

# CHAPTER 7

## Authorized Frequency Usage

### 7.1 GENERAL

1. Within the jurisdiction of the United States Government, use of the radio frequency spectrum for radio transmissions for telecommunications or for other purposes shall be made by United States Government stations only as authorized by the Assistant Secretary.

2. The frequency assignments mentioned in Section 7.2 result from the submission of applications by federal agencies (see Chapter 9). The other parts of this chapter contain authority for the use of certain frequencies under specified conditions, and the submission of applications therefore is not required. The use of any such equipment is also subject to any policy or guidance by their user agency.

#### 7.1.1 Lasers and Other Systems That Operate Above 3000 GHz

1. No authorization is required for the use of frequencies above 3000 GHz. As a matter of information, agencies may inform the IRAC of such usage, but no record of it shall be kept in the Government Master File (GMF), the list of Frequency Assignments to Government Radio Stations.

2. NTIA has the authority under the Communications Act of 1934, as amended, to license stations that operate above 3000 GHz, including lasers, but at this time does not choose to do so.

### 7.2 USE OF FREQUENCIES CONTAINED IN THE LIST OF FREQUENCY ASSIGNMENTS TO FEDERAL GOVERNMENT RADIO STATIONS

1. The frequency assignments contained in the Government Master File (GMF) may be used by federal agencies in accordance with the particulars of those assignments.

2. The complete listing of Federal Government frequency assignments, the GMF is also an important tool for spectrum management activities. Accordingly, data requirements for the particulars of frequency assignments in the GMF may be revised, updated, and expanded as needed to meet changing spectrum management requirements.

### 7.3 USE OF FREQUENCIES FOR NATIONAL SECURITY AND EMERGENCY PREPAREDNESS (NS/EP)

#### 7.3.1 Overview

Whenever possible, normal policies and procedures governing federal spectrum management contained elsewhere in this Manual should be followed. The procedures contained in this section relate to any emergency occasion, instance, or situation which requires a federal response not covered by normal spectrum management policies and procedures. Specific NTIA policies for spectrum use and management in support of a response to emergency situations include:

- Continuing, insofar as possible, use of existing frequency assignments;
- Continuing to coordinate frequency assignments through Headquarters NTIA;
- Emphasizing the need to preplan the use and management of radio spectrum before emergencies arise;
- Ensuring that all agency communications are electromagnetically compatible with other users to reduce the possibility of interference;
- Providing for federal, military, and civil, spectrum needs determined by a competent authority;
- Assuring use of the radio spectrum conforms to national priorities established by the Director of the Office of Science and Technology Policy (OSTP) as stated in the NTIA *Emergency Readiness Plan for the Use of the Radio Frequency Spectrum* (ERP), or by other competent authority;
- Providing, with minimal disruption to other services, radio spectrum resources as necessary to satisfy federal emergency response requirements; and
- Recommending adjustments to spectrum use when situations require.

### **7.3.2 Spectrum Management in Support of the National Response Framework (Non-Wartime)**

1. In the case of an emergency where FEMA activates procedures in accordance with the National Response Framework (NRF), NTIA will continue to perform its frequency management functions at its Headquarters, whether using its home office in Washington, DC or its Continuity of Operations (COOP) sites. Thus, processing of all frequency assignment requests continues to follow current published procedures. NTIA may also deploy spectrum managers to the emergency area as necessary to perform a liaison representing NTIA.

2. In the event of Department of Defense (DoD) involvement, the Defense Coordinating Officer (DCO) or Joint Task Force, will establish a Joint Spectrum Management Element (JSME) in accordance with Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3320.01B and other applicable procedures and guidelines. The JSME spectrum manager serves as the single point of contact for joint or single service task forces temporary or permanent spectrum requirements. The JSME forwards requirements through the appropriate military channels. In all instances, spectrum coordination will not be completed until the NTIA Office of Spectrum Management (OSM) Frequency Assignment Branch validates the spectrum use and authorizes a frequency assignment.

3. The deployed NTIA spectrum manager will assist agencies, as necessary, in forwarding requests to their appropriate agency headquarters or, if necessary, to NTIA for assignment action. All frequency requests must be processed through Headquarters NTIA.

### **7.3.3 Deployment of Spectrum Dependent Systems**

1. For systems with US, USA, US&P, Statewide and other similar area assignments in the GMF that have no specific coordinates, agencies shall notify NTIA that the agency intends to use the assignment in the affected emergency area. This includes all spectrum-dependent systems being deployed into the emergency area, or any existing area assignment within the emergency area that requires additional frequency authorizations.

2. Agencies should coordinate planned deployment of any emitters prior to entry into the emergency area. Upon entry into the emergency area, users will coordinate with their agency's spectrum management personnel, including any deployed personnel supporting the NRF. Any requests for frequency authorizations are to be forwarded to Headquarters NTIA for approval. Except as covered by Section 7.3.4, agencies shall, prior to operation, coordinate and receive approval by NTIA for all radio use intended for operation in the emergency area. Should an existing/incumbent system in the affected area no longer be operational, NTIA may authorize reuse of assigned frequencies or frequency allotments to support new operations. The reuse of these assigned frequencies or frequency allotments will be coordinated for use on a temporary basis or until such time as the original user is prepared to re-establish operations under the parameters of the original authorization. Should the emergency area fall within the area of responsibility of a DOD Area Frequency Coordinator (AFC) and requirements include spectrum covered under Section 8.3.26, the user will coordinate with the DCO prior to requesting authorization through NTIA.

### **7.3.4 Emergency Communications for which an Immediate Danger Exists to Human Life or Property**

1. In situations where immediate danger exists to human life or property, an agency may operate temporarily on any regularly assigned frequency in a manner other than that specified in the terms of an existing assignment. Emergency operations under such situations should continue only as long as necessary to ensure that the danger to human life or property no longer exists. Emergency operations under these circumstances shall be reevaluated on a regular basis until such time as normal/routine operations can be reestablished.

2. Interoperable communications for disaster/emergency response involving federal, state, local, and tribal entities shall be in conformance with Section 4.3.16 of this Manual. Additional information regarding interoperable communications can also be found in the National Interoperability Field Operations Guide (NIFOG) and the National Interoperability Frequency Guide (NIFG) promulgated by the Department of Homeland Security.

### **7.3.5 National Security and War Emergency Communications**

1. Upon proclamation by the President of war, threat of war, state of public peril or disaster or other national emergency, or in order to preserve the neutrality of the United States, the President may exercise war emergency

powers pursuant to 47 U.S.C. § 606. The Director, Office of Science and Technology Policy (OSTP) will execute these powers under 47 C.F.R. § 214.6. Under 47 C.F.R. § 202.1 (f), and subject to the overriding control of the Director, Office of Science and Technology Policy (OSTP) under the President's war emergency powers, NTIA will continue to authorize and assign radio frequencies until otherwise directed.

2. The Director, OSTP bears overall responsibility for the development and approval of radio spectrum priorities supporting the NS/EP telecommunications functions of the Federal Government. 47 C.F.R. § 202.3 (c)(2) & (e)(1)(i). The OSTP Memorandum for the Secretary of Commerce, National Security Emergency Preparedness Priority System for Government-Owned/Leased Spectrum-Dependent Telecommunications Systems (May 19, 1989) designated NTIA to develop this system of priorities. NTIA has accordingly developed the Telecommunication Service Priorities for Radio (TSP-R). The ERP contains procedures for agencies to designate the appropriate TSP-R for their spectrum-dependent systems.

3. The ERP contains further guidance on spectrum use during these emergencies. NTIA prepares, maintains and disseminates the ERP, and ensures that it accurately reflects the projected NS/EP spectrum usage and priority requirements of federal departments and agencies.

### **7.3.6 Emergency Use of Non-Federal Frequencies**

In emergency situations, a federal radio station may utilize any frequency authorized to a non-federal radio station, under Part 90 of the FCC Rules and Regulations, when such use is necessary for communications with the authorized non-federal stations and is directly related to the emergency at hand. Such use is subject to the following conditions:

- The non-federal licensee has given verbal or written concurrence;
- Operations are conducted in accordance with the FCC Rules and Regulations;
- Use is restricted to the service area and station authorization of the licensee;
- All operations are under the direct control of the licensee and shall be immediately terminated when directed by the licensee;
- Operations do not exceed 60 days; and,
- The federal agency shall provide, through the agency's FAS representative to the FCC as soon as practicable, a written report of each such use.

