportation (DoT) entered into a MOA to protect continued use of this vital spectrum. Details of the MOA are at Attachment 5.

6.37.4. **(USAFE)** Use of Joint Tactical Information Distribution System (JTIDS) or Multifunctional Information Distribution System (MIDS) (Link 16) equipment to include entry into new or existing networks, within the EUCOM and AFRICOM AOR is governed by each host nation's JTIDS/MIDS Frequency Clearance Agreement (FCA). National FCAs describe the spectrum management criteria that must be adhered to during JTIDS/MIDS operations. Although not all FCAs use the same criteria, most FCAs have common and generic restrictions that must be adhered to, namely: Timeslot Duty Factor (TSDF), proximity of JTIDS/MIDS platforms to aeronautical navigational aids, transmitter power levels, message packing levels and Interference Protection Features (IPF). Where established, national and North Atlantic Treaty Organization (NATO) Data Link Management Cells (DLMC) are responsible for coordinating JTIDS/MIDS operations and ensuring compliance with the national FCAs. A variety of procedural and active network management/monitoring methods are employed by the different DLMCs to ensure that violations do not occur. Every USAFE-AFAFRICA main operating base that uses Link 16 should have appointed wing, unit and tactical data link managers as specified in AFI 11-261, 15 Oct 2012. They should be knowledgeable and able to advise on coordination requirements in nations where JTIDS/MIDS operations are conducted. Visiting forces to USAFE-AFAFRICA that wish to operate JTIDS/MIDS need to ensure they understand and comply with FCA requirements. JTIDS/MIDS operation in countries with no established FCA will usually need to be coordinated via Spectrum Management channels.

6.38. Station Keeping Equipment (SKE) (AN/APN-169 & AN/APN-243). SKE provides transport aircraft (C-130, C-141, and C-17) the ability to fly safely in close formation in all weather. This is accomplished by presenting the aircrew with a situational display that

shows the relative position of the other formation members in reference to the lead aircraft and alerts the crew via audiovisual proximity warning when aircraft come too close to each other. The system transmits high-powered pulses on one of four frequencies (3350, 3390, 3470, 3510 MHz). When used with the zone maker (AN/TPN-027B), the system provides for precision guidance to the drop zone.

6.38.1. The AMC Tanker Airlift Control Center (TACC). SMO maintains four frequency assignments for SKE usage within the US&P. The TACC SMO deconflicts SKE usage to ensure safe passage of multiple formations and drop zones.

6.38.2. Station Keeping Equipment Follow-On (SKEFO) (AN/APN-243A) provides transport aircraft (C-17) the ability to fly safely in close formation in all weather. This is accomplished by presenting the aircrew with a situational display that shows the relative position of the other formation members in reference to the lead aircraft and alerts the crew via audiovisual proximity warning when aircraft come too close to each other. The system allows interoperation of up to 100 aircraft in 100nmi range, utilizing a low probability of detection spread spectrum waveform in the 3100-3600 MHz band. The frequency hop set is programmable based on HN authorizations. Multiple hop sets may be loaded in to the system depending on each nation's authorizations. The lead aircraft coordinates the manual switching of the hop sets at country borders. When used with the zone maker (AN/TPN-027B), the SKEFO system operates in high-powered pulsed mode on one of four fixed channels and the system provides for precision guidance to the drop zone.

6.39. Single Channel Ground and Airborne Radio System (SINCGARS). The AF acquires ground SINCGARS radios from the Army. This program encompasses the following program elements: Airborne SINCGARS Jam Resistant VHF radio (AN/ARC-222) and the Ground SINCGARS Jam Resistant VHF Communications. The increased usage of tactical Unmanned Aerial Vehicles (UAV) and other Airborne Communications Node platforms requires a thorough understanding of the request procedures as well as potential limiting factors when considering employing the SINCGARS radio in ground based and/or airborne-based operations, hopping or nonhopping mode. The guidance below applies to CONUS only.

6.39.1. Ground Based SINCGARS. The objective of ground SINCGARS is to obtain a jam-resistant VHF ground radio capability.

6.39.1.1. Hopping and Non-hopping Modes. Frequency assignments and coordination for use are subject to the spectrum resources available in the local area.

6.39.2. Airborne Based SINCGARS. The objective of Airborne SINCGARS is to achieve a jam-resistant VHF voice radio capability for AF aircraft.

6.39.2.1. Hopping mode:

6.39.2.1.1. 30-88 MHz - Below 1,000 feet elevation AGL, hopping operations are coordinated with the supporting AFC.

6.39.2.1.2. 30-50 MHz - Above 1,000 feet elevation AGL, all frequencies must be coordinated with the supporting AFC.

6.39.2.1.3. 50-54 MHz - Above 1,000 feet elevation AGL, any and all use of this radio amateur band must be coordinated through the supporting AFC.

6.39.2.1.4. 54-88 MHz - Above 1,000 feet elevation AGL, the SINCGARS hopping mode may be permitted at selected sites within CONUS. Use can potentially interfere with commercial television, operational use is based on a case-by-case noninterference basis. This requires national level coordination with the FCC through proper frequency management channels. Refer to NTIA Manual for sub-bands authorized for usage when training with ground-based SINCGARS.

6.40. Military Aircraft Collision Avoidance System (MILACAS). MILACAS is the current generation technology version and replacement of Traffic Alert and Collision Avoidance System (TCAS) and Enhanced Traffic Alert and Collision Avoidance System (ETCAS). The system has advanced surveillance functions to support improved overall performance. MILACAS-FR supports improved TCAS performance and extended range coverage, while MILACAS-FR supports formation rendezvous capability utilizing Mode "S" data link and ultimately replacing SKE on C-130 and C-17 platforms.

6.41. HAVE QUICK. The basic HAVE QUICK (HQ) radio is a single channel UHF radio system modified to include a slow frequency hopping capability to counter jamming threats encountered in the early 1980s. During the mid to late 1980s, HAVE QUICK II evolved as a minimal cost modification of the basic HAVE QUICK that provided additional anti-jam protection, improved frequency hopping algorithms, and expanded hopsets. With an anticipated increase in jamming threats in the late 1980s and in an effort to refine the system's capabilities, the development of HAVE QUICK IIA was initiated. HAVE QUICK IIA was designed to provide faster frequency hopping rates, additional hop set's capability resulting from narrower channel bandwidth, and support for the transmission of digital data. Per STANAG 4372, HAVE QUICK IIA was designated as SATURN, the Second-generation Anti-jam Tactical UHF Radio for NATO. Although the US supports STANAG, SATURN remains an unfunded requirement and is not presently part of our radio inventory. The AF uses many different types of equipment for HAVE QUICK operations. For example: (AN/ARC-164/171/204/210/215/225; AN/GRC-171B (V) 4/206(V) 3/240; AN/PRC-113; AN/TRC-176; AN/TSQ-198; AN/URC-98A/99A; AN/VRC-83 (V) 3). Frequencies for AF operations are set-aside in Annex C of the MCEB 225-399.9 MHz channeling plan for HAVE QUICK I and HAVE QUICK II operations. Additional information for HAVE QUICK requirements can be found in AFTTP(I) 3-2.49, *Multi-Service Tactics, Techniques, and Procedures for HAVE QUICK Radios.*

6.42. Commercial Satellite Communications. The use of commercial satellite services is becoming more and more prevalent within DoD. DoD policy and guidance are described in CJCSI 6250.01B, *Satellite Communications*.

6.42.1. Once the requirement is defined the type of radiocommunication service must be identified. These services are either FSS or Mobile-Satellite Service (MSS).

6.42.1. **(USAFE)** HAVE QUICK usage within the EUCOM AOR is defined in ACP-190 NATO Supp. 2. For HAVE QUICK usage within the AFRICOM AOR contact the USAFE-AFAFRICA SMO for coordination.

6.42.1.1. FSS uses fixed earth stations and one or more space stations to route radio signals between fixed locations. FSS provides users with a leased transponder from a commercial satellite provider.

6.42.1.1.1. Refer to USMCEB-M-008-03, *DoD Spectrum Procedures for the Use of Commercial Satellite Earth Terminals Outside United States and Possessions,* for procedures and guidance regarding DoD users of earth terminals utilizing commercial FSS outside of the US&P.

6.42.1.1.2. Users must contact DISA, through command channels, for guidance on leased FSS under the DISN Satellite Transmission Services – Global (DSTS-G) contract.

6.42.1.2. MSS provides for communications between mobile earth stations by means of one or more space stations. (A mobile earth station is an earth station operating while in motion on land, at sea or in the air, or when halted at an unspecified location.) MSS provides users a service at a monthly fee similar to telephone service.

6.42.1.2.1. Refer to Assistant Secretary of Defense/Command, Control, Communications and Intelligence (ASD[C3I]) (now ASD/Networks and Information Integration [NII]) Policy Letter, *DoD Policy Letter on Managing MSS.*

6.42.1.2.2. Since the DoD is considered as just another user, the service provider is responsible for all spectrum supportability issues, including HN coordination.

6.42.1.3. In some cases, the FSS and the MSS include satellite-to-satellite links, which also may be operated in the Inter-Satellite Service (ISS). Also, these services may include feeder links necessary for their operation.

6.42.2. All equipment used to access a commercial satellite must conform to FCC Rules and Regulations (CFR Title 47 U.S.C, Part 25). One of two situations must apply. Either the government owns and operates the terminal equipment, or the terminal equipment is leased.

6.42.2.1. If the equipment is leased or commercially owned, the commercial provider is responsible for securing FCC Part 25 certifications and the frequency assignments.

6.42.2.2. If the equipment is DoD owned, DoD must request FCC Part 25 certification in order to obtain spectrum certification. When processing the DD Form 1494 or EL CID file, the user must also submit the information in Table 6.4.

Table 6.4. FCC Part 25 Certification.

Operational Description	Include an operational description and any supporting information you feel the FCC may need to understand your use.
FCC Radio License	If the assignment was supported by a commercial license, include the owner of the license, locations authorized on the license, the call sign, and the file number.
Location of Earth Station	Include the site ID, city, state, coordinates, and site elevation (meters) for each earth station. ***NOTE:*** The site ID is a name used to identify a specific earth station. This name will be used any time the site ID is requested.
Points of Communications	Include the satellites you desire to use and their location. ***NOTE:*** If the requirement will be for any US domestic satellite, you may enter ALSAT (All US Domestic Satellites).

Destination Points for Communications Using Non-US Licensed Satellites	Include the satellite name and all destination points for any requirements using non-US satellites.
Earth Station Antenna Facilities	Include the site ID; antenna ID, quantity, manufacturer, model, antenna size (meters), and the antenna transmit/receive gain (____dB referred to an Isotropic Antenna [dBi] at ____GHz) for all earth station antennas. ***NOTE:*** As with the site ID, the antenna ID is also a name used to identify a particular antenna and will be used any time the antenna ID is requested.
Antenna Heights and Maximum Power Limits	Include the antenna ID, maximum antenna height AGL (meters), maximum antenna height above mean sea level (meters), building height AGL (meters), maximum antenna height above rooftop (meters), total input power at antenna flange (watts), and total Effective Isotropic Radiated Power (EIRP) for all carriers (dB referred to 1 Watt [dBw]) for all antennas.
Frequency Coordination Limits	Include the antenna ID, frequency limits (MHz), range of satellite arc eastern limit, range of satellite arc western limit, antenna elevation angle eastern limit, antenna elevation angle western limit, earth station azimuth angle eastern limit, earth station azimuth angle western limit, and maximum EIRP density toward the horizon (dBw/4kHz) for all antennas.
Particulars of Operation	Include the antenna ID, frequency bands (MHz), mode of operation (transmit/receive), antenna polarization (H, V, L, R), emission designator, maximum EIRP per carrier (dBw), maximum EIRP density per carrier (dBw/4kHz) and a description of the modulation for all antennas. ***NOTE:*** All frequency bands and all emission designators must be listed for each band.