### **7.3.7 Status Reporting Procedures**

Based on circumstances of a specific event, NTIA will direct the IRAC agencies to report information relative to spectrum-dependent systems within a disaster/emergency area. Non-member agencies will report through their point of contact in the OSM Frequency Assignment Branch. IRAC members and non-member agencies will keep NTIA informed regarding any changes to that status throughout the response/recovery period so that the appropriate adjustments can be made to the national-level databases.

### **7.3.8 Coordination and Use of Emergency Networks**

1. FEMA National Emergency Coordination Net (NECN): After coordination with the FEMA program manager for FEMA National Radio System (FNARS), federal high frequency (HF) radio stations are authorized to communicate with stations operating on the NECN when necessary for coordination in relation to NS/EP response efforts including tests and exercises. NECN provides pre-designated and ad hoc frequencies to support NS/EP response efforts. These frequencies are a virtual "meeting place" where responders from different agencies can make contact to coordinate their activities, exchange operational information, and receive support (such as relay, phone patch, information lookup, and third-party message handling) from the FEMA radio operators or other stations on the net.

a. The NECN provides the following:

- (1) Communications support to federal agencies that need to contact FEMA during NS/EP response efforts;
- (2) Interoperability communications support between federal agencies and state emergency operations centers via the FEMA HF radios installed there during NS/EP response efforts;
- (3) High-power HF stations with emergency generator backup power, staffed by federal or state

employees; and,

(4) Capability for secure voice and data communications (These communications are exercised quarterly).

b. The NECN maintains a watch for expected traffic from stations directly involved in an emergency response or those stations communicating with stations directly involved in an emergency response.

c. Agencies should contact the FEMA FNARS program manager to arrange for access to the NECN:

FNARS Program Manager

DHS/FEMA MWEOC

19844 Blue Ridge Mountain Road

Mount Weather, VA 20135

Telephone: 540-542-2249

2. The Shared Resources (SHARES) High Frequency Radio Program: The IRAC, in coordination with the federal departments and agencies that made up what was formed (known as the National Communications System, established the SHARES HF Radio Program<sup>1</sup>. Federal agencies may use SHARES as a means of passing message traffic when their own networks are not available. Agencies participating in SHARES will accept SHARES traffic at their own discretion. Each agency determines if emergency message traffic (including test and exercise traffic) can be handled, and if it can, the best means of delivery, given the agency's requirements.

a. Participation in SHARES requires a common understanding and acceptance of procedures. These procedures are contained in the SHARES manual.

b. Frequency assignments made available by participating agencies for use in SHARES must have a US, USA, US&P, or area assignment in the GMF, with Record Notes S296 and S38I. Additionally, the Circuit Remarks field must contain \*NTS,M002, IRAC 24902 which defines the SHARES Radio Program concept of operation. Operations under these assignments by agencies other than the one to which the assignment is issued are limited to SHARES operations and tests. Participating agencies in SHARES are authorized to make test transmissions on a non-interference basis to the agency holding the frequency assignment.

3. Use of 5167.5 kHz in the State of Alaska: U.S. Government stations may use the frequency 5168.9 kHz (carrier reference frequency 5167.5 kHz) with maximum power of 150 watts Peak Envelope Power (PEP) for emergency communications in the State of Alaska. Airborne stations are not authorized to use this frequency. Stations operating on this frequency shall be located within the State of Alaska or within 92 kilometers of its boundaries.

4. Federal Communications with Radio Amateur Civil Emergency Service Stations: Federal radio stations are authorized to communicate with stations in the Radio Amateur Civil Emergency Service (RACES) in accordance with FCC rules covered in 47 C.F.R. § 97.407.

### **7.3.9 Use of Amateur Radio High Frequency Equipment for Emergency Communications**

Use of Amateur high frequency radio equipment meeting the standards for unwanted emissions specified in 47 CFR, Section 97.307 is permitted on SHARES or Military Auxiliary Radio System (MARS) network frequencies when authorized by the Department of Homeland Security or Department of Defense (DOD), respectively, as part of either the SHARES or MARS networks. The use of such equipment will be limited to national security or emergency preparedness events as well as DOD-sponsored MARS operations.

## **7.4 USE OF FREQUENCIES BY FIXED AND LAND STATIONS**

When it is indispensable to do so, and on the condition that the characteristics of the stations continue to conform to those in the GMF, a fixed station may, on a secondary basis, transmit on its assigned frequencies to mobile stations, and a land station may, on a secondary basis, transmit on its assigned frequencies to fixed stations or other land stations in the same category.

## **7.5 USE OF FREQUENCIES BY MOBILE STATIONS**

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<sup>1</sup> See IRAC Document 24902/1, A Concept of Operations for a Shared Resources High Frequency Network ("SHARES").

### 7.5.1 Frequencies Assigned to Federal Stations in the Mobile Service and Mobile Earth Stations

A mobile station may transmit on a frequency assigned to a federal station in the mobile service a) when directed to do so by the latter for the specific purpose of communicating with the station issuing the directive or with other stations in the same net or b) by directive from the agency operating the stations to which the frequency is assigned.

### 7.5.2 Frequencies Authorized by the FCC for Ship Stations

Frequencies authorized by the Federal Communications Commission for ship stations may be used by federal mobile stations to communicate with non-federal stations in the maritime mobile service.

### 7.5.3 Frequencies for the Safety of Life and Property

1. Aircraft, ship, survival craft and mobile earth stations may use the following frequencies provided such use is in accordance with the ITU Radio Regulations Article 5, Chapter VII and Appendix 15:

a. Frequencies designated for use by ships for radiotelephone distress and safety traffic.

2182 kHz	4125 kHz	6215 kHz	8291 kHz
12290 kHz	16420 kHz	156.8 MHz (VHF FM Channel 16)	

b. Frequencies designated for use by ships using Digital Selective Calling (DSC) for distress and safety calls.

2187.5 kHz	4207.5 kHz	6312.0 kHz	8414.5 kHz
12577.0 kHz	16804.5 kHz	156.525 MHz (VHF Channel 70)	

c. Frequencies designated for use by ships for Distress, Urgent and Safety traffic using radiotelex or narrow band direct printing (NBDP).

2174.5 kHz	4177.5 kHz	6268.0 kHz
8376.5 kHz	12520.0 kHz	16695.0 kHz

d. Frequencies designated for use by ship, aircraft and shore stations utilizing radiotelephony during coordinated search and rescue operations.

3023 kHz	5680 kHz	123.1 MHz
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e. Frequencies designated by aircraft stations in addition to their normal air/ground communications channel(s) for distress, urgent, safety and calling purposes.

121.5 MHz	243.0 MHz
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f. Frequencies designated by mobile earth stations for distress, urgent and safety communications.

1626.5-1645.5 MHz	1645.5-1646.5 MHz
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2. Ship stations may use the frequencies 156.650 and 156.375 MHz for ship-to-ship and ship-to-shore communications related to the safety of navigation in accordance with the Vessel Bridge-to-Bridge Radiotelephone Act (Public Law 92-63). (See ITU Radio Regulation Article 33 Section VI, Ap. 15, and Section 8.2.29 of this Manual.)

3. Ship, survival craft and search and rescue aircraft stations may use the frequencies 161.975 and 162.025 MHz for automatic identification system (AIS) purposes (see ITU Radio Regulation Article 5, Ap 15 and 18).

4. The provisions of this Manual do not prevent mobile stations, or mobile earth stations, in distress from using any frequency at its disposal to attract attention, make known its position, and obtain help. (See ITU Radio Regulation Article 4, RR 4.9 and Article 30, RR 30.2)

5. To enhance protection of life and property, it is mandatory that each Emergency Position Indicating Radiobeacon (EPIRB), Emergency Locating Transmitter (ELT) or Personal Locator Beacon (PLB) operating on 406.025 MHz be registered with NOAA. Agencies shall advised NOAA in writing of any change in registration information. Initial registration forms are provided by the equipment manufacturer. NOAA will provide registrants with confirmation of registration and change of registration postcards. NOAA's address is: NOAA/NESDIS, SARSAT Operations Division, E/SP3, Federal Building #4, Room 0158, Washington, DC 20233. As an alternative, agencies may make special arrangements for the registration of these devices directly with the NOAA/NESDIS SARSAT Operations Division.