6.42.2.3. The FCC requires the following information for federal government use of commercial satellite spectrum:

6.42.2.3.1. A letter of acceptance or agreement from the satellite service provider.

6.42.2.3.2. A letter from the commercial satellite regional coordinator (for the earth station location) that indicates the earth station operations are accepted.

6.42.2.3.3. Documentation that the earth station terminal complies with Part 25 of the FCC Rules and Regulations.

6.42.2.3.4. A letter of request from the federal agency for use of the commercial spectrum (it must include the information in Table 4.7.).

6.42.3. Use outside of the US&P is subject to restrictions set forth by HN governments. Equipment use must be coordinated through the appropriate spectrum management channels. Users must verify HN supportability for equipment use and satellite service before deploying overseas with the service.

6.43. Inmarsat. Inmarsat is a commercial satellite system, operating in the Mobile-Satellite Service using geosynchronous satellites. It is subject to international law and treaty and can only be used for peaceful purposes. Inmarsat uses a satellite link to interface with terrestrial telephone systems or other Inmarsat terminals. Neither spectrum certification nor frequency assignments are required; however, special procedures exist for the purchase and use of Inmarsat terminals. Users must contact HQ AFNIC/ECMV, through command channels, for guidance. Additional information may be obtained at **https://private.afca.af.mil/mss**/, Annex E of the NTIA Manual, or contact the various vendors of Inmarsat compatible terminal equipment.

6.43.1. Per the MSS web page, **https://private.afca.af.mil/mss**/, send the completed Inmarsat application to AFNIC/ECMV (ATTN: MSS LCM, 203 West Losey Street, Scott AFB IL 62225-5222) through command channels for coordination and processing with the COMSAT Corporation. Do not submit applications directly to AFSMO, COMSAT Corporation, NTIA, the DoC or the FCC.

6.43.2. Use outside of the US&P is subject to restrictions set forth by HN governments. Equipment use must be coordinated through the appropriate spectrum management channels. Users should contact the Inmarsat POC to negotiate HN approval coordination. Refer to AFI 33-134, *Mobile Satellite Services (MSS) Management*, for procedures regarding MSS resources.

6.44. Iridium®. Iridium is a commercially available, satellite-based, global wireless personal communications network designed to permit any type of narrow band wireless transmission. It operates in the Mobile-Satellite Service using a non-geosynchronous satellite constellation. Per Assistant Secretary of Defense (Networks and Information Integration) ASD (NII) policy, Iridium is approved for use as a commercial leased service without a waiver. Neither spectrum certification nor frequency assignments are required; however, special procedures exist for the purchase and use of Iridium service and equipment.

6.44.1. Users must contact AFNIC/ECWM and DISA, through command channels, for guidance. Additional information is located at **https://private.afca.af.mil/mss**/. Refer to AFI 33-134 for procedures regarding MSS resources. Refer to DISA Circular 310-130-1, *Submission of Telecommunications Service Requests*, for the provisioning procedure.

6.44.2. Use outside of the US&P is subject to restrictions set forth by HN governments. Equipment use must be coordinated through the appropriate spectrum management channels. Users should contact AFNIC/ECWM to determine whether the HN has authorized the use of Iridium. Contact the Iridium POC to negotiate HN approval coordination.

6.45. Frequency Requests in Canada or along the US/Canadian Border. The US and Canada have made arrangements to coordinate frequency requests for radio transmitters operating close to both countries. AFSMO obtains licenses using the data from frequency actions sent by the MAJCOMs. Include in SFAF Item 520 the approximate number of civilian and military personnel assigned to the radio station on a yearly basis that directly operate and maintain transmitter and receiver stations.

6.45.1. Permanent and Temporary Assignments. The US and Canada have made arrangements to coordinate frequency requests for radio transmitters operating in Canada

or near the US/Canadian border. All assignments required for longer than 90 days that conform to the arrangements will be coordinated by the IRAC with the Canadian Government according to the NTIA Manual.

6.45.1.1. Assignments for AF Radio Stations in Canadian Territory. The Canadian Government (in agreement with the US Government) licenses US military radio stations in Canada. The Canadian-US defense agreement must authorize each station; however, these radio stations do not need individual licenses.

6.45.1.1.1. The following procedures apply to US military activities within Canada:

6.45.1.1.2. A Canadian-US defense agreement must authorize each installation or activity.

6.45.1.1.3. US military radio stations that support a US activity need a Canadian license.

6.45.1.1.4. Multiple equipment installations, such as communications complex transmitter sites, are licensed as individual stations.

6.45.1.1.5. Airborne radio stations do not need a Canadian license for communications with a licensed ground station, but do require frequency coordination and approval from the Canadian Frequency Allocation Coordinating Subcommittee and the Joint Telecommunications Committee for airborne radio operations. AFSMO processes the coordination and clearance through the MCEB FP for AF airborne radio stations operating in Canada.

6.45.1.1.6. Licenses issued to parent fixed stations include associated vehicular radio stations.

6.45.1.2. STAs. All STAs for 90 days or less will be coordinated by AFSMO with National Defence Headquarters, Ottawa, Canada.

6.45.2. Amendments to Licenses. Review frequency assignments before 1 December of each year to determine if any changes are needed. If so, send a frequency modification through command channels to reach AFSMO before 1 January of each year. Include in SFAF Item 520 the reason for the change. AFSMO coordinates the changes with the National Defence Headquarters, Director General Information Management Technologies//Director Information Management Technologies, Products and Services 5 (NDHQ DGIMT OTTAWA//DIMTPS 5).

6.45.3. Renewal of Licenses. The National Defence Headquarters, Director General Information Management Technologies//Director Information Management Technologies, Products and Services 5 (NDHQ DGIMT OTTAWA//DIMTPS 5) automatically renews radio licenses not requiring amendments on 1 April of each year, without any action by the applicant.

6.46. Mutual Aid. When the equipment is owned by the civil agency and is given to the government agency for the purpose of mutual aid, a government frequency assignment does NOT require entry into the GMF. When the government entity owns fixed station equipment and the purpose of the frequency usage is "mutual aid," then the frequency assignment must be registered into the GMF. Government owned mobile or portable assets, unless used in a

fixed station mode that is specifically intended to provide "mutual aid" support under a licensed non-federal government fixed station operating environment, does not have to be registered into the GMF. During the registration process, the FCC performs coordination required in the NTIA Manual. In addition, a Letter of Agreement must be on file and have been signed by the non-federal government or government parties requesting the aid agreement.

6.47. Spectrum support for RF-Dependent Foreign Military or Direct Commercial Sales (FMS/DCS) . Before AF spectrum support can be provided, a determination must be made by the FMS officer and the program manager that AF spectrum support is required. This determination depends in part on how the sale is being processed.

6.47.1. Foreign Military Sales (FMS). With regard to FMS, if the US government owns the equipment and will transfer the equipment directly to a foreign government, but has never operated the equipment in the US&P and never intends to operate the equipment in the US&P, then no DD Form 1494 is required and the US government may apply for a temporary frequency assignment. The frequency proposal application will clearly state, using S-Note 303, that there is no intent to use the equipment in the US&P and a remark in SFAF Item 503 should state: "FMS." If the US government owns the equipment and has operated or intends to operate the equipment in the US&P, then the normal DD Form 1494 or EL CID file and frequency assignment process must be followed. If the equipment is currently in the AF inventory there should be an existing DD Form 1494/J-12 or EL CID file already on file.

6.47.2. Direct Commercial Sales (DCS). If a US manufacturer owns the equipment to be transferred directly to a foreign government, that process is called DCS. Unlike FMS sales, DCS are negotiated directly between the foreign government and the US manufacturer without the Pentagon serving as an intermediary. The equipment involved is typically slightly different from the equipment that same US manufacturer built for or sold to the US government. The US manufacturer must obtain any required spectrum support from the FCC for developmental and operational tests, if needed. Essentially, neither the US manufacturer nor the foreign government intends to operate the equipment within the US&P on a permanent basis.

6.47.3. However, there exists a hybrid scenario whereby a US manufacturer makes a sale to a foreign government via the DCS process with FMS support. The foreign government is accepting equipment directly from the US manufacturer but training on that equipment will occur in the US&P through a DoD systems PO. For example, US-type aircraft/equipment being sold to an allied country with training on that new aircraft/equipment being provided by the USAF. These equipments may have RF-dependent equipment on board that operates similarly to that of the AF. In these instances, spectrum support must be obtained through AF channels for developmental testing and eventually, operational testing and training.

6.47.4. AFSMO will challenge ownership on all "Experimental/Temporary" frequency assignment proposals. If the AF does not have clear ownership, then AFSMO will ask for clarification.

6.48. Contractor-Owned Equipment. According to the NTIA Manual, a determination of responsibility; whether the radio station/equipment is owned or operated by the Government or the Contractor, must be made prior to requesting spectrum support.

6.48.1. If the AF has accepted and taken possession/ownership of the equipment then the AF must apply for spectrum support through the NTIA process. If the equipment is being manufactured under direct AF contract, the AF must provide spectrum support through the NTIA process.

6.48.2. If the equipment being supported is not in direct support of an AF contract, then the contractor must apply to the FCC for the license to develop/test/operate the equipment.

6.49. Air Force Auxillary (AFAUX)/Civil Air Patrol (CAP). AFAUX/CAP, an auxiliary of the AF under Title 10 U.S.C., Chapter 909, is a nonprofit, civilian corporation under Title 36 U.S.C., Chapter 403. It receives support from DoD and other departments or agencies of the US under Title 10 U.S.C.

6.49.1. The AFAUX/CAP function and organization is contained in AFI 10-2701. The processing of spectrum interference reports is outlined in AFI 10-707. AFAUX/CAP follows AF procedures for processing their spectrum support requirements: AFAUX/CAP will process spectrum requirements through AETC; AETC will process AFAUX/CAP requirements in accordance with the current level guidance.

6.49.2. AFAUX/CAP may use frequencies as needed to support daily operations in addition to AF assigned operations.

6.49.3. AFSMO will maximize the use of regional and the US&P frequency assignments to meet AFAUX/CAP spectrum requirements and registration in the GMF. Exceptions will encompass requirements, which require GMF registration as defined or required by the NTIA for management of spectrum use in the US, most notably, stations within border zone areas (Canada and Mexico), on federal real estate, at civil airports and stations in proximity to high-density metropolitan or military area facilities. Other location specific stations operating under the auspices of regional or US&P assignments will be registered in FRRS.

6.50. Land Mobile Radio (LMR) 30-88, 138-144, 148-150.8, 162-174, 380-399.9, and 406-420 MHz. Because of extreme congestion in the 162-174 MHz band, new LMR frequency assignments are usually made in the 138-144, 380-399.9, or 406.1-420 MHz bands unless use of another band is needed for operational reasons. No one solution works everywhere; therefore, to ensure LMR frequencies are available before deploying equipment overseas, MAJCOMs must contact the appropriate service component for guidance. The following conditions, restrictions and special provisions apply:

6.50.1. 30-88 MHz, refer to the Supplement to the NTIA Manual for complete guidance pertaining to use in this band. This band can only be used when approved by FCC.

6.50.1.1. 29.89-50 MHz band. Government and non-government agencies share this band and available frequencies are very limited. Frequency channels begin with 29.90 MHz and move up the band in 20 kHz increments.

6.50.2. 138-144 MHz band. The military services are the primary users in this band. Channels begin with 138.0125 MHz and move up the band in 12.5 kHz increments.

6.50.2.1. All equipment in this band must operate within a 12.5 kHz narrowband channel.

6.50.3. 148-150.8 MHz band. This band is allocated for non-government mobile-satellite (earth-to-space) operations, on a shared basis with government stations.

6.50.3.1. All equipment in this band must operate within a 12.5 kHz narrowband channel.

6.50.3.1. **(USAFE)** Any CAP units within the EUCOM AOR will request frequency requirements through their servicing ISM.

6.50.4. 162-174 MHz band. Please refer to the Supplement to the NTIA Manual for complete guidance pertaining to use in this band. This band is used primarily by non-military government agencies. AF users will satisfy new LMR and pager requirements from other frequency bands. Channels begin with 162.000 MHz and move up the band in 12.5 kHz increments.

6.50.4.1. All equipment in this band must operate within a 12.5 kHz narrowband channel.

6.50.4.2. AF assignments in the 162-174 MHz band are only made when:

6.50.4.2.1. The frequency is needed for dual-channel operation with an existing net.

6.50.4.2.2. The frequency of an existing net must be changed because of interference problems.

6.50.4.2.3. An existing assignment is shared with another unit at the same location.

6.50.5. 406.1-420 MHz band. Please refer to the Supplement to the NTIA Manual for complete guidance pertaining to use in this band. This band is used primarily by non-military agencies. Channels begin with 406.0125 MHz and move up the band in 12.5 kHz increments.

6.50.5.1. All equipment in this band must operate within a 12.5 kHz narrowband channel.

6.50.6. Off-channel Assignment. AF users will adjust existing off-channel assignments within the US&P that do not conform with the MCEB channeling plan (e.g., 148.065 or 150.195) as soon as possible.

6.50.6.1. Spectrum managers at all levels should look for practical, economical opportunities to realign such off-channel frequency assignments.

6.50.6.2. The following special provisions apply to AF users of LMR frequencies not conforming to the MCEB channeling plan:

6.50.6.2.1. When an AF unit is planning to replace off-channel equipment, the commander must determine whether to obtain an on-channel frequency

assignment before the equipment is ordered.

6.50.6.2.2. When an off-channel LMR net is receiving interference from an on-channel system and a frequency change is the most economic way to solve the problem, change the off-channel net.

6.50.6.2.3. If all the equipment on an off-channel net is turned in, delete the frequency assignment immediately. Do not reserve the off-channel frequency assignment for a new unit.

6.51. Narrowbanding. AF owned or leased LMR systems operating in the US&P in the bands in the 138-150.8, 162-174, 380-399.9, and 406.1-420 MHz bands must be narrowband capable. Any AF system that is not narrowband compliant will operate on a NIB to all other narrowband users.

6.52. Trunked Land Mobile Radio (TLMR) Systems. All TLMR systems require SPS approval prior to the application for frequency assignment. Installation of a TLMR requires consolidation of all TLMR nets. Federal agencies managing TLMRs shall allow access by other federal agencies where such access is technically and operationally feasible. All TLMR proposal requests for operation in the US&P must include a current SPS and IRAC docket number. Delete conventional frequencies as you receive approval for the new narrowband frequencies.

6.53. Receive-Only Systems. Though these systems do not require MCEB allocations, submit a DD Form 1494 or EL CID file to:

6.53.1. Provide interference protection, update the SXXI, and conduct EMC studies.

6.53.1. **(USAFE)** Trunked Land Mobile Radio (TLMR) Systems within EUCOM and AFRICOM AOR. The Spectrum Planning Subcommittee (SPS) and Interdepartmental Radio Advisory Committee (IRAC) responsibilities apply to the United States and its possessions (US&P). USAFE-AFAFRICA trunked TLMR frequency usage will be managed at base level. Bases must identify and delete frequencies no longer required. Base ISMs and TLMR managers must consider the base's responsibility to transitory forces. A sufficient number of frequencies must be maintained to assure these forces can be incorporated into the trunked infrastructure.

6.53.2. Process coordination contours for the NTIA Manual for operational (Stage 4) receive-only satellite communications terminals.

6.54. Commercial Antennas on Federal Property. Commercial vendors may request the installation of commercial antennas on AF property. To ensure no adverse impacts to DoD systems, commanders and/or agency directors shall coordinate requests through the Base Civil Engineering Real Property Office for the placement of new telecommunications services on AF property. The vendor will provide information to JSC for an EMI radiation hazard analysis at their own expense. The ISM may facilitate in these procedures. Refer to AFI 32-9003, *Granting Temporary Use of Air Force Real Property*, for additional information.

6.55. Built-In Test Equipment. With the exception of GPS re-radiating equipment, this equipment does not require a DD Form 1494 or an EL CID file unless it exceeds the

technical criteria in the NTIA Manual or if the intended use is outside the US&P. Frequency assignments are required for built-in test equipment.

6.56. Electronic Warfare (EW). EW is a military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. EW consists of three aspects: electronic attack (EA), electronic protection (EP), and electronic warfare support (EWS).

6.56.1. EW, in general, and EA, in particular, is not recognized as an authorized service by the National Level approval authority, (i.e. NTIA and FCC). Additionally, there are strict controls for the use of frequency bands controlled or shared with the FAA because of safety-of-life issues relating to commercial aviation flight routes and terminals. With proper coordination, EA may be performed under the condition that harmful interference will not be caused to authorized services.

6.56.2. Performing EA for Testing, Training and Exercies in the U.S. and Canada. Frequency bands are not allocated for EW operations, testing or training. Therefore, it will be necessary to coordinate planned EW testing and training events using the EA approval process defined in CJCSM 3212.02B, *Performing Electronic Attack in the United States and Canada for Tests, Training, and Exercises*, and CJCSM 3212.03, *Performing Tests, Training, and Exercises Impacting the Global Positioning System (GPS) in the United States and Canada*. These procedures are recognized by the NTIA as the official guidance for coordination and frequency clearance procedures for performing EA.

6.56.3. AFSMO is the Air Force approval authority for EA and jamming requests for AF EW events within the US&P and Canada. EA requests for frequency clearance outside of the US&P and Canada is accomplished by submitting the EA request according to theater policies and procedures.

6.57. Commercial off-the-Shelf (COTS). COTS devices must remain unmodified as procured to maintain the definition. Paragraph 2.4.18 identifies COTS exempt from frequency process. Process all others through the normal DoD spectrum approval process. DoD requires a frequency assignment registered in the FRRS.

6.57.1. **(Added-USAFE)** COTS equipment can be an effective and relatively inexpensive alternative to MILSPEC communications equipment. US Forces are not permitted to acquire COTS equipment and start using it without proper approval. Aside from the COTS exceptions discussed in paragraph 4.4.21., all COTS items must go through the DD1494 process in order to get approval for spectrum support. It does not matter if the item is manufactured in - and used commercially in - the country for which the USAF wants to use it. We are required by our host nations to obtain supportability for all equipment that emits RF.

7. Windmill Operations.

7.1. The advent of large (250-foot-tall and greater) wind turbines, or “windmills” for power production has raised the issue of possible effects on the performance of ATC radars. Windmills with heights up to 700 feet above ground level are being installed on sites throughout the United States. As noted in the NTIA Technical Report TR-08-454,

Assessment of the Effects of Wind Turbines on Air Traffic Control Radars, radar reflections can mask the true radar return. **http://www.its.bldrdoc.gov/pub/ntia-rpt/08-454**/.

7.2. Because of potential flight obstruction concerns, windmill site developers are required to coordinate proposed site locations near or close to ATC facilities with the FAA. Figure 7.1 describes the coordination process following this notification to notify affected MAJCOMs of proposed windmill sites with the affected area of operation.

7.2.1. AFSMO will receive the notification from NTIA and will forward to all affected MAJCOMS. If a MAJCOM has concerns regarding the proposed location of a wind turbine site, it will return a proposed rebuttal and contact information to AFSMO. The NTIA will compile concerns and prepare an official Response Letter to the Windmill developer. As required, the involved MAJCOM/ISM will be required to directly engage the Windmill developer to resolve conflicts. If the MAJCOM/ISM cannot resolve the identified concerns with the Windmill developer, then these concerns should be elevated through appropriate chain of command to the local Congressman or State Senator for intervention or resolution.

8. Electromagnetic Spectrum Data Sharing

8.1. The electromagnetic environment (EME) is a critical shared joint-use environment that must be effectively controlled in order to enable successful military operations. In order to effectively share spectrum data, it must be timely, comprehensive, relevant, accurate, and trusted.

8.2. DoDI 8320.05, *Electromagnetic Spectrum Data Sharing*, 18 August 2011, establishes policy, assigns responsibilities, and provides procedures for the collection, provision, maintenance, and sharing of timely, comprehensive, relevant, accurate, and trusted data used to characterize spectrumdependent systems and define the EME.

8.3. Electromagnetic Spectrum Data Community of Interest (COI): A COI is a strategic approach for developing the agreements necessary for meaningful information exchange, and doing so collaboratively across the community of stakeholders who share a common interest. The spectrum data COI is established and functions, in accordance with DoD 8320.02-G, to ensure spectrum-related data identification, standardization, collection, provision, and maintenance is provided for meeting the needs of the DoD.

8.4. AF spectrum stakeholders and spectrum dependent system developers shall:

8.4.1. Implement procedures to ensure that all data generated at each state of the spectrum certification process is complete, accurate, and in conformance with published spectrum-related data standards.

8.4.2. Ensure that all spectrumdependent system(s) acquisition submit spectrum-related data via the DoD data capture, supportability tracking and data maintenance capabilities throughout the spectrumdependent system life cycle

8.4.3. Provide AFSMO with operational lessons learned and spectrum-related data feedback.

8.4.4. Ensure that all current and future spectrum-related data assets are made consistent with DoDI 8320.05.

Michael J. Basla, Lt Gen, USAF
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(USAFE)

MICHELLE L. HAYWORTH, Colonel, USAF
Director, Communications

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

Title 5, U.S.C., Section 552, (b) (1), *Government Organizations and Employees*

Title 10 U.S.C., *Armed Forces*, Chapter 909, *Civil Air Patrol*

CFR Title 47 U.S.C., *Telegraphs, Telephones, and Radiotelegraphs*, Section 151 et seq., *The Communications Act of 1934*

CFR Title 47 U.S.C., Part 15, *Radio Frequency Devices*

CFR Title 47 U.S.C., Part 18, *Industrial Scientific and Medical Equipment*

CFR Title 47 U.S.C., Part 25, *Satellite Communications*

CFR Title 47 U.S.C., Part 73, *Radio Broadcast Services*

CFR Title 47 U.S.C., Part 95, *Personal Radio Services*

CFR Title 47 U.S.C., Part 95, Subpart 95.191, *Eligibility and Responsibility*

CFR Title 47 U.S.C., Part 95, Subpart 95.192, *Authorized Locations*

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CJCSI 6232.01D, *LINK-16 Spectrum Deconfliction,* 20 December 2007

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CJCSM 3212.02C, *Performing Electronic Attack in the United States and Canada for Tests, Training, and Exercises,* 20 March 2011

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AFI 10-706, *Electronic Warfare (EW), 3 November 2010*

AFI 10-707, *Spectrum Interference Resolution Program,* 20 June 2005

AFI 10-2701, *Organization and Function of the Civil Air Patrol,* 29 July 2005

AFI 16-201, *Air Force Foreign Disclosure and Technology Transfer Program,* 1 December 2004

AFI 31-401, *Information Security Program Management,* 1 November 2005

AFI 32-9003, *Granting Temporary Use of Air Force Real Property,* 19 August 1997

AFI 33-106, *Managing High Frequency Radios, Personal Wireless Communication Systems, and the Military Affiliate Radio System,* 9 January 2002

AFI 33-111, *Voice Systems Management,* 24 March 2005

AFI 33-134, *Mobile Satellite Services (MSS) Management,* 10 February 2005

AFI 33-201, *Communications Security (COMSEC),* 1 May 2005

AFMAN 33-363, *Management of Records,* 1 March 2008

AFPD 31-4, *Information Security,* 1 September 1998

AFPD 33-1, *Information Resources Management, 27 June 2006*

AFTTP(I) 3-2.49, *Multi-Service Tactics, Techniques, and Procedures for HAVE QUICK Radios,* May 2004

Assistant Secretary of Defense/Command, Control, Communications and Intelligence (ASD[C3I]) Policy Letter, *DoD Policy Letter on Managing MSS,* August 29, 2001

Prescribed Forms

None.