#### **7.5.4 Frequencies for Coordinating Search and Rescue Operations**

1. The carrier frequencies 3023 and 5680 kHz (ITU Ap. 15, Ap. 13 Part A2, Section I, D, § 3, Ap. 13 Part A2, Section I, F, § 5, and Part II, Appendix 27) may be used by mobile stations for intercommunication between mobile stations engaged in coordinated search and rescue operations, including communication between the mobile stations and participating land stations, provided such use is in accordance with the provisions of Ap. 13 Part A2, Section I, D, § 3, Ap. 15, Ap. 13 Part A2, Section I, F, § 5, and Ap. 15 of the ITU Radio Regulations and Appendix 27. Federal mobile stations shall use J3E emission, upper sideband only, when all stations participating in a search and rescue operation are capable of using that emission. Emissions A1A, A3E or H3E may also be used if necessary.

2. The frequency 123.1 MHz, using class A3E emission, may be used by stations of the aeronautical mobile service and by other mobile and land stations engaged in coordinated search and rescue operations.

3. The frequency 156.3 MHz may be used for communications between ship stations and aircraft stations, using G3E emission, engaged in coordinated search and rescue (SAR) operations. When control of the scene of a SAR incident is under a Coast Guard coast station, 156.3 MHz may be used by ship stations to communicate with that coast station.

#### **7.5.5 Coast Station Frequencies**

A mobile station may transmit on the same frequency as the coast station with which it is communicating, provided that a) the emission satisfies the frequency tolerance applicable to the coast station, b) the coast station requests the transmission, and c) no harmful interference is caused to other stations.

#### **7.5.6 Frequencies for Marine Environmental Protection Operations**

The frequency 157.075 MHz, 16K0F3E emission, may be used by mobile stations, and for portable-type operations, for communications required to coordinate marine environmental protection operations, e.g., communications pursuant to the Joint Canada-United States Marine Contingency Plan for Spills of Oil and Other Noxious Substances. All use of this frequency under this authority shall be in accordance with plans formulated by competent environment-protection authorities and shall be under the operational control of the designated on-scene commander/coordinator or deputy on-scene commander/coordinator.

#### **7.5.7 Ship Station Frequencies in the Bands 4000-4063 and 8100-8195 kHz**

Ship stations may transmit (emission: 2K80J3E), with power not exceeding 1.5 kW PEP, on frequencies designated for radiotelephony in the channeling plans of Section 4.3.13 for intership and ship-shore radiotelephony communications, provided no harmful interference is caused to other authorized users.

## **7.5.8 Federal Government Use of the Family Radio Service (FRS)**

Federal Government entities are authorized to purchase and operate radios certified by the FCC in the Family Radio Service (FRS), pursuant to Part 95 Subpart B of the FCC Rules and Regulations (Title 47, Code of Federal Regulations). Federal users will be accorded the same privileges as non-federal users. Because FRS users must share each channel and no user is assured protection from interference caused by another authorized user, federal entities may not purchase and operate FRS radios for planned communications operations that safeguard human life or property.

## **7.5.9 Federal Use of Medical Telemetry Devices in Certain Bands**

1. Federal agencies may, without further authority from the Assistant Secretary, purchase and operate devices certified by the FCC in the Medical Device Radiocommunication Service (MedRadio), pursuant to 47 CFR Part 95 Subpart I. MedRadio is allocated in the 401-406 MHz band under footnote US64 on the condition that harmful interference is not caused to stations in the meteorological aids, meteorological-satellite, and Earth exploration-satellite services, and that MedRadio stations accept interference from stations in the meteorological aids, meteorological-satellite, and Earth exploration-satellite services. Subject to the foregoing, federal users have the same rights and obligations as non-federal users.

2. Federal agencies may, without further authority from the Assistant Secretary, purchase and operate devices certified by the FCC in the Wireless Medical Telemetry Service (WMTS), pursuant to 47 CFR Part 95 Subpart H. WMTS is allocated in the 608-614 MHz, 1395-1400 MHz, and 1427-1429.5 MHz bands. Subject to the foregoing, federal users have the same rights and obligations as non-federal users, e.g., 47 CFR 95.1111 which requires registration of all devices with a designated frequency coordinator.

## **7.6 USE OF FREQUENCIES BY AIRCRAFT STATIONS**

1. Aircraft stations of any federal agency may use any aeronautical mobile (R) band frequency below 30 MHz for communication only with aeronautical stations regularly serving the routes or areas to which those frequencies are specifically allotted by international agreement. Further, any high frequency authorized by the Federal Communications Commission for aircraft stations may be employed by aircraft stations of any federal agency when communicating for safety purposes with aeronautical stations to which such frequencies are assigned, after arrangements have been made with the licensee of the non-federal aeronautical stations for this use.

2. Since military aircraft will use UHF in lieu of VHF to the maximum extent practicable, aircraft stations of any federal agency may use any frequency in the bands 117.975-123.0875, 123.5875-128.8125, and 132.0125-137.000 MHz for air traffic control, ground control, aeronautical advisory, aeronautical multicom, and flight service communication, as appropriate, only with aeronautical stations regularly serving the routes or areas to which those frequencies are authorized specifically. All operations by federal aircraft stations under the provisions of this paragraph shall be restricted to the purpose for which the particular frequency is allotted and authorized to the federal or non-federal aeronautical station.

3. All operations by federal aircraft stations under the provisions of the two preceding paragraphs shall comply with the appropriate provisions of Part 87 of the FCC Rules. Such provisions include, but are not limited to, those pertaining to power, type of emission, scope of service, permissible communications, and frequencies available, noting that the FCC does not issue type acceptance for equipment used aboard federal-owned and operated aircraft.

4. The frequency 122.925 MHz may be used with 6K00A3E emission by aircraft when coordinating natural resources programs of federal or state natural resources agencies, including forestry management and fire suppression, fish and game management and protection, and environmental monitoring and protection.

5. Radionavigation mobile stations aboard aircraft of any federal agency may utilize frequencies in the 1025-1150 MHz band to operate with directly associated ground-based facilities in TACAN/DME and ACRB systems, and frequencies in the 4200-4400 MHz band to operate radio altimeters.

## **7.7 USE OF FREQUENCIES BY MANNED SPACECRAFT**

1. Stations aboard manned spacecraft may use the emergency, distress, survival craft, and search and rescue frequencies (2182 kHz, 3023 kHz, 5680 kHz, 8364 kHz, 121.5 MHz, 156.8 MHz and 243 MHz) of the aeronautical mobile and maritime mobile services for these purposes under the same rules and restrictions

applicable to those services.

2. Article V of the United Nations Treaty on principles governing the activities of States in the exploration and use of outer space, including the Moon and other celestial bodies, provides that, “In carrying on activities in outer space and on celestial bodies, the astronauts of one State Party shall render all possible assistance to the astronauts of other State Parties”. In furtherance of this obligation, Recommendation ITU-R SA.1863 has been adopted by the ITU. This Recommendation states that:

a. A manned spacecraft experiencing an emergency situation should use the 2290-2300 MHz band, excluding the 2293-2297 MHz sub band, to transmit to the Earth, directly and/or through a data relay satellite (DRS).

b. Transmissions to a manned spacecraft experiencing an emergency situation, either directly or through a DRS, should use the band 2025-2110 MHz or 2110-2120 MHz or both bands.

c. Unwanted emissions in the 2293-2297 MHz band from manned spacecraft emergency transmitters should meet the applicable deep space protection criteria stated in Recommendation ITU-R SA.1157.

## **7.8 PURCHASE AND USE OF NON-LICENSED DEVICES**

1. Federal Government agencies may, without further authority from the Assistant Secretary, purchase “off-the-shelf” non-licensed devices that conform to the applicable edition of Part 15 of the Federal Communication Commission's (FCC) Rules and Regulations (47 CFR, Part 15) or non-licensed devices for which the FCC has granted a waiver of specific requirements of Part 15. NTIA maintains the authority to forbid the operation of specific non-licensed devices for which the FCC has granted a waiver of Part 15 if NTIA deems the waiver to be inappropriate for the Federal Government. NTIA will identify in this section any such cases. The authorization stated in this section in no way abrogates the authority of any federal agency to forbid the operation of any non-licensed device by any user under its authority.

Non-licensed devices subject to FCC certification, notification or verification shall bear the appropriate FCC statement of limitations to operations. Agencies purchasing or using non-licensed devices for which the FCC has granted a waiver of specific requirements of Part 15, shall operate these devices in such a way as meet all the conditions of the waiver.

2. The agency operating a non-licensed device that causes interference to an authorized radio station shall promptly take steps to eliminate the interference. Upon notification by cognizant spectrum management personnel that the device is causing interference, the operator of the non-licensed device shall cease all radiations from the device. Operations shall not resume until the condition causing the interference has been corrected.

3. Agencies operating a purchased non-licensed device have no vested or recognized right to continued use of the device in any part of the radio frequency spectrum. Non-licensed device operations must accept any interference from any federal or non-federal authorized radio station, other non-licensed device, or industrial, scientific and medical (ISM) equipment.

4. Non-licensed devices, since they operate on a non-interference basis, may not provide sufficient reliability for critical radio communications functions affecting human life or property. Non-licensed devices, however, may provide valuable and unique supplemental or expendable radio communications services where needed. To ensure adequate regulatory protection, federal entities should rely only on devices with frequency assignments in the Government Master File as principal radiocommunication systems for safeguarding human life or property.

## **7.9 DEVELOPMENT AND USE OF NON-LICENSED DEVICES**

1. Annex K is based on Part 15 of the FCC's Rules and Regulations (47 CFR, Part 15) which governs non-federal use of radio frequency devices that do not require an individual license to operate (i.e., “non-licensed devices”). Federal Government telecommunication operations do not require an FCC license or authorization. The term “non-licensed device” used in this Part refers only to federal devices - and operations of such devices - that conform to the technical criteria in Annex K.

2. Agencies may develop and operate devices that conform to the technical criteria in Annex K without further authority from the Assistant Secretary. Additionally, any operational capability that conforms to the technical criteria in Annex K may be incorporated into otherwise authorized telecommunication systems without further authority from the Assistant Secretary.

3. The agency operating a device developed under the technical criteria of Annex K that causes interference to any authorized station shall promptly take steps to eliminate the interference. Upon notification by cognizant

spectrum management personnel that the device is causing interference, the operator of the non-licensed device shall cease all radiations from the device. Operation shall not resume until the condition causing the interference has been corrected.

4. Agencies operating a device developed under the technical criteria of Annex K, have no vested or recognized right to continued use of the device in any part of the radio frequency spectrum. These devices must accept any interference from any authorized federal or non-federal radio system, other non-licensed device, or industrial, scientific, or medical (ISM) equipment.

5. Non-licensed devices, since they operate on a non-interference basis, may not provide sufficient reliability for critical radio communications functions affecting human life or property. Non-licensed devices, however may provide valuable and unique supplemental or expendable radio communications services where needed. To ensure adequate regulatory protection, federal entities should rely only on devices with frequency assignments in the Government Master File as principal radiocommunication systems for safeguarding human life or property.

## **7.10 USE OF FREQUENCIES BY INDUSTRIAL, SCIENTIFIC, AND MEDICAL (ISM) EQUIPMENT**

Without further authority from the Assistant Secretary, ISM equipment may be operated under the conditions specified in this part for particular categories of equipment or types of operations.

### **7.10.1 Operation on Particular Frequencies Designated for ISM Equipment**

1. The following frequencies are designated for use by ISM equipment, the emissions of which shall be confined within the frequency limits associated with each frequency:

6780 kHz	± 15.0 kHz	5800 MHz	± 75.0 MHz
13560 kHz	± 17.0 kHz	24.125 GHz	± 125.0 MHz
27120 kHz	± 163.0 kHz	61.25 GHz	± 250.0 MHz
40.68 MHz	± 20.0 kHz	122.5 GHz	± 500.0 MHz
915 MHz	± 13.0 MHz	245 GHz	± 1.0 GHz
2450 MHz	± 50.0 MHz		

2. In the event harmful interference is caused by ISM operation to any authorized radio service outside the frequency limits specified, the operator of the ISM equipment shall promptly take necessary steps to eliminate such interference, except in those cases where the interference is due to direct intermediate frequency pickup by a receiver of the fundamental frequency emissions of ISM equipment operating on an ISM frequency, and the operator otherwise complies with this section.

3. ISM equipment, other than industrial heating equipment, that is operated on the frequencies 915, 2450, 5800 MHz, and 24.125 GHz, is subject to the following conditions:

a. The energy radiated and the bandwidth of emission shall be reduced to the maximum extent practicable.

b. In the event harmful interference is caused to authorized radio services from spurious or harmonic radiation from ISM equipment, the operation of the ISM equipment shall be discontinued until necessary measures have been taken to eliminate such interference.

4. Medical diathermy equipment may be operated on the designated ISM frequencies without regard to the type or power of emissions being radiated, except as specified above. However, any harmonic or other spurious radiation outside the frequency limits specified in this section shall be suppressed so as not to exceed a strength of 25  $\mu\text{V}/\text{m}$  at a distance of 300 meters. Measurements to determine field intensity shall be made in accordance with standard engineering procedures.

5. Industrial heating equipment and RF stabilized arc welders may be operated with unlimited radiation on any designated ISM frequency, but shall be adjusted to operate as close to that ISM frequency as practicable. Filtering between the industrial heating equipment and power lines must be provided to the extent necessary to prevent the radiation of energy from power lines on frequencies other than those designated for ISM, with a field strength in excess of 10  $\mu\text{V}/\text{m}$  at a distance of 1600 meters from the industrial heating equipment, and at a distance of 15 meters from the power line.

6. Miscellaneous ISM equipment may be operated on the designated ISM frequencies without regard to the

type or power of emissions being radiated, provided any harmonic or other spurious radiation outside the frequency limits specified in this section is suppressed so as to not exceed:

25 uV/m at a distance of 300 meters or,

for equipment generating more than 500 watts of RF power on the fundamental frequency, 25 uV/m times the square root of P/500 (where P is the actual RF power generated), but not to exceed 10 uV/m at 1600 meters, provided this increase is not permitted for equipment located in a predominantly residential area and operating on a frequency below 1000 MHz.

## 7.10.2 Operation on Frequencies Other than Those Designated for ISM Equipment

1. Operation of ISM equipment within the following safety, search and rescue frequency bands is prohibited: 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.

2. In the event harmful interference is caused to any authorized radio service outside the frequency limits specified in Section 7.10.1, by ISM operation conducted pursuant to this section, the operator of the ISM equipment shall promptly take the necessary steps to eliminate the interference.

3. Medical diathermy equipment shall be provided with a rectified and filtered plate power supply, powerline filters, and shall be constructed so that any radiated radio frequency energy (including harmonic or other spurious emissions) on a frequency outside the frequency limits specified in Section 7.10.1 does not exceed a strength of 15  $\mu$ V/m at a distance of 300 meters. Measurements to determine field intensity shall be made in accordance with standard engineering procedures.

4. Industrial heating equipment and RF stabilized arc welders may be operated provided all of the following conditions are met:

a. Radiation on the fundamental carrier frequency, as well as spurious and harmonic radiations resulting from any source frequency, and falling outside the frequency limits specified in Section 7.10.1, shall be suppressed so that:

(1) below 5725 MHz the field strength does not exceed 10  $\mu$ V/m at a distance of 1600 meters and;

(2) above 5725 MHz it is reduced to the greatest extent practicable.

b. Filtering between the industrial heating equipment and power lines shall be provided to the extent necessary to prevent the radiation of energy from power lines on frequencies other than the designated ISM frequencies, with a field strength in excess of 10  $\mu$ V/m at a distance of 1600 meters from the industrial heating equipment and at a distance of 15 meters from the power line.

5. Miscellaneous ISM equipment may be operated on frequencies other than those designated for ISM equipment provided all of the following conditions are met:

a. The equipment shall be provided with a rectified and filtered plate power supply and power line filters.

b. Any radiated radio frequency energy outside the frequency limits specified in Section 7.10.1 (including harmonic or other spurious emissions) shall not exceed:

15  $\mu$ V/m at a distance of 300 meters; or,

for equipment generating more than 500 watts of RF power on the fundamental frequency, 15 uV/m times the square root of P/500 (where P is the actual RF power generated), but not to exceed 10  $\mu$ V/m at 1600 meters, provided this increase is not permitted for equipment located in a predominantly residential area and operating on a frequency below 1000 MHz.