Adopted Forms

DD Form 1494, *Application for Equipment Frequency Allocation*

USMCEB Pub 7, *Standard Frequency Action Format (SFAF)*

Abbreviations and Acronyms

AAG—Aeronautical Assignment Group

AC&W—Aircraft Control and Warning

ACP—Allied Communications Publication

AETC—Air Education and Training Command

AF—Air Force

AFAUX/CAP—Air Force Auxilliary/Civil Air Patrol

AFC—Area Frequency Coordinator

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFMC—Air Force Material Command

AFNIC—Air Force Network Integration Center

AFPD—Air Force Policy Directive

AFRIMS—Air Force Records Information Management System

AFSAT—Air Force Satellite Communications

AFSIR—Air Force Spectrum Interference Resolution

AFSMO—Air Force Frequency Management Agency

AFSPC—Air Force Space Command

AFTRCC—Aerospace and Flight Test Radio Coordinating Council

AGL—Above Ground Level

AM—Amplitude Modulation

ANG—Air National Guard

ANGRC—ANG Readiness Center

AOR—Area of Responsibility

ASD (NII)—Assistant Secretary of Defense (Networks and Information Integration)

ASOS—Automated Surface Observation System

ASR—Airport Surveillance Radar

ATC—Air Traffic Control

ATIS—Automatic Terminal Information System

AWOS—Automated Weather Observation System

CB—Citizen Band

C-E—Communications-Electronics

CFR—Code of Federal Regulations

CJCSI—Chairman of the Joint Chiefs of Staff Instruction

CJCSM—Chairman of the Joint Chiefs of Staff Manual

COCOM—Combatant Command

CONUS—Continental United States

COTS—Commercial-off-the-Shelf

DAO—Defense Attaché Office

dB—Decibel

dBi—dB referred to an Isotropic Antenna

dBw—dB referred to 1 Watt

DCS—Direct Commercial Sales

DII—Defense Information Infrastructure

DISA—Defense Information Systems Agency

DME—Distance Measuring Equipment

DoC—Department of Commerce

DoD—Department of Defense

DoDD—Department of Defense Directive

DoDI—Department of Defense Instruction

DoT—Department of Transportation

DSN—Defense Switched Network

DSO—Defense Spectrum Organization

DSP—Defense Standardization Program

E-mail—Electronic Mail

EA—Electronic Attack

EIRP—Effective Isotropic Radiated Power

EL CID—Equipment Location-Certification Information Database

EMC—Electromagnetic Compatibility

EMCP—Electromagnetic Compatibility Program

EME—Electromagnetic Environment

EMI—Electromagnetic Interference

ESG—Equipment Spectrum Guidance

ESMC—Eastern Space and Missile Center

EUCOM—United States European Command

ETCAS—Enhanced Traffic Alert and Collision Avoidance System

EW—Electronic Warfare

FAA—Federal Aviation Administration

FAS—Frequency Assignment Subcommittee

FCC—Federal Communications Commission

FDO—Field Disclosure Office

FLIP—Flight Information Publications

FLTSAT—Fleet Satellite Communications

FMS—Foreign Military Sales

FP—Frequency Panel (MCEB)

FRRS—Frequency Resource Records System

FRS—Family Radio Service

FSS—Fixed Satellite Service

GHz—Gigahertz

GMF—Government Master File

GMRS—General Mobile Radio Service

HF—High Frequency

HN—Host Nation

HNSWDO—Host Nation Spectrum Worldwide Database Online

HQ—Headquarters

HQ ACC—Headquarters Air Combat Command

HQ AETC—Headquarters Air Education and Training Command

HQ AFMC—Headquarters Air Force Material Command

HQ AFRC—Headquarters Air Force Reserve Command

HQ AFSPC—Headquarters Air Force Space Command

HQ AMC—Headquarters Air Mobility Command

ICAO—International Civil Aviation Organization

IFF—Identification Friend or Foe

ILS—Instrument Landing System

IMT—Information Management Tool

Inmarsat™—International Maritime Satellite

IRAC—Interdepartment Radio Advisory Committee

ISM—Installation Spectrum Manager

ISR—Inter-Squad Radio

ISS—Inter-Satellite Service

ITU—International Telecommunications Union

J/F—12—MCEB ESG Permanent Working Group process

JFMO—Joint Frequency Management Office

JFP—Joint Frequency Panel

JSC—Joint Spectrum Center

JSIR—Joint Spectrum Interference Resolution

JSUG—JTIDS/MIDS Spectrum Users Guide

JTF—Joint Task Force

JTIDS—Joint Tactical Information Distribution System

kHz—Kilohertz

km—Kilometer

LF—Low Frequency

LMR—Land Mobile Radio

LORAN—Long-Range Aid to Navigation

LOS—Line-of-Sight

LRR—Long-Range Radar

MAG—Military Advisory Group

MAJCOM—Major Command

MARS—Military Affiliate Radio System

MF—Medium Frequency

MHz—Megahertz

MIDS—Multifunctional Information Distribution System

MILACAS—Military Aircraft Collision Avoidance System (XR = Extended Range, FR = Formation Rendezvous)

MILDEP SMO—Military Service Spectrum Management Office

MLS—Microwave Landing System

MM—Maritime Mobile

MMLS—Mobile Microwave Landing System

MOA—Memorandum of Agreement

MOU—Memorandum of Understanding

MSS—Mobile Satellite Services

MURS—Multi-Use Radio Service

NAS—National Airspace System

NASA—National Aeronautics and Space Administration

NATO—North Atlantic Treaty Organization

NAVAID—Navigational Aid

NDB—Non-Directional Beacons

NGB—National Guard Bureau

NIB—Non-Interference Basis

NLT—Not Later Than

nmi—Nautical Mile

NOAA—National Oceanic & Atmospheric Administration

NTH—Note to Holder

NTIA—National Telecommunications and Information Administration

PAR—Precision Approach Radar

POC—Point of Contact

PPS—Pulses Per Second

PRR—Pulse Repetition Rate

PWG—Permanent Working Group

RACES—Radio Amateur Civil Emergency Services

RDS—Records Disposition Schedule

RF—Radio Frequency

RFA—Radio Frequency Authorization

RFI—Radio Frequency Interference

RSEC—Radar Spectrum Engineering Criteria

RX—Receiver

SAF—Secretary of the Air Force

SAR—Search and Rescue

SATURN—Second-Generation Anti-Jam Tactical UHF Radio for NATO

SAV—Staff Assistance Visit

SCS—Spectrum Certification System

S-D—Spectrum-Dependent

SFAF—Standard Frequency Action Format

SGLS—Space-Ground Link Subsystem

SIF—Selective Identification Feature

SINCGARS—Single Channel Ground and Airborne Radio System

SIPRNET—Secret Internet Protocol Router Network

SKE—Station Keeping Equipment

SKEFO—Station Keeping Equipment Follow-On

SM—Spectrum Management

SMC—Space and Missile Center

SMO—Spectrum Management Office

SPO—Systems Program Office

SPS—Spectrum Planning Subcommittee

SSRA—Spectrum Supportability Risk Assessments

SSV—Standard Service Volume

STA—Special Temporary Authorization

TACAN—Tactical Air Navigation

TACC—Tanker Airlift Control Center

TADIL—Tactical Digital Information Link

TAG—The Adjutant General

TCAS—Traffic Alert and Collision Avoidance System

TLMR—Trunked Land Mobile Radio

UHF—Ultra High Frequency

US—United States

USAF—United States Air Force

USB—Unified S-Band

U.S.C.—United States Code

USCENTCOM—United States Central Command

USD [AT&L]—Under Secretary of Defense for Acquisition, Technology, and Logistics

USMCEB—United States Military Communications-Electronics Board

US&P—United States and its Possessions

USPACOM—United States Pacific Command

VHF—Very High Frequency

VOR—VHF Omnidirectional Range

VORTAC—VOR Tactical Air Navigation

WSMC—Western Space and Missile Center

XP—Programs Office

Terms

NOTE: **The following definitions of frequency management terms were extracted from international, national, and DoD regulations and directives. Where appropriate, the source is given in parentheses following each definition: (RR)**—International Telecommunications Union Radio Regulations; (NTIA)—National Telecommunications and Information Administration Manual of Regulations and Procedures for Federal Radio Frequency Management.

Allocation (of a frequency band)—Entry in the Table of Frequency Allocations of a given frequency band for its use by one or more (terrestrial or space) radio communication services or the radio astronomy service under specified conditions. This term also applies to the frequency band concerned (RR).

Allotment (of a radio frequency or radio frequency channel)—Entry of a designated frequency channel in an agreed plan, adopted by a component conference, for use by one or more administrations for a (terrestrial or space) radiocommunication service in one or more identified countries or geographical areas and under specified conditions (RR).

Assigned Frequency—The center of the frequency band assigned to a station (NTIA).

Assignment (of a radio frequency or radio frequency channel)—Authorization given by an administration for a radio station to use a RF or radio frequency channel under specified conditions (RR).

Broadcasting Service—A radiocommunication service in which the transmissions are intended for direct reception by the general public. This service may include sound, television, or other types of transmissions (RR).

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

Characteristic Frequency—A frequency easily identified and measured in a given emission. A carrier frequency may, for example, be designated as the characteristic frequency (RR). (See also Reference Frequency).

Commercial-off-the-Shelf (COTS)—C-E equipment that can be procured by the general public wholesale or retail.

Communications-Electronics (C-E)—The specialized field concerned with the use of electronic devices and systems for the acquisition or acceptance, processing, storage, display, analysis, protection, disposition, and transfer of information.

Coordination Distance—Distance on a given azimuth from an Earth station beyond which a terrestrial station, sharing the same frequency band, neither causes nor is subject to interference emissions greater than a permissible level (RR).

Data Item—A SFAF data item is made up of a data item number, a data item security classification indicator (if required), and the data entry.

Data Item Number—The number (also referred to as a data item identifier) used to identify each data item in a SFAF frequency assignment transaction. It consists of a unique 3-digit number followed by a period and a space. For example, 005 is used to identify the record's security classification.

Earth Station—A station located either on the Earth's surface or within the major portion of the Earth's atmosphere and intended for communication with one or more space stations, or with one or more stations of the same kind by means of one or more reflecting satellites or other objects in space (RR).

Electromagnetic Compatibility (EMC)—(1) The condition that prevails when telecommunications equipment is performing its individually designed function in a common EM without causing or suffering unacceptable degradation due to unintentional EMI to or from other equipment in the same environment (NTIA). (2) DoD: The ability of systems, equipment, and devices that utilize the EM spectrum to operate in their intended operational environments without suffering unacceptable degradation or causing unintentional degradation because of EM radiation or response. It involves the application of sound EM spectrum management; system, equipment, and device design configuration that ensures interference-free operation; and clear concepts and doctrines that maximize operational effectiveness (Joint Publication [JP] 1-02).

Electromagnetic Interference (EMI)—Any EM disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics or electrical equipment. It can be induced intentionally, as in some forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and the like.

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

Electronic Warfare (EW)— Military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum to attack the enemy. EW consists of three divisions: electronic attack, electronic protection, and electronic warfare support. (JP 1-02)

Foreign Disclosure—The approval to release technical information from the DD Form 1494.

Frequency Allocation—See Allocation (of a frequency band).

Frequency Assignment—See Assignment (of a radio frequency or radio frequency channel).

Frequency Assignment, Group—A frequency assignment made only to terrestrial stations and provides authority to operate but does not represent continuing operations, or provide an assignment for planning purposes (3.2.4.) (NTIA).

Frequency Assignment, Permanent—An assignment made for an unspecified period of time, subject to the provisions of the NTIA Manual of Federal Regulations 8.2.6. (NTIA 9.6.3.).