6. Operation of ultrasonic equipment shall not result in radiation exceeding the following limits:

a. Below 490 kHz

2400  $\mu$ V/m at 300 meters/Frequency (in kHz)

Between 490 and 1600 kHz

24000  $\mu$ V/m at 30 meters/Frequency (in kHz)

Over 1600 kHz (excluding frequencies within the limits specified in Section 7.10.1)

15  $\mu$ V/m at 30 meters

b. For equipment operating below 490 kHz and generating more than 500 watts of RF power on the fundamental frequency.

2400  $\mu$ V/m at 300 meters "Frequency (in kHz) times the square root of P/500 (where P is the actual RF power generated), but not to exceed 10  $\mu$ V/m at 1600 meters", provided this increase is not permitted for equipment located in a predominantly residential area.

c. On any frequency 490 kHz and above, the radio frequency voltage appearing on each power line shall not exceed 200  $\mu$ V; below 490 kHz it shall not exceed 1000  $\mu$ V.

## 7.11 USE OF FREQUENCIES BY CERTAIN EXPERIMENTAL STATIONS

1. Except as provided in the following paragraph, federal experimental radio stations at the locations listed below are authorized to use any radio frequency for short or intermittent periods without prior authorization of specific frequencies provided that a) such operations are confined to the immediate vicinity of the station; b) the nature or duration of the requirement is such that the assignment of specific frequencies is impracticable; and c) all reasonable measures are taken before such frequencies are used to ensure that harmful interference will not be caused to authorized services, and, in this regard, consideration should be given to the propagation characteristics of the frequency to be utilized and to the operational nature of the services normally operating on frequencies of the order of that selected.

2. This authority is limited to radio frequency usage which is an integral part of an experimental operation and shall not be construed as authorizing frequency usage for administrative or operational use related thereto. No priority rights shall derive from the use of a specific frequency for an operation conducted pursuant to this authority nor shall any specific frequency usage constitute a bar to the authorization of other uses. The following frequency bands are specifically excluded from this authority:

<b>kHz</b>	<b>MHz</b>	<b>GHz</b>
495.0-510.0	73.0-74.8	10.68-10.70
2173.5-2190.5	121.4-121.6	15.35-15.40
8354.0-8374.0	156.7-156.9	23.60-24.00
21850.0-21870.0	242.8-243.2	31.20-31.50
	1400.0-1427.0	58.20-59.00
	1559.0-1610.0	64.00-65.00
	2690.0-2700.0	86.00-92.00
	4990.0-5000.0	101.00-102.00
		130.00-140.00
		182.00-185.00
		230.00-240.00

(This restriction shall not be construed as precluding the measurement of antenna characteristics in these bands. In such cases, however, the power delivered to the antenna under test shall be for the sole purpose of carrying out the desired measurements and shall be no greater than is required by the measurement technique being utilized.)

3. Experimental operations conducted pursuant to this authority shall be terminated immediately upon receipt of notice that harmful interference is being caused to an authorized service. To that end, the following listings of the experimental stations include sufficient information to permit the prompt delivery at all times of notices of harmful interference.

### **Air Force, Department of the**

Space and Missile Systems Center  
SMC/EAB  
483 N. Aviation Blvd.  
El Segundo, CA 90245-2808  
Telephone: 310-653-1428, DSN: 633-1428

Air Force Flight Test Center  
650 ABW/SCT  
Building 3940, Room 153  
35 N Wolfe Avenue  
Edwards AFB, CA 93524-1110  
Telephone: 805-277-2390, DSN: 527-2390

Eastern Area Frequency Coordinator (EAFC)  
45 CS/SCMMP  
1225 Pershing Street

Patrick AFB, FL 32925-3340  
Telephone: 407-494-5837/5838  
DSN: 854-5837/5838  
Fax: 407-494-5555, DSN: 854-5555

DOD Gulf Area Frequency Coordinator  
96 CG/SCXF  
201 W. Eglin Blvd., Ste 256  
Eglin AFB, FL 32542-6829  
Telephone: 850-883-7535, DSN: 875-7535  
Fax: 850-882-3523, DSN: 872-3523

6585 Test Group  
Frequency Manager (DC)  
Holloman AFB, NM 88330-5000  
Telephone: 505-479-1375, DSN: 867-1375

Air Force Research Laboratory/Phillips  
Research Site  
3550 Aberdeen Avenue, S.E.  
Kirtland AFB, NM 87117-5776  
Telephone: 505-853-4313. DSN: 246-4313

Aeronautical Systems Center (AFMC)  
RF Spectrum Management Branch  
88th Communications Group/SCCF  
2960 K Street, Bldg. 47, Area B  
Wright-Patterson AFB, OH 45433-7661  
Telephone: 937-255-2181, DSN: 785-2181

Electronics Systems Center (AFMC)  
66SPTG/SCXC  
50 Griffiss Street  
Hanscom AFB, MA 01731-1621  
Telephone: 617-377-7511, DSN: 478-7511

Area Frequency Coordinator  
99CS/SCOTS  
5870 Devlin Drive  
Nellis AFB, NV 89191-7075  
Telephone: 702-652-3417, DSN: 682-3417

Rome Laboratory  
525 Brooks Road  
Griffiss AFB, NY 13441-4505  
Telephone: 315-330-2243, DSN: 587-2243

Geophysics Directorate of Phillips Laboratory  
ESC/SCXM  
50 Griffiss Street  
Hanscom AFB, MA 01731-1621  
Telephone: 617-377-7511, DSN: 478-7511

Western Space & Missile Center  
Frequency Manager (SFDS)  
Vandenberg AFB, CA 93437-6021  
Telephone: 805-866-6695, DSN: 276-6695

Armstrong Laboratory  
648 C-CSS/SCR  
Brooks AFB, TX 78235-6346  
Telephone: 512-536-4765, DSN: 240-4765

Arnold Engineering Development Center  
AEDC/SCX  
100 Kindell Drive, Suite B111  
Arnold AFB, TN 37389-2111  
Telephone: 615-454-5978, DSN: 340-5978

Air Force Civil Engineering Center  
Frequency Manager (LG)  
Tyndall AFB, FL 32401-6001

Telephone: 904-283-6406, DSN: 970-6406

Pacific Alaska Range Complex (PARC)  
Joint Frequency Management Office Alaska  
HQ Alaskan Command, J64  
Elmendorf AFB, AK 99506-2001  
Telephone: 907-552-8223  
Fax: 907-552-6965

### **Army, Department of the**

Commander  
Aberdeen Proving Ground  
ATTN: ASNC-TAB  
Aberdeen, MD 21005-5055  
Telephone: 301-278-4696 or 2211  
DSN: 870-4696 or 2211

Area Frequency Coordinator  
ATTN: SFIS-FAC-SH  
Fort Huachuca, AZ 85613-6000  
Telephone: 602-538-6423, or 6424  
DSN: 879-6423 or 6424

Commander  
U.S. Army Communications-Electronics  
Command  
ATTN: AMSEL-RD-ST-WL-AA  
Fort Monmouth, NJ 07703-5203  
Telephone: 732-427-2415, DSN: 987-2415

Picatinny Arsenal  
ATTN: ASNC-APT  
Dover, NJ 07801-5001  
Telephone: 201-328-4001, DSN: 880-4001

Commander  
Army Aviation and Missile Command  
ATTN: AMSAM-RD-MG-GA  
Redstone Arsenal, AL 35898-5253  
Telephone: 205-876-1688, DSN: 746-1688

Area Frequency Coordinator  
ATTN: SFIS-FAC-SS  
White Sands Missile Range,  
NM 88002-5526  
Telephone: 505-678-3702 or 5417  
DSN: 258-5417

Harry Diamond Laboratories  
Communications-Electronics Office  
2800 Powder Mill Road  
Adelphi, MD 20783-1197  
Telephone: 202-394-1804, DSN: 290-1804

Army Test and Evaluation Center  
TEDT-YPY-RO  
301 C Street  
Yuma Proving Ground  
Yuma, AZ 85365-9498  
Telephone: 928-328-3333, DSN: 899-3333  
[YPGRangeOperations@conus.army.mil](mailto:YPGRangeOperations@conus.army.mil)

Pueblo of Laguna Army RF Test Area  
Attn: Area Frequency Coordinator  
White Sands Missile Range  
New Mexico 88002-5526  
Telephone 505-678-3702 or 5417  
DSN 258-5427

Commander  
Fort Dix, New Jersey Test Area  
ATTN: AFMO US&P  
Ft. Sam Houston, TX 78234-5032  
Telephone: 210-221-2050 or 2820  
DSN: 471-2050 or 2820

### **Coast Guard**

Coast Guard Research and Development Center  
1 Chelsea Street  
New London, CT 06320  
Telephone: 860-271-2600

Coast Guard Academy  
Department of Engineering  
New London, CT 06320  
Telephone: 203-444-8546

Electronics Engineering Center  
Wildwood, NJ 08260  
Telephone: 609-522-7781  
Field Testing and Development Center  
Coast Guard Yard  
Curtis Bay, MD 21226  
Telephone: 301-789-1600

Coast Guard Telecommunications and  
Information Systems Command  
Alexandria, VA 22315  
Telephone: 703-313-5700 (Duty Hours)  
703-313-5400 (Off-Duty Hours)

### **Commerce, Department of**

NIST; NOAA/ESRL/NGDC/NWS; NTIA/ITS  
Boulder Laboratories and Associated Field Activities  
325 Broadway, ITS.E  
Boulder, CO 80305  
Telephone: 303-497-4619

Fax: 303-497-6982  
[frequencymanager@its.bldrdoc.gov](mailto:frequencymanager@its.bldrdoc.gov)

NOAA/ERL  
Boulder Atmospheric Observatory  
c/o Department of Commerce  
325 Broadway  
Boulder, CO 80303  
Telephone: 303-497-6816, FTS: 320-6816

NOAA/ERL  
Fritz Peak  
Route 4, Box 500  
Golden, CO 80401  
Telephone: 303-497-3436, FTS: 320-3436

NIST  
Radio Stations WWV, WWVB, and WWVL  
2000 East County Road 58  
Fort Collins, CO 80521  
Telephone: 303-444-3507 or 303-497-3914  
FTS: 323-5228 or 320-3914

NBS/NML  
Radio Station WWVH  
P.O. Box 417, Kekaha  
Kauai, HI 96572  
Telephone: 808-335-4361/4362

NOAA/NWS  
Sterling Research and Development Center  
Sterling, VA 22170  
Telephone: 703-471-5302

### **Energy, Department of**

Los Alamos National Laboratory  
Los Alamos, NM 87115  
Telephone: 702-295-4766 or  
702-734-3343 (nights and holidays)

Lawrence Livermore National Laboratory  
Livermore, CA 94551  
Telephone: 702-295-4766 or  
702-734-3343 (nights and holidays)

Sandia National Laboratory  
Livermore, CA 94551  
Telephone: 702-295-4766 or  
702-734-3343 (nights and holidays)

Nevada Test Site  
Mercury, NV 89023  
Telephone: 702-295-4766 or  
702-734-3343 (nights and holidays)

Frequency Coordinator  
U.S. Department of Energy  
Nevada Operations Office  
Las Vegas, NV 89114  
Telephone: 702-295-4766 or  
702-734-3343 (nights and holidays)

Sandia National Laboratory  
Albuquerque, NM 87115  
Telephone: 505-845-8028

Idaho National Engineering and Environmental  
Laboratory  
Idaho Falls, ID 83402  
Telephone: 208-526-0600 or  
208-526-1515 (nights and holidays)

### **Federal Aviation Administration**

Technical Center  
Atlantic City, NJ 08405  
Telephone: 609-484-5509

Aeronautical Center  
Spectrum Management Officer, AML-500  
Mike Monroney Center  
6500 South MacArthur  
Oklahoma City, OK 73125  
Telephone: 405-954-7922

### **Federal Communications Commission**

Equipment Development Group  
Enforcement Bureau  
3600 Hiram-Lithia Springs Rd.  
Hiram, GA 30141-6370  
Telephone: 770-222-4220

Laboratory Division  
Office of Engineering and Technology  
7435 Oakland Mills Road  
Columbia, MD 21046  
Telephone: 301-362-3000

### **Health and Human Services**

Department of National Institute of Health  
Bethesda, MD 20892  
Telephone: 496-4328 (Day) 496-5685 (24 Hr.)

Power Source Laboratory  
Division of Electronic Products  
Bureau of Radiological Health  
12720 Twinbrook Parkway

Rockville, MD 20852  
Telephone: 301-443-3840

### **Justice, Department of**

Engineering Research Facility  
Building 27958A  
Quantico, VA 22135  
Attention: Radio Engineering Unit  
Telephone: 703-632-6701  
Fax: 703-632-6694

DEA Office of Investigation Technology  
10555 Furnace Road  
Lorton, VA 22079  
Telephone: 703-495-6636  
Fax: 703-695-6542

### **National Aeronautics and Space Administration**

Ames Research Center  
MS IO 233-17  
Moffett Field, CA 94035-1000  
Telephone: 650-604-1415

Goddard Space Flight Center  
8800 Greenbelt Road, Code 450  
Greenbelt, MD, 20771  
Telephone: 301-286-5089

Johnson Space Center  
Code EV1  
Houston, TX 77058  
Telephone: 281-483-0124

Langley Research Center  
MS 466  
Hampton, VA 23681  
Telephone: 757-864-3817

Marshall Space Flight Center  
Mail Stop IS70  
Marshall Space Flight Center, AL 35812  
Telephone: 256-544-3578

Stennis Space Center  
Code RA20  
Stennis Space Center  
MS 39259-6000  
Telephone: 228-688-3964

Armstrong Flight Research Center  
MS 2516  
P.O. Box 273  
Edwards, CA 93523

Telephone: 661-276-2138

NASA/JPL Goldstone Deep Space Comm. Complex  
93 Goldstone Rd.  
Ft. Irwin, CA 92310-5097  
Telephone: 760-255-8218

Jet Propulsion Laboratory  
MS 126-260  
4800 Oak Grove Dr.  
Pasadena, CA 91109  
Telephone: 818-354-0068

Kennedy Space Center  
IT-D1  
Kennedy Space Center, FL 32899  
Telephone: 321-867-2520

Glenn Research Center  
MS 54-4  
21000 Brookpark Rd.  
Cleveland, OH 44135  
Telephone: 216-433-3457

Wallops Flight Facility  
Code 569  
Wallops Island, VA 23337  
Telephone: 757-824-1623

White Sands Test Facility  
P.O. Box 20  
Las Cruces, NM 88004  
Telephone: 505-524-5190

### **National Security Agency**

Spectrum Manager  
9800 Savage Road  
Suite 6548  
Ft. George G. Meade, MD 20755-6548  
Telephone: 301-688-6453  
Fax: 301-688-0033

### **National Science Foundation**

Frequency Coordinator  
National Optical Astronomy Observatories  
P.O. Box 26732  
950 North Cherry Avenue  
Tucson, AZ 85726  
Telephone: 602-327-5511

Frequency Coordinator  
National Astronomy and Ionosphere Center  
Arecibo Observatory Box 995

Arecibo, Puerto Rico 00612  
Telephone: 809-878-2612

Frequency Coordinator  
National Center for Atmospheric Research  
P.O. Box 3000  
Boulder, CO 80307  
Telephone: 303-497-2020

Frequency Coordinator  
National Radio Astronomy Observatory  
Very Large Array (VLA)  
P.O. Box 0  
Socorro, NM 87801  
Telephone: 505-772-4240

Frequency Coordinator  
National Radio Astronomy Observatory  
P.O. Box 2  
Green Bank, WV 22944  
Telephone: 304-456-2011

### **Navy, Department of the**

Naval Weapons Center Station China Lake  
130 Easy Road, M/S 3008  
China Lake, CA 93555  
Telephone: 760-939-6827  
Fax 939-0384, DSN: 437-6827

Naval Surface Warfare Center  
Dahlgren Division  
Coastal Systems Station  
Panama City, Florida 31407-5000  
Telephone: 904-234-4625, DSN: 436-4625

Naval Surface Weapons Center  
Dahlgren, VA 22448  
Telephone: 703-663-8531, Ext. 427, 573 or 975  
IDS Code 1232-8531, DSN: 249-8311

Naval Underwater Systems Center  
New London, CT 06320  
Telephone: 203-442-0771  
DSN: 636-0111