Frequency Assignment, Temporary—A frequency assignment for a specified period of time, more than 90 calender days but less than five years. Temporary assignments will have a SFAF Item 141 (expiration date), but may be renewed for additional periods, if necessary. Coordinate this type of assignment at the national level and submit to the FAS for approval and recommendation to the NTIA for assignment. The assignment is entered into the GMF with an appropriate expiration date. Air Force users may apply for a STA for up to 90 calender days. This type of authorization is not entered into the GMF. STAs are renewable up to a total of 180 calender days from the initial date of assignment. Limit STAs to urgent requirements.

Frequency Coordination—The process of obtaining approval to use the RF spectrum via arrangements and technical liaison for the purpose of minimizing harmful interference through cooperative use of the RF spectrum. To be effective, the coordination must extend through the planning, proposal, and actual in use phases of radio frequency utilization.

Frequency Tolerance—The maximum permissible departure by the center frequency of the frequency band occupied by an emission from the assigned frequency, or by the characteristic frequency of an emission from the reference frequency expressed in parts per million or Hz (RR).

Harmful Interference—Interference that endangers the functioning of a radio navigation service or of other services, or seriously degrades, obstructs, or repeatedly interrupts a radio communications service operating in accordance with the ITU Radio Regulations (RR).

Hertz (Hz)—A unit of frequency equal to one cycle per second (NTIA).

Identification Friend or Foe (IFF)—A system using electromagnetic transmissions to which equipment carried by friendly forces automatically responds, for example, by emitting pulses, thereby distinguishing themselves from enemy forces.

Industrial, Scientific, and Medical Applications (of radio frequency energy)—Operation of equipment or appliances designed to generate and use local RF energy for industrial, scientific, medical, domestic, or similar purposes, excluding applications in the field of telecommunications (RR).

Instrument Landing System (ILS)—A system of radio navigation intended to assist aircraft in landing which provides lateral and vertical guidance, which may include indications of distance from the optimum point of landing (JP 1-02). A radionavigation system that provides aircraft with horizontal and vertical guidance just before and during landing and, at certain fixed points, indicates the distance to the reference point of landing (RR).

Interference—The effect of unwanted energy due to one or a combination of emissions, radiations, or inductions upon reception in a radio communication system, manifested by any performance degradation, misinterpretation, or loss of information that could be extracted in the absence of such unwanted energy (RR).

Ionospheric Sounder—A device that transmits signals for the purpose of determining ionospheric conditions (NTIA).

Land Station—A station in the mobile service not intended to be used while in motion (RR).

Low Power—Devices that operate according to the specifications listed in the NTIA Manual, Annex K.

Maritime Mobile Service—A mobile service between coast stations and ship stations, or between ship stations, or between associated on-board communication stations; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service (RR).

Marker Beacon—A transmitter in the aeronautical radionavigation service that vertically radiates a distinctive pattern to provide position information to aircraft (RR).

Mean Power (of a radio transmitter)—The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions (RR).

Microwave Landing System (MLS)—A radionavigation system that provides the same information as an ILS but operates in the 5000-5250 MHz band.

Mobile Service—A radiocommunication service between mobile and land stations, or between mobile stations (RR).

Mobile Station—A station in the mobile service intended to be used while in motion or during halts at unspecified points (RR).

Necessary Bandwidth—For a given class of emission, the width of the frequency band, which is minimally sufficient to ensure the transmission of information at the rate, and with the quality, required under specified conditions (RR).

NTIA Manual—A DoC Manual of Regulations and Procedures for Federal Radio Frequency Management.

Peak Envelope Power (PEP) (of a radio transmitter)—The average power supplied to the antenna transmission line by a transmitter during one RF cycle at the crest of the modulation envelope taken under normal operating conditions (RR).

Radio Astronomy—Astronomy based on the reception of radio waves of cosmic origin (RR).

Radio Frequency Spectrum—The RF spectrum includes the frequencies from 3.0 kHz to 400 GHz. The presently allocated spectrum is from 9 kHz to 300 GHz.

Radiolocation—Radiodetermination used for purposes other than those of radionavigation (RR).

Radiosonde—An automatic radio transmitter in the meteorological aids service usually carried on an aircraft, free balloon, kite, or parachute, and which transmits meteorological data. (NTIA).

Range Commander—In this instruction, the commander of an AF test or tactical range.

Reference Frequency—A frequency having a fixed and specific position with respect to the assigned frequency. The displacement of this frequency with respect to the assigned frequency has the same absolute value and sign that the displacement of the characteristic frequency has with respect to the center of the frequency band occupied by the emission (RR). (See also Characteristic Frequency.)

Shared-Use Facilities—Any site or installation that has more than one DoD department, agency, or unit. The facilities frequency concerns should be filtered through the “host” agency.

Space Station—A station located on an object, which is beyond, is intended to go beyond, or has been beyond, the major portion of the earth's atmosphere (RR).

Spurious Emission—Emission on a frequency or frequencies that are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation products and frequency conversion products, but exclude out-of-band emissions (RR).

Standard Frequency and Time Signal Service—A radio communication service for scientific, technical and other purposes, providing the transmission of specified frequencies, time signals, or both, of stated high precision, intended for general reception (RR).

Telecommunication—Any transmission, emission, or reception of signs, signals, writings, images, and sounds or information of any nature by wire, radio, visual or other EM systems (RR).

Telemetry—The use of telecommunication for automatically indicating or recording measurements at a distance from the measuring instrument (RR).

United States and its Possessions (US&P)—For use only when transmitting and/or receiving throughout the US (50 States and District of Columbia), the Commonwealth of Puerto Rico, and the Territories and Possessions (does not include the former Trust Territory of the Pacific Islands).

Attachment 1 (USAFE)

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

Adopted Forms

AF2519, *All Purpose Checklist*

Terms

Non-Interference Basis—Assignments approved with the comment "NIB" means users may not cause interference to other users, and if interfered with by another valid frequency assignment the user must accept this interference.

Attachment 2

FREQUENCY ASSIGNMENT CLASSIFICATION REFERENCE

A2.1. Security Classification. This attachment is a reference used for Air Force specific frequency assignment requirements. As a reference it explains the handling and retention of the classification of frequency assignments, whereas the DoD 5200.1R and AFI 31-401 are general in nature. This attachment is reference only and is not to be used as a classification source.

A2.1.1. Primarily the association with the function they support determines security classification of DoD and Federal Government frequency assignments and the information in them. Classify individual data items according to DoD 5200.1-R and AFI 31-401.

A2.2. Individual Air Force Frequency Assignments.

A2.2.1. The following frequency assignment information, standing alone or in combination and not associated with any other assignment information, is UNCLASSIFIED. Mark these items as (U) in the SFAF.

A2.2.1.1. Overall classification of the frequency assignment (SFAF Item 005).

A2.2.1.2. Security classification modification (SFAF Item 006).

A2.2.1.3. Type of action (SFAF Item 010).

A2.2.1.4. Agency serial number (SFAF Item 102).

A2.2.1.5. IRAC docket number (SFAF Item 103).

A2.2.1.6. List serial number (SFAF Item 105).

A2.2.1.7. Serial replaced, delete date (SFAF Item 106).

A2.2.1.8. Docket number of older authorizations (SFAF Item 108).

A2.2.1.9. Operating frequency or frequency band and excluded frequency or frequency band(SFAF Items 110 and 111).

A2.2.1.10. Agency (SFAF Item 200).

A2.2.1.11. Command (SFAF Item 204).

A2.2.1.12. IRAC Notes (SFAF Item 500).

A2.2.1.13. Frequency action officer (SFAF Item 701).

A2.2.1.14. Control/request number (SFAF Item 702).

A2.2.2. Classify other assignment information, standing alone or in combination with other information (including A2.2.1.), according to DoD 5200.1-R and AFI 31-401 by the appropriate classification authority. Include the appropriate classification marking with the corresponding SFAF Item.

A2.3. Lists of Air Force Frequency Assignments.

A2.3.1. Most individual frequency assignment records in the Radio Frequency Authorization (RFA) are individually unclassified, classify the total RFA according to the highest classification level of the assignments it contains. Lists (two or more frequencies) of

unclassified frequency assignment records in a given range of frequencies, or in a given area, can be categorized as sensitive, but unclassified because they may provide information leading to the disclosure of military or national security-related operations and scientific and technological matters relating to national security. These lists can indicate the overall strategic telecommunications capabilities of the US, and their disclosure could cause damage to national security. The continued protection of this information is essential to national security because it pertains to communications security and reveals vulnerabilities and capabilities. Its unauthorized disclosure can reasonably be expected to result in nullifying the effectiveness of telecommunications networks and the capability of the US.

A2.3.2. The USMCEB-M-019-98 gives guidance on classifying compilations of frequency assignment records. Based on this guidance:

A2.3.2.1. Classify RFAs or frequency lists at the highest level of any individual frequency assignment it contains.

A2.3.2.2. When RFAs or frequency lists contain the aggregation of UNCLASSIFIED DoD, MILDEP, or NSA frequency assignment records, classify it CONFIDENTIAL, except as exempted by paragraph A2.5.

A2.3.2.3. An RFA or frequency list containing only UNCLASSIFIED assignments of one unit or location is considered UNCLASSIFIED. For example, to select all records where SFAF data Item 200 (Agency) = USAF would result in a CONFIDENTIAL aggregate list; whereas, select all records where SFAF Item 301 (Transmitter Location) or 401 (Receiver Location) = Hill would result in an UNCLASSIFIED aggregate list. Users that plan to operate in an UNCLASSIFIED environment should select from the FRRS only UNCLASSIFIED records applicable to their operational requirements.

A2.4. Marking.

A2.4.1. All DoD frequency assignment material must contain proper warnings/markings, as outlined, whether computer-generated or manually applied. Mark DoD data extracted from frequency assignment databases with one of the following warning statements, depending upon which category is applicable.

A2.4.2. Mark documents/material containing UNCLASSIFIED frequency assignment records/data classified CONFIDENTIAL under Section 3 of the USMCEB-M-019-98 CONFIDENTIAL and carry markings according to existing DoD security regulations and AFI 31-401. For example:

Derived From: DoD Frequency Assignment Security Classification Guide
Source Dated: 1 January 1998
Declassify on: Source marked X4

A2.4.3. The documents/material will have the following warning attached:

A2.4.3.1. WARNING – This document/listing has been classified CONFIDENTIAL according to DoD Frequency Assignment Security Classification Guide. The UNCLASSIFIED frequency assignment records/data must be protected according to Section 3 of the DoD Frequency Assignment Security Classification Guide.

A2.4.3.2. The destruction of UNCLASSIFIED records/data in this document must be according to existing directives governing destruction of classified material.

A2.4.3.3. This document contains records/data that are exempt from public release under the provisions of Title 5 U.S.C., Section 552(b)(1), Public information; agency rules, opinions, orders, records, and proceedings. The release of any records to any non-DoD organization requires approval of the authority (agency) that made the assignment.

A2.4.4. Mark material containing SECRET or CONFIDENTIAL frequency assignment records and, either UNCLASSIFIED DoD frequency assignment records that meet the aggregation criteria set forth in Section 3 of the USMCEB-M-019-98 or UNCLASSIFIED DoD frequency assignment records/data extracted from the aggregated lists according to current security directives and contain the following warning statement:

A2.4.4.1. WARNING – In addition to SECRET or CONFIDENTIAL data, this document contains UNCLASSIFIED frequency assignment records/data that must be protected according to Section 3 of the DoD Frequency Assignment Security Classification Guide.

A2.4.4.2. Destroy UNCLASSIFIED records/data in this document according to existing directives governing destruction of classified material.

A2.4.4.3. This document contains records/data that are exempt from public release under the provisions of the Title 5 U.S.C., Section 552(b)(1). The release of any records to any non-DoD organization requires approval of the authority (agency) that made the assignment.