Pacific Missile Range Facility  
Hawaiian Area  
Kekaha, Kauai, HI 96752  
Telephone: 808-471-6231  
DSN: 315-471-6231

Pacific Missile Test Center  
Point Mugu, CA 93042  
Telephone: 805-982-7983, DSN: 351-7983

Naval Air Development Center  
Warminster, PA 18974  
Telephone: 215-441-2259, DSN: 441-2259

Commander  
Code 5.1.4A, Bldg. 1406  
Naval Air Warfare Center Aircraft Division  
23029 Cedar Point Road, Unit 4  
Patuxent River, MD 20670-1183  
Telephone: 301-342-1194 or 1532  
FAX/STU III: ext. 1200,  
ASPECTS BBS: ext. 1195  
DSN: 326-1194 or 1532

Naval Research Laboratory  
Chesapeake Bay Detachment  
Chesapeake Beach, MD 20732  
Telephone: 301-257-4000 or 257-4055

Naval Ocean Systems Center  
San Diego, CA 92152  
Telephone: 714-225-6011, Ext. 527  
DSN: 933-1011

Naval Research Laboratory  
Washington, DC 20390  
Telephone: 202-767-3200  
IDS Code 197-3200, DSN: 297-3200

Naval Electronic Systems Engineering  
Activity (NESEA)  
St. Inigoes, MD 20684  
Telephone: 301-862-8400  
DSN: 356-3512, FTS 923-8400

Midway Research Center  
P.O. Box 727  
Stafford, VA 22555  
Telephone: 703-690-1844  
Fax: 703-221-3317

Naval Surface Warfare Center  
Carderock Division  
9500 MacArthur Blvd  
West Bethesda, MD 20817  
Telephone: 301-227-1515

Naval Surface Warfare Center  
Ship Systems Engineering Station  
Carderock Division  
Philadelphia Naval Business Center  
5001 South Broad St.  
Philadelphia, PA 19112-1403  
Telephone: 215-897-7005

Naval Surface Warfare Center  
Carderock Division  
Acoustic Research Detachment  
33964 N. Main Avenue  
Bayview, ID 83803-9750  
Telephone: 208-683-2321

Naval Surface Warfare Center  
South Florida Testing Facility  
Carderock Division  
91 North Beach Rd.  
Dania Beach, FL 33004-3035  
Telephone: 954-926-4000

Naval Surface Warfare Center  
Carderock Division  
Southeast Alaska Acoustic  
Measurement Facility  
1 Back Island  
Ketchikan, AK 99901-5637  
Telephone: 907-247-6289

### **Transportation, Department of**

Transportation Systems Center  
Kendall Square  
Cambridge, MA 02142  
Telephone: 617-494-2424

Transportation Test Center  
Pueblo, CO 81001  
Telephone: 303-326-9218

## **7.12 USE OF FREQUENCIES AUTHORIZED TO NON-FEDERAL STATIONS UNDER PART 90 OF THE FCC RULES**

1. A federal radio station may utilize any frequency authorized to a non-federal radio station under 47 CFR, Part 90 of the rules of the Federal Communications Commission (FCC) where such utilization is necessary for intercommunication with non-federal stations or required for coordination with non-federal activities, provided that a) the frequency is associated with a non-Federal National Interoperability Channel and the federal entity controlling the station has received approval from the FCC licensee involved, or b) in the cases of frequencies other than the non-Federal National Interoperability Channels, a mutually approved arrangement has been concluded between the federal agency concerned, the FCC, and the non-federal licensee involved. All operations by federal stations under these provisions a) shall be conducted in essentially the same geographical area as those of the non-federal licensee, b) shall be restricted to the purpose for which the particular frequency is authorized to non-federal stations, c) shall be in accordance with the FCC rules and regulations, d) shall be subject to immediate termination if harmful interference is caused to the service rendered by non-federal stations, and e) shall not bar in any way the expansion of non-federal services for which the frequencies are allocated. The procedure for concluding a mutually-approved arrangement required by this provision is given in Section 8.3.3.

2. FCC regulations provide that non-federal stations holding a license for any public safety frequency pursuant to Part 90 of the Commission's rules are authorized the use of the Federal Interoperability Channels in accordance with Section 4.3.16. In addition, non-federal stations licensed by the FCC may be authorized the use of other frequencies assigned to federal radio stations upon appropriate showing by the applicant that such assignment is necessary for intercommunication with federal stations or required for coordination with activities of the Federal Government. Such provision is subject to determination by the FCC, after consultation with the appropriate federal agency or agencies, that the assignment is necessary.

## **7.13 MILITARY COMMUNICATIONS UNDER APPENDIX 13 (Part A2), INTERNATIONAL TELECOMMUNICATION CONVENTION**

1. Stations in the mobile service (including portable-type operations) of the Air Force, Army, Coast Guard, and Navy, when engaged in exercises or tactical operations, may employ any frequencies, in accordance with Appendix 13 (Part A2) of the International Telecommunication Convention provided they cause no interference with the authorized services operating on the frequencies selected.

2. When required by military necessity and in consonance with the provisions set forth in Appendix 13 (Part A2) of the International Telecommunication Convention, minimum performance requirements applicable to the use of Communications-Electronics equipment as prescribed in this Manual<sup>2</sup> may not be met.

3. Where under normal peacetime conditions harmful interference arises to (or from) other operations, performed in accordance with applicable regulatory provisions, as a result of such minimum performance requirements not being met, the military service(s) involved shall to the extent practicable take all reasonable measures to mitigate the harmful interference.

## **7.14 PERFORMANCE OF ELECTRONIC ATTACK TEST, TRAINING, AND EXERCISE OPERATIONS**

1. Frequency use for the performance of electronic attack test, training, and exercise operations is governed by the most recent version of the Chairman, Joint Chiefs of Staff (CJCS) Manual entitled "Performing Electronic Attack in the United States and Canada for Tests, Training, and Exercises." The use of this CJCS manual is mandatory for all DoD components and contractors performing electronic attack test, training, and exercise operations.

2. This CJCS manual contains details concerning authorized frequency bands, geographical restrictions and frequency clearance procedures for conducting electronic attack in the United States and Canada. Release is limited to DoD components (to include the combatant commands) and other federal agencies. Copies are available

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<sup>2</sup> Necessary bandwidths as prescribed in Section 6.3.2. Frequency tolerance as prescribed in Section 5.1. Other minimum performance requirements as prescribed in Sections 5.5 and 5.6.

through controlled internet access (limited to .mil and .gov users) from the CJCS Directives Electronic Library ([https://ca.dtic.mil/cjcs\\_directives/cjcs/manuals.htm](https://ca.dtic.mil/cjcs_directives/cjcs/manuals.htm)).

## 7.15 MILITARY COMMUNICATIONS FOR TACTICAL AND TRAINING OPERATIONS

### 7.15.1 Military Communications in the Bands 3500-4000, 20010-22000, and 22855-24990 kHz for Tactical and Training Operations

1. To meet local military peacetime tactical and training requirements within the United States and Possessions, the military services may employ frequencies in the bands 3500-4000, 20010-22000, and 22855-24990 kHz on a secondary basis to the services of stations authorized on frequencies within these bands provided that:

- a. Operations shall be with field-type portable and mobile equipment.
- b. Minimum antenna power shall be used commensurate with the actual communication requirement but not in excess of 50 watts.
- c. The bandwidth of emission shall not exceed 6 kHz for the lower band or 36 kHz for the upper bands.
- d. Prior to transmission, responsible military personnel shall ascertain that services being performed in the local area will not be disrupted or suffer harmful interference as a result of such military use of frequencies within the local area.
- e. The use of any frequency authorized herein shall be terminated immediately upon notification that harmful interference is being caused.

### 7.15.2 Military Communications in the Broadcast Bands between 4 and 27 MHz, the Maritime Mobile Band between 4.005 and 4.063 MHz, and Specified Frequencies between 2 and 27 MHz for Tactical and Training Operations

1. The military services may employ frequencies in the bands as indicated in paragraph 1 below and specified frequencies in paragraph 2 below in order to meet local peacetime tactical and training requirements within the United States and Possessions (or as indicated below). Such use of frequencies shall be on a secondary basis and subject to the avoidance of harmful interference a) to all operations established in accordance with the international allocations applicable to those bands and b) to all other operations regularly authorized within the United States and Possessions on specific frequencies within those bands or on the specified frequencies.