A2.4.5. Mark documents/material containing one or more UNCLASSIFIED frequency assignment record/data extracted from aggregated lists that are classified CONFIDENTIAL as set forth in Section 3 of the USMCEB-M-019-98 UNCLASSIFIED and contain the following warning:

A2.4.5.1. WARNING – This document/listing is UNCLASSIFIED; however, it contains frequency assignment records/data that you must protect according to Section 3 of the USMCEB-M-019-98.

A2.4.5.2. Destroy UNCLASSIFIED records/data in this document according to existing directives governing destruction of classified material.

A2.4.5.3. This document contains records/data that are exempt from public release under the provisions of the Title 5 U.S.C., Section 552(b)(1). The release of any records to any non-DoD organization requires approval of the authority (agency) that made the assignment.

A2.5. Exemptions.

A2.5.1. The following types of frequency assignment records are exempt from the classification requirements listed in paragraph A2.3.2.2.:

A2.5.1.1. Lists of UNCLASSIFIED frequency assignments to government users that are not intended to be public (i.e., travelers information stations, weather broadcast stations, certain stations in the maritime radio navigation and maritime mobile services, and stations in the international broadcast services).

A2.5.1.2. Lists of aeronautical station frequencies under the purview of the Aeronautical Assignment Group when used in the National Airspace System.

A2.5.1.3. Lists of UNCLASSIFIED frequency assignment records that operate on frequencies authorized to non-government stations, where such use is necessary to intercommunicate with non-government stations for coordination with non-government activities.

A2.5.1.4. Lists of frequencies in NTIA or DOD channel plans when specific location, technical parameters, and organization are not collectively included in the channel plan.

Attachment 3

MEMORANDUM OF AGREEMENT BETWEEN DEPARTMENT OF DEFENSE AND DEPARTMENT OF TRANSPORATION REGARDING THE 960-1215 MHZ FREQUENCY BAND

Recognizing the increasing use of radio frequency (RF) spectrum for commercial, civil and military purposes and its vital importance to both national defense and air traffic safety, the Department of Defense (DoD) and Department of Transportation (DoT) enter into this Memorandum of Agreement (MOA).

The 960-1215 MHz band is used by DoD for the Joint Tactical Information Distribution System (JTIDS), the Multifunctional Information Distribution System (MIDS) and other similar systems (termed collectively "Link-16" in this agreement) as a critical element of its Command and Control infrastructure. Continuing restrictions for training and operations within the United States and its Possessions (US&P) would adversely affect DoD's ability to support national security objectives.

DoT interest in this band is based on its importance for aeronautical radionavigation and supporting systems. Rapid growth in commercial and civil aviation during the 21st century will increase the importance of assuring spectrum supportability for existing and new systems that enhance air traffic safety.

In 1978 the National Telecommunications and Information Administration (NTIA) directed the Federal Aviation Administration (FAA) and DoD to work cooperatively to assure spectrum access and mutual compatibility between Link-16 and civil/commercial aeronautical radionavigation systems populating the 960-1215 MHz band. This memorandum of agreement is in conformity with the 1978 NTIA directive and takes into account technological developments, regulatory practices, and new DoT and DoD requirements.

Supporting aviation safety, national defense, and efficient use of government resources, DoT will assure spectrum access for Link-16 systems; DoD will incorporate terminal engineering features to improve those systems' compatibility in accordance with the specifications contained in this and other applicable documents; and both agencies will work cooperatively to support NTIA action to protect both Link-16 and civil/commercial aeronautical systems sharing this portion of the RF spectrum.

Recognizing a mutual interest in assuring spectrum access for critical systems, we enter into this agreement to protect use of the band in the US&P and internationally, and to advocate strongly for the tenets of this agreement as specified in Appendix A in national and international negotiations.

Paul D. Wolfowitz
Deputy Secretary of Defense

NOV 18 2002

Michael P. Jackson
Deputy Secretary of Transportation

DEC 31 2002

Appendix A

RECOGNIZING:

Treaties of the International Telecommunication Union (ITU) fully recognize the sovereign right of each State to regulate its telecommunications including all transmissions, emissions, and receptions of radio frequency signals subject to that State's jurisdiction.

Customary international law and bilateral and multilateral international agreements recognize that military aircraft, vessels, and spectrum-dependent systems are treated differently from civil and commercial aircraft, vessels, and spectrum-dependent systems. For example, the 1944 Convention on International Civil Aviation states expressly in Article 3 that it shall be applicable only to civil aircraft and shall not be applicable to state aircraft.

The 960-1215 MHz band is allocated by the Radio Regulations for Aeronautical Radionavigation Service (ARNS) and Radionavigation Satellite Service (RNSS) systems, and the development of electronic aids to navigation.

The Joint Tactical Information Distribution System (JTIDS), the Multifunctional Information Distribution System (MIDS), and other similar systems are critical to Department of Defense (DoD) missions associated with command and control and radionavigation.

FAA and DoD systems dependent upon the 960-1215 MHz spectrum must be coordinated to assure mutual spectrum access.

APPLICABILITY:

This agreement applies to MIDS terminals including MIDS Low Volume Terminal (LVT) variants (LVT-l, LVT-2. and LVT-3/Fighter Data Link); Integrated Communications Navigation and Identification Avionics (ICNIA); ITIDS terminals including ITIDS Class 1, Class 2, Class 2M, and Class 2H; and future systems incorporating the JTIDS/lMIDS waveform implementation (e.g., the Joint Tactical Radio System). For the purposes of this agreement, all these systems will be collectively referred to as "Link-16."

SPECIFICATIONS:

1. DoT and DoD will support appropriate service allocation and station class designations for systems meeting the minimum technical/regulatory requirements as specified by the NTIA and international spectrum usage agreements. Both agencies will work cooperatively to protect civil and military systems sharing the 960-1215 MHz.

2. DoD will limit uncoordinated Link-16 operations in accordance with the spectrum restrictions outlined in the NTIA Spectrum Certification as approved by the NTIA Office of Spectrum Management (OSM). Associate Administrator. Relaxation of these restrictions in the 1030-1215 MHz band on a system-by-system, case-by-case, or other appropriate basis may be approved based on Interdepartment Radio Advisory Committee (IRAC) review of

testing/documentation that concludes relaxation will not result in harmful interference to authorized users of the band. [1]

3. Upon final certification approval, DoT will support a permanent United States and its Possessions (US&P) assignment for Link-16 operations within the constraints identified in the NTIA spectrum certification.

4. DoD will ensure that by 2020, all Link-16 terminals are capable of remapping frequencies from below 1030 MHz to the sub-band above 1030 MHz. Any Link-I6 terminal produced after July 1, 2007 will be capable of remapping. These terminals are expected to begin fielding no later than January 1, 2009. All fielded Link 16 terminals will incorporate the remapping capability by 2020. Inclusion of the remapping capability in Link-I6 terminals produced prior to July 1, 2007 (ITIDS terminals excluded) will be handled when the systems are brought in for depot maintenance and/or are scheduled for other system updates to the Link-l6 terminal. DoT and DoD will meet annually to review the progress of this effort with the goal of ensuring maximum compatibility between Link 16 and aviation systems. DoD will utilize this capability as required within the US&P to prevent harmful interference to aviation systems approved by NTIA via a stage 4 spectrum support certification for operation in the 960-1215 MHz band and implemented below 1030 MHz. This capability will be utilized to remap the minimum number of frequencies required to preclude harmful interference based on approval by NTIA through the SPS process. DoD will not use the requirement to remap frequencies from the Link-16 “hopset” as a rationale for objecting to such aviation systems.

5. DoT will work with the NTIA and other Federal Agencies to ensure aviation systems subject to US Government regulation using frequencies above 1030 MHz (including Galileo, Global Positioning System (GPS) L52, and other systems with global availability) will be designed to satisfy their minimum performance standards in their intended electromagnetic environment, including Link-16 operations complying with conditions and restrictions reflected in the Link-16 NTIA spectrum certification or any subsequent certifications. DoT will also work with the Department of State, the Federal Communications Commission, the NTIA, and DoD to support the US Government’s efforts to ensure aviation systems not under US jurisdiction whose receivers may operate in the US&P (including Galileo and other systems with global availability) will be designed to the same standard outlined in the preceding text.

6. DoT will ensure that future aeronautical radionavigation systems, electronic aids to air navigation, or other systems subject to its jurisdiction that are to be implemented using spectrum in the 1030-1215 MHz band will be designed to satisfy their minimum performance standards in their intended electromagnetic environment, including Link-16 systems operating in conformance with the approved IRAC spectrum certification. DoT will also ensure future aeronautical radionavigation systems approved by NTIA via a stage 4 spectrum support certification for operation in the 960-1215 MHz band and implemented below 1030 MHz will take into account Link-16 operations within the constraints of the NTIA spectrum certification or any subsequent spectrum certifications on Link-16 frequencies not subject to remapping.

7. DoT will authorize operations exceeding the terms of this agreement on a case-by-case basis. DoT and DOD will develop coordination procedures to accommodate Link-16 training exercises

involving 51-channel operations, operations exceeding approved spectrum certification criteria, and operations involving non-US and new Link-16 terminals/platforms.

8. DoT and DoD will develop 51-channel coordination procedures regionally, taking into account the expected aviation system density and services and the DoD operating areas in that geographic location.[3]

9. DoT will not require compatibility between Link-l 6 and Universal Access Transceiver (UAT) receivers on military platforms. UAT transmitters may be required on military platforms.

10. Only those electromagnetic compatibility (EMC) features directly affected by the engineering change will be subject to re-certification. It is expected that the monitoring function can be accomplished by a suitable revision to the uniform frequency monitor.

11. DoT will not require new EMC testing or additional restrictions with regard to existing ARNS systems (Mode S, Air Traffic Control Radar Beacon System, Traffic Alert and Collision Avoidance System, Distance Measuring Equipment (DME)/N and DMFJP, and/or the 1090 Automatic Dependent Surveillance-Broadcast extended squitter) and RNSS systems (GPS L5 and Galileo) as a result of remapping.

12. DoT will promote the development of robust aviation systems that lend themselves to improved compatibility with 51-frequency JTIDS terminals through cooperation with RTCA Inc., industry, and DoD.

13. DoT and DoD will jointly submit to NTIA a recommended specification and methodology to facilitate the terminal EMC features certification of Link-16 systems operating in the 960-1215 MHz band, within 30 days of the signature of this MOA. Subsequent to NTIA approval of the specification and a successful demonstration of the implementation of the specification/methodology DoT will endorse DoD's certifying all future Link-16 terminals' compliance, eliminating the need for future NTIA EMC features demonstrations.

14. DoD and DoT will promote the terms of this agreement in international forums (e.g., DoD will encourage North Atlantic Treaty Organization (NATO) and other international Link-16 users to implement a similar, compatible remapping capability, and DoT will work with the International Civil Aviation Organization (lCAO) and other civil aviation organizations to ensure new systems will recognize that they face environments in some countries which include Link-16 electromagnetic environments as specified in the NTIA spectrum certification.

15. DoD and DoT win seek to implement all the terms of this agreement in good faith. If circumstances change, both DoD and DoT will work together to resolve any disputes. The failure by one Department to comply with the terms of the agreement may be a basis for the other Department to terminate the agreement.

[1.] Such relaxations might include higher Time Slot Duty Factor (TSDF) (in excess of 100%) and reduced geographic areas (less than 100 nm).

[2] In the event that the mitigation strategies defined in the Interagency GPS Executive Board (IGEB) "Implementation of a Third Civil GPS Signal" Final Report should prove insufficient to protect civil use of the GPS L5 signal, the option to require

remapping Link-16 carriers in the 1164-1188 MHz band in lieu of a like number of below-1030 MHz Link- 16 carriers (the total number of frequencies remapped to accommodate DoT systems shall not exceed 14) will be retained. Studies to support such an option will be developed within the Spectrum Planning Subcommittee and approved by NTIA. Conclusion of this agreement satisfies the intent of the IGEB Final Report, which states "The DoD will include a priced option in the full-rate production MIDS request for proposal (RFP) to remap up to seven selectable contiguous MIDS frequencies in the 960-1215 MHz band."

[3] Intent is to ensure the entire US&P is not restricted for a projected operational environment that exists only in the vicinity of high-density air traffic areas like Los Angeles International Airport.

[4] The baseline for all EMC Features monitoring methodology, periodic verification requirements, and procedures for the performance of EMC Features Demonstrations must be mutually established by DoD and FAA for all MIDS production and fol1ow-on terminals.

Attachment 3 (USAFE)

MEMORANDUM OF AGREEMENT BETWEEN DEPARTMENT OF DEFENSE AND DEPARTMENT OF TRANSPORATION REGARDING THE 960-1215 MHZ FREQUENCY BAND

Appendix A

RECOGNIZING:

Treaties of the International Telecommunication Union (ITU) fully recognize the sovereign right of each State to regulate its telecommunications including all transmissions, emissions, and receptions of radio frequency signals subject to that State's jurisdiction.

Customary international law and bilateral and multilateral international agreements recognize that military aircraft, vessels, and spectrum-dependent systems are treated differently from civil and commercial aircraft, vessels, and spectrum-dependent systems. For example, the 1944 Convention on International Civil Aviation states expressly in Article 3 that it shall be applicable only to civil aircraft and shall not be applicable to state aircraft.

The 960-1215 MHz band is allocated by the Radio Regulations for Aeronautical Radionavigation Service (ARNS) and Radionavigation Satellite Service (RNSS) systems, and the development of electronic aids to navigation.

The Joint Tactical Information Distribution System (JTIDS), the Multifunctional Information Distribution System (MIDS), and other similar systems are critical to Department of Defense (DoD) missions associated with command and control and radionavigation.

FAA and DoD systems dependent upon the 960-1215 MHz spectrum must be coordinated to assure mutual spectrum access.

APPLICABILITY:

This agreement applies to MIDS terminals including MIDS Low Volume Terminal (LVT) variants (LVT-l, LVT-2. and LVT-3/Fighter Data Link); Integrated Communications Navigation and Identification Avionics (ICNIA); ITIDS terminals including ITIDS Class 1, Class 2, Class 2M, and Class 2H; and future systems incorporating the JTIDS/lMIDS waveform implementation (e.g., the Joint Tactical Radio System). For the purposes of this agreement, all these systems will be collectively referred to as "Link-16."

SPECIFICATIONS:

1. DoT and DoD will support appropriate service allocation and station class designations for systems meeting the minimum technical/regulatory requirements as specified by the NTIA and international spectrum usage agreements. Both agencies will work cooperatively to protect civil and military systems sharing the 960-1215 MHz.

2. DoD will limit uncoordinated Link-16 operations in accordance with the spectrum restrictions outlined in the NTIA Spectrum Certification as approved by the NTIA Office of Spectrum Management (OSM). Associate Administrator. Relaxation of these restrictions in the 1030-1215 MHz band on a system-by-system, case-by-case, or other appropriate basis may be approved based on Interdepartment Radio Advisory Committee (IRAC) review of testing/documentation that concludes relaxation will not result in harmful interference to authorized users of the band. 1

3. Upon final certification approval, DoT will support a permanent United States and its Possessions (US&P) assignment for Link-16 operations within the constraints identified in the NTIA spectrum certification.

3.1. (Added) (USAFE) The following categories of equipment in the EUCOM and AFRICOM Area of Responsibility (AOR) are exempt from the spectrum certification process:

A3.1. (Added-USAFE) 1. (Added) Signal generators.

A3.1.1. **(Added-USAFE)** Bench test or antenna-testing equipment.

A3.1.2. **(Added-USAFE)** Electronic fuses that activate detonation devices.

A3.1.3. **(Added-USAFE)** Unmodified European Conformity (CE) approved Commercial off-the-shelf (COTS) Family Radio Service (FRS) transceivers.

A3.1.4. **(Added-USAFE)** Unmodified CE approved COTS low power cordless telephones.

A3.1.5. **(Added-USAFE)** Cellular telephones used to access a commercial service provider.

A3.1.6. **(Added-USAFE)** International Maritime Satellite (INMARSAT) terminals.

A3.1.7. **(Added-USAFE)** Infrared and ultraviolet systems used, among other things, to measure heat intensity and spectral signatures of various targets.

A3.1.8. **(Added-USAFE)** Lasers and other systems that operate above 3000 Gigahertz (GHz).

A3.1.9. **(Added-USAFE)** Global Positioning System receivers universally marketed for civil, industrial, private, and military applications.

A3.1.10. **(Added-USAFE)** Radio and radar control heads, bus units, and software or hardware devices that interface with transmitting and receiving equipment, but by themselves do not radiate nor receive electromagnetic energy; except wireless RF modem devices.

A3.1.11. **(Added-USAFE)** Antennas that do not radiate RF energy, unless excited from a separate transmitting source.

4. DoD will ensure that by 2020, all Link-16 terminals are capable of remapping frequencies from below 1030 MHz to the sub-band above 1030 MHz. Any Link-I6 terminal produced after July 1, 2007 will be capable of remapping. These terminals are expected to begin fielding no later than January 1, 2009. All fielded Link 16 terminals will incorporate the remapping capability by 2020. Inclusion of the remapping capability in Link-I6 terminals produced prior to July 1, 2007 (ITIDS terminals excluded) will be handled when the systems are brought in for depot maintenance and/or are scheduled for other system updates to the Link-l6 terminal. DoT and DoD will meet annually to review the progress of this effort with the goal of ensuring maximum compatibility between Link 16 and aviation systems. DoD will utilize this capability

as required within the US&P to prevent harmful interference to aviation systems approved by NTIA via a stage 4 spectrum support certification for operation in the 960-1215 MHz band and implemented below 1030 MHz. This capability will be utilized to remap the minimum number of frequencies required to preclude harmful interference based on approval by NTIA through the SPS process. DoD will not use the requirement to remap frequencies from the Link-16 “hopset” as a rationale for objecting to such aviation systems.

5. DoT will work with the NTIA and other Federal Agencies to ensure aviation systems subject to US Government regulation using frequencies above 1030 MHz (including Galileo, Global Positioning System (GPS) L52, and other systems with global availability) will be designed to satisfy their minimum performance standards in their intended electromagnetic environment, including Link-16 operations complying with conditions and restrictions reflected in the Link-16 NTIA spectrum certification or any subsequent certifications. DoT will also work with the Department of State, the Federal Communications Commission, the NTIA, and DoD to support the US Government’s efforts to ensure aviation systems not under US jurisdiction whose receivers may operate in the US&P (including Galileo and other systems with global availability) will be designed to the same standard outlined in the preceding text.

6. DoT will ensure that future aeronautical radionavigation systems, electronic aids to air navigation, or other systems subject to its jurisdiction that are to be implemented using spectrum in the 1030-1215 MHz band will be designed to satisfy their minimum performance standards in their intended electromagnetic environment, including Link-16 systems operating in conformance with the approved IRAC spectrum certification. DoT will also ensure future aeronautical radionavigation systems approved by NTIA via a stage 4 spectrum support certification for operation in the 960-1215 MHz band and implemented below 1030 MHz will take into account Link-16 operations within the constraints of the NTIA spectrum certification or any subsequent spectrum certifications on Link-16 frequencies not subject to remapping.

7. DoT will authorize operations exceeding the terms of this agreement on a case-by-case basis. DoT and DOD will develop coordination procedures to accommodate Link-16 training exercisesinvolving 51-channel operations, operations exceeding approved spectrum certification criteria, and operations involving non-US and new Link-16 terminals/platforms.

8. DoT and DoD will develop 51-channel coordination procedures regionally, taking into account the expected aviation system density and services and the DoD operating areas in that geographic location.3

9. DoT will not require compatibility between Link-l 6 and Universal Access Transceiver (UAT) receivers on military platforms. UAT transmitters may be required on military platforms.
10. Only those electromagnetic compatibility (EMC) features directly affected by the engineering change will be subject to re-certification. It is expected that the monitoring function can be accomplished by a suitable revision to the uniform frequency monitor.

11. DoT will not require new EMC testing or additional restrictions with regard to existing ARNS systems (Mode S, Air Traffic Control Radar Beacon System, Traffic Alert and Collision Avoidance System, Distance Measuring Equipment (DME)/N and DMFJP, and/or the 1090

Automatic Dependent Surveillance-Broadcast extended squitter) and RNSS systems (GPS L5 and Galileo) as a result of remapping.

12. DoT will promote the development of robust aviation systems that lend themselves to improved compatibility with 51-frequency JTIDS terminals through cooperation with RTCA Inc., industry, and DoD.

13. DoT and DoD will jointly submit to NTIA a recommended specification and methodology to facilitate the terminal EMC features certification of Link-16 systems operating in the 960-1215 MHz band, within 30 days of the signature of this MOA. Subsequent to NTIA approval of the specification and a successful demonstration of the implementation of the specification/methodology DoT will endorse DoD's certifying all future Link-16 terminals' compliance, eliminating the need for future NTIA EMC features demonstrations.

14. DoD and DoT will promote the terms of this agreement in international forums (e.g., DoD will encourage North Atlantic Treaty Organization (NATO) and other international Link-16 users to implement a similar, compatible remapping capability, and DoT will work with the International Civil Aviation Organization (lCAO) and other civil aviation organizations to ensure new systems will recognize that they face environments in some countries which include Link-16 electromagnetic environments as specified in the NTIA spectrum certification.

15. DoD and DoT win seek to implement all the terms of this agreement in good faith. If circumstances change, both DoD and DoT will work together to resolve any disputes. The failure by one Department to comply with the terms of the agreement may be a basis for the other Department to terminate the agreement.

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1 Such relaxations might include higher Time Slot Duty Factor (TSDF) (in excess of 100%) and reduced geographic areas (less than 100 nm).

2 In the event that the mitigation strategies defined in the Interagency GPS Executive Board (IGEB) "Implementation of a Third Civil GPS Signal" Final Report should prove insufficient to protect civil use of the GPS L5 signal, the option to requireremapping Link-16 carriers in the 1164-1188 MHz band in lieu of a like number of below-1030 MHz Link- 16 carriers (the total number of frequencies remapped to accommodate DoT systems shall not exceed 14) will be retained. Studies to support such an option will be developed within the Spectrum Planning Subcommittee and approved by NTIA. Conclusion of this agreement satisfies the intent of the IGEB Final Report, which states "The DoD will include a priced option in the full-rate production MIDS request for proposal (RFP) to remap up to seven selectable contiguous MIDS frequencies in the 960-1215 MHz band."

3 Intent is to ensure the entire US&P is not restricted for a projected operational environment that exists only in the vicinity of high-density air traffic areas like Los Angeles International Airport.

4 The baseline for all EMC Features monitoring methodology, periodic verification requirements, and procedures for the performance of EMC Features Demonstrations must be mutually established by DoD and FAA for all MIDS production and fol1ow-on terminals.

Attachment 4 (Added-USAFE)

FREQUENCY ASSIGNMENT REVIEW CHECKLIST

Figure A4.1. Frequency Assignment Review Checklist.

ALL PURPOSE CHECKLIST	PAGE 1 OF 1 PAGES		
TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA Frequency Assignment Review Checklist	OPR USAFE CSS/SCMF	DATE	
NO. ITEM *(Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)*	Yes	No	N/A
1. Print out copy of frequency assignment in complete Standard Frequency Action Format (SFAF)	☐	☐	☐
2. Contact user and determine if frequency is still being used.	☐	☐	☐
3. If frequency is not being used, initiate delete action and forward to USAFE Frequency Management Office (FMO).	☐	☐	☐
4. If frequency is being used, set up time with user to survey equipment	☐	☐	☐
5. During survey, as a minimum, accomplish the following:	☐	☐	☐
5.1. Take precise GPS latitude and longitude coordinates and height reading of antenna being used.	☐	☐	☐
5.2. Annotate equipment type and nomenclature being used to include applicable antenna data.	☐	☐	☐
5.3. Verify power output of transmitter.	☐	☐	☐
5.4. Verify equipment is being used for function listed on assignment.	☐	☐	☐
5.5. Review all other line items for accuracy.	☐	☐	☐
5.6. If frequency is being used for Air Traffic Control function, verify whether or not frequency should be listed in the current Flight Information Publication (FLIP) (as applicable). If frequency should be listed, but is not, advise user to submit NOTAM to have FLIP updated.	☐	☐	☐
6. Update all changes using Spectrum XXI and referencing MCEB Publication 7.	☐	☐	☐
7. Run compliance function within Spectrum XXI and make corrections as necessary.	☐	☐	☐
8. Send completed proposal, in full SFAF, to USAFE FMO.	☐	☐	☐

AF IMT 2519,19911101,V4 PREVIOUS EDITIONS ARE OBSOLETE.

Attachment 5 (Added-USAFE)

EMITTER SURVEY CHECKLIST

Figure A5.1. Emitter Survey Checklist

ALL PURPOSE CHECKLIST	PAGE 1 OF 1 PAGES
TITLE/SUBJECT/ACTIVITY/FUNCTIONAL AREA Emitter Survey Checklist	OPR USAFE CSS/SCMF DATE

NO.	ITEM *(Assign a paragraph number to each item. Draw a horizontal line between each major paragraph.)*	Yes	No	N/A
1.	Obtain updated copy of installation radio frequency inventory from USAFE FMO.	☐	☐	☐
2.	Obtain copy of all flying squadrons' local flight information publications or "smart packs" (usually maintained by STAN EVAL). This listing will have all frequencies the squadron is actually using.	☐	☐	☐
2.1.	Ensure all frequencies are listed in Spectrum XXI database for use by that squadron. If they are, proceed using Attachment 3, Frequency Assignment Review Checklist.	☐	☐	☐
2.2.	If frequency(ies) is/are not listed in Spectrum XXI, proceed to task number 7.1.	☐	☐	☐
3.	Obtain large current copy of the installation grid map from appropriate agency (usually CE squadron).	☐	☐	☐
4	Divide the installation into easily manageable sections on the map.	☐	☐	☐
5.	Personally survey the area contained in the selected grid or section. View each building, mast, pole, or any other structure with that section, looking for antenna-like structures (these include satellite dishes, yagi-arrays, long-wire, dipole, etc.)	☐	☐	☐
6.	Obtain entry into each building on which an antenna is discovered or antenna lead appears to enter. Obtain information about any RF radiating or receiving equipment connected to subject antenna.	☐	☐	☐
7.	Determine if the equipment and frequency are listed in the Spectrum XXI database for that installation. If it is, proceed using Attachment 3, Frequency Assignment Review Checklist.	☐	☐	☐
7.1.	If the equipment and/or frequency are NOT listed in the Spectrum XXI database for the installation, advise the user that they may have to cease operation of the equipment until such time as proper authority to transmit can be obtained. Follow steps 8 onwards of this checklist.	☐	☐	☐
8.	Obtain full information about discovered system using, as a minimum, the following:	☐	☐	☐
8.1.	Take precise GPS latitude and longitude coordinates and height reading of antenna being used.	☐	☐	☐
8.2.	Annotate equipment type and nomenclature being used to include applicable antenna data.	☐	☐	☐
8.3.	Time and personnel permitting, determine power output of transmitter.	☐	☐	☐
8.4.	Determine for what function the equipment is being used.	☐	☐	☐
8.5.	In conjunction with USAFE FMO, determine if discovered equipment has documented host nation spectrum supportability.	☐	☐	☐
9.	If the equipment has documented supportability, continue this checklist from step 10.	☐	☐	☐
9.1.	If discovered equipment DOES NOT have documented supportability, advise the user of this fact. Working with the user and USAFE FMO, attempt to obtain host nation spectrum supportability.	☐	☐	☐
10.	Create full SFAF frequency proposal using Spectrum XXI and referencing MCEB Publication 7.	☐	☐	☐
11.	Run compliance function within Spectrum XXI and make corrections as necessary.	☐	☐	☐
12.	Send completed proposal in full SFAF to USAFE FMO.	☐	☐	☐

AF IMT 2519, 19911101, V4 PREVIOUS EDITIONS ARE OBSOLETE.

Attachment 6 (Added)

COTS WORKSHEET FOR GERMANY EXAMPLE

Datenblatt zur Beantragung der Frequenzverfügbarkeit für am Markt verfügbare Produkte

Data Sheet for Requesting Frequency Supportability for Commercial Off-the-Shelf Equipment

1. **Antragstitel** – Request title:
2. **Name des Herstellers** – Manufacturer's name:
3. **Ort des Kaufs** – Place of purchase:

   ☐ Deutschland – Germany

   ☒ außerhalb Deutschlands – outside Germany:
4. **Anschrift des Herstellers/der Vertriebsfirma** – Address of manufacturer/distributor:

Manufacture:

Distributor:

5. **Konformitätserklärung** – Declaration of conformity:

   ja – yes ☐ nein – no ☐
6. **Frequenzzuteilung** erforderlich? – Assignment of frequencies required?:

   ja – yes ☐ nein – no ☐
7. **Kennzeichnung** – System identifier: z.B. – e.g. CE:
8. **Einbauort** – Installation:
9. **Zuständige Dienststelle** – Responsible agency:
10. **Ansprechpartner vor Ort** – Local point of contact:
11. Vorgesehener **Nutzungszeitraum** – Intended period of use:
12. **Anzahl** der Geräte... – Number of equipments:

    -- die für die Nutzung[1] vorgesehen sind – are planned for use:

    – die im gleichen elektromagnetischen Umfeld eingesetzt werden – operated in the same electromagnetic environment:
13. **Technische Eigenschaften des Senders** – Transmitter equipment characteristics:

    – Sendername – Transmitter nomenclature:

[1] inklusive Ausbildung/Übung in Deutschland – including training/exercise in Germany

- Betriebsfrequenz(en) – Operating frequency (frequencies):
- Abstimmbereich(e) – *Tuning* range(s):
- Modulationsart – Modulation type:

☐ AM ☐ FM ☐ andere – other:

Bezeichnung der Aussendung(en) (gemäß VO-Funk) – Emission designation (i.a.w. ITU):

– HF-Kanaleinteilung – HF channeling:

– Sendebandbreite – Transmission bandwidth:

– mittlere Leistung – Mean output:

Spitzenleistung – Peak output:

- Leistung regelbar – Power adjustable:

ja – yes ☐ nein – no ☐

wenn ja, von ... bis – if yes, from ... to:

- durchstimmbar – tunable: ja – yes ☐ nein – no ☐
- schrittweise – gradually: ja – yes ☐ nein – no ☐

– effektive Reichweite (in Metern) – effective range (in meters):

– Spreizspektrum – Spread Spectrum:

ja – yes ☐ nein – no ☐

– Direktsequenz-Spreizspektrum – Direct Sequence Spread Spectrum (DSSS):

ja – yes ☐ nein – no ☐

– Frequenzsprungverfahren-Spreizspektrum – Frequency Hopping Spread Spectrum:

ja – yes ☐ nein – no ☐

– andere (ist zu spezifizieren) – other (to be specified):

1. **Technische Eigenschaften des Empfängers** – Receiver equipment characteristics:

– Empfängername – Receiver nomenclature:

1. Abstimmbereich(e) – Tuning range(s):

– Bezeichnung der empfangenen Aussendung(en) (gemäß VO-Funk) – Received emission designation (i.a.w. ITU):

15. **Technische Eigenschaften der Antenne** – Antenna equipment characteristics:

– Antennenname – Antenna nomenclature:

– Frequenzbereich – Frequency range:

– Antennentyp (z.B. Dipol oder λ/4-Stab) – Antenna type (e.g. dipole or quarter-wave stub):

– Antennengewinn – Antenna gain:

– Polarisation – Polarization:

16. **Einsatz-/Verwendungszweck** – Purpose:

Art der Funkstelle – Station class:

Beschreibung von Funktion und Zweck – Description of function and purpose:

.....

stationär – fixed:	ja – yes ☐	nein – no ☐
transportabel – transportable:	ja – yes ☐	nein – no ☐
mobil – mobile:	ja – yes ☐	nein – no ☐
luftgestützt – airborne:	ja – yes ☐	nein – no ☐
seegestützt – maritime:	ja – yes ☐	nein – no ☐
bodengestützt – groundbased:	ja – yes ☐	nein – no ☐

17. **Weitere Informationen** – Additional information:

– Wird bestehendes Gerät ersetzt? Wenn ja, welches? – Will be an equipment replaced? If yes, which one?

– Wie viele Frequenzen werden pro Gerät benötigt? – How many frequencies does one equipment use?

18. **Bemerkungen** – Remarks:

.....

19. **Anlagen** – Attachments:

Kopie des Antennendiagramms – Copy of antenna pattern:

ja – yes ☐ nein – no ☐

Prinzipskizze der Funkstrecken – Line diagram:

ja – yes ☐ nein – no ☐

Kopie der Gerätebeschreibung/Begleitunterlagen – Copy of equipment description/ documentation:

ja – yes ☐ nein – no ☐

Kopie der Konformitätserklärung[2] – Copy of declaration of conformity:

ja – yes ☐ nein – no ☐

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[2] Existiert eine Schnittstellenbeschreibung (SSB), so muss die jeweilige SSB-Nummer in der Konformitätserklärung aufgeführt sein. – If an interface description (SSB) exists, then the respective SSB number must be specified in the declaration of conformity.

Kopie der Steuerradzulassung der MarED[3] – Copy of Wheelmark Certificate from MarED:

ja – yes ☐ nein – no ☐

Kopie der Bestätigung, dass das Gerät den Regularien des Satellitenbetreibers entspricht.[4] –

ja – yes ☐ nein – no ☐

Command Line 20.... Used by EUCOM to put an identifying control number on request.

Examples: First two digits = Year of submission

USAREUR 11 means year of request, followed by 00X Request control number for that Command.

USAFE 11 means year of request, followed by 00X Request control number for that Command.

NAVEUR All components will use this procedure.

The last three numbers of Command Line 20; will be assigned by EUCOM, for tracking, and control.

NOTE: Line 20. Entry should be put on reach page for tracking, control puropses..
Use top right of page for entry for ease of finding, locating records...

[3]Schiffsausrüstung gemäß der EU-Richtlinie 96/98/EG muss in der Datenbank der Marine Equipment Directive (MarED) eingetragen sein. – Ship equipment which is conforming to EU Council Directive 96/98/EC has to be registered in the Database of the Marine Equipment Directive (MarED).

[4]Zum Beispiel eine Bestätigung von INMARSAT. – For example a certificate from INMARSAT.

Attachment 7 (Added-USAFE)

EU DECLARATION OF CONFORMITY EXAMPLE

EC Declaration of Conformity

In accordance with EN ISO 17050-1:2004

We	Acme Widget Ltd
of	Unit 1, Wall Farm, Ind. Est., Walsall, W. Midlands, B1 23B

in accordance with the following Directive(s):

2006/95/EC	The Low Voltage Directive
2004/108/EC	The Electromagnetic Compatibility Directive
98/37/EC	The Machinery Directive

hereby declare that:

Equipment	Widget manufacturing machine
Model number	Super 77
Serial Number	001236

is in conformity with the applicable requirements of the following documents

Ref. No.	Title	Edition/date
BS EN 746-1	Industrial thermoprocessing equipment. Common safety requirements for industrial thermoprocessing equipment	1997
EN 60204-1	Safety of machinery. Electrical equipment of machines. General requirements	2006
BS EN 61000-6-1	Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments	2001
BS EN 61000-6-3	Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments	2001

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all applicable Essential Requirements of the Directives.

Signed:

Name:	Nigel Watkins
Position:	Technical Director
Walsall	Walsall
On	1 April 2009

CE09

Document ref. No.
1234/09D1234

EXAMPLE