2. The use of frequencies within the following bands will be conducted as indicated in subparagraphs a) and b) and with minimum antenna power commensurate with the actual communication requirement, but not to exceed the power for specific types of emission as indicated:

<b>kHz</b>	<b>kHz</b>
4005 - 4063	13600 - 13800
5950 - 6200	15100 - 15600
9500 - 9900	21450 - 21850
	25670 - 26100

a. For field type portable and mobile equipment the following parameters apply:

1K10F1B	100 watts mean
100HA1A	200 watts peak
3K00J3E	250 watts peak
2K00A2B	300 watts peak
3K00J7B, 4K00J7B	400 watts peak
3K00J9W, 4K00J9W, 6K00J9W	600 watts peak
6K00B9W	800 watts peak

b. For shipboard mobile equipment the following parameters apply:

100HA1A	500 watts peak
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100HJ2A	500 watts peak
3K00J3E, 2K80J3E	500 watts peak
3K00J7B	1000 watts peak
6K00B9W	2000 watts peak

3. The use of the following frequencies, as indicated below, will be controlled by and coordinated between the Military Departments Frequency Management Offices for operations conducted a) normally between transportable and fixed facilities engaged in long haul HF operations and b) with minimum antenna power commensurate with the actual communication requirement, but not to exceed 10 KW, and with 6K00B9W, 9K00B9W and 12K00B9W emissions only.

<b>kHz</b>	<b>kHz</b>	<b>kHz</b>
2001.0	9958.0	17500.0
2582.0*	9970.0 <sup>(4)</sup>	17519.0 <sup>(3)</sup>
2618.0 <sup>(9)</sup>	10586.0 <sup>(2)</sup>	18036.0 <sup>(1)</sup>
2664.0 <sup>(12)</sup>	10690.0	18060.0
2797.0*	10720.0 <sup>(5)</sup>	18162.5 <sup>(11)</sup>
3373.0	10730.0	19005.0
4445.0	11410.0 <sup>(6)</sup>	19047.0
4505.0 <sup>(4)</sup>	11422.5 <sup>(5)</sup>	19160.0
4528.0	11482.5	19510.0 <sup>(4)</sup>
4562.5	11513.5 <sup>(4)</sup>	20035.0
4595.0 <sup>(6)</sup>	11535.0	20050.0
4985.0 <sup>(4)</sup>	11995.0 <sup>(10)</sup>	20075.0
5370.0 <sup>(4)</sup>	12045.0 <sup>(2)(10)</sup>	20124.0
5400.0 <sup>(3)</sup>	12060.0	20171.0
5434.0	12090.0	20350.0 <sup>(8)</sup>
5817.5 <sup>(2)</sup>	12105.0	20400.0
5820.0 <sup>(2)</sup>	12240.0 <sup>(10)</sup>	20425.0
5835.0*	12255.0 <sup>(2)(10)</sup>	20438.0 <sup>(5)</sup>
6830.0	12324.0 <sup>(4)(10)</sup>	20550.0
6897.5 <sup>(1)</sup>	13545.0	20763.0
6905.0	13610.0 <sup>(4)(10)</sup>	20950.0 <sup>(5)</sup>
6912.5	13680.0 <sup>(10)*</sup>	21856.0 <sup>(6)</sup>
6989.0	14375.0	21886.0 <sup>(6)</sup>
7362.5 <sup>(5)</sup>	14385.0	21918.0 <sup>(6)</sup>
7469.0 <sup>(1)</sup>	14646.0	23180.0
7690.0 <sup>(1)</sup>	14667.0 <sup>(6)</sup>	23500.0
7935.0	14867.5	23600.0
8000.0 <sup>(5)</sup>	15595.0 <sup>(1)(10)</sup>	23690.0
8041.0	15895.0	23700.0
8060.0	16090.0	24120.0
8064.0	16100.0	24510.0
8162.0 <sup>(10)</sup>	16170.0	25360.0
8170.0 <sup>(10)</sup>	16225.0 <sup>(5)</sup>	25425.0
9145.0	16340.0	25516.0
9190.0 <sup>(3)(9)</sup>	16422.5 <sup>(6)(10)</sup>	26575.0 <sup>(9)</sup>
9259.0 <sup>(7)</sup>	17410.0 <sup>(1)(8)(10)</sup>	26650.0 <sup>(5)</sup>
9320.0 <sup>(4)</sup>	17460.0	26750.0
9417.5	17480.0	26850.0

\* 6KB9W and 9KB9W only

<sup>1</sup> Transmit east of 100° west only

<sup>2</sup> Transmit west of 100° west only

<sup>3</sup> Transmit east of 117° west only

<sup>4</sup> Transmit west of 117° west only

<sup>5</sup> NAVCOMMSTA Stockton transmit only

<sup>6</sup> USA to USA only

<sup>7</sup> Not to be used to/from Norfolk, VA

<sup>8</sup> Military services to coordinate with Justice before use

<sup>9</sup> 6KB9W only

<sup>10</sup> This frequency is available until implementation procedures and schedules are determined by future conferences of the International Telecommunication Union (ITU) for Broadcasting or Maritime Mobile Services.

<sup>11</sup> This frequency is available until reaccommodation actions of the International Telecommunication Union (ITU) are completed or until July 1, 1989, whichever is earlier.

<sup>12</sup> For use within central U.S. Coordinate with Coast Guard prior to use near Coast Guard/Coastal areas.

### 7.15.3 Military Communications in Non-Federal Bands Above 25 MHz for Tactical and Training Operations

1. The military services may employ frequencies in certain non-federal bands above 25 MHz, after coordination between the FCC's FAS Liaison representative and military field personnel, for tactical and training operations in the U.S. and Possessions. The military use of non-federal frequencies under the procedures stipulated will not be a bar to the present or future assignment, through the normal IRAC/FCC process, of non-federal frequencies to non-military federal agencies, and, in such military use of non-federal frequencies, protection shall be afforded to federal operations authorized on specific frequencies within the non-federal frequency bands concerned.

2. In order to provide for military tactical and training assignments in the United States and Possessions, military field personnel are authorized to coordinate such assignments with the FCC's FAS Liaison representative without referring these matters to Washington headquarters.

3. Military agencies have agreed that prior to coordinating tactical and training frequency assignments with the FCC's FAS liaison representative, military field representatives will first establish that proposed assignments have a good chance of being compatible with non-federal assignments. Consequently, the FCC is not expected to "engineer" such assignments for the Military.

4. The following procedures will apply to the use of the non-federal bands between 25 and 2400 MHz specified herein:

a. The Military will not request the use of frequencies allocated to non-federal services whenever the tactical and training requirements can be met through the use of federal bands.

b. Military tactical and training assignments shall cause no harmful interference to non-federal assignments and military operations shall be terminated immediately upon notification that harmful interference has occurred.

c. Military tactical and training assignments must accept such interference as may be caused by non-federal spectrum use.

d. Tactical and training assignments shall be temporary for a period of no longer than one year and the military representatives shall re-coordinate if continued use is desired. The military field representatives shall maintain a current list of such assignments and furnish the list to the FCC's FAS liaison representative if requested.

5. The following shall be used as a guide for the coordination of military tactical and training assignments when it has been determined that the use of non-federal bands is necessary:

a. Bands allocated to the broadcasting service for domestic use.

(1) The following are the bands between 25 and 2400 MHz that are allocated for this purpose:

MHz	MHz
54-72	174-216
76-100 (ex. Alaska)	470-608
100-108	614-698

(2) The FCC will not permit military tactical and training assignments on TV or FM channels in the areas where the public is receiving service. In many instances such service is received far beyond the normal service ranges of broadcasting stations. However, reception in such areas shall be protected regardless of the quality of such reception.

b. Bands used for auxiliary broadcast purposes.

(1) The following are the bands between 25 and 2400 MHz that are allocated for this use:

<b>MHz</b>	<b>Use</b>
25.85-26.48	Remote Pickup
152.86-153.35	Remote Pickup
160.86-161.40	Remote Pickup (Puerto Rico and Virgin Islands only)
161.625-161.775	Remote Pickup (except in Puerto Rico and Virgin Islands)
450-451	Remote Pickup
455-456	Remote Pickup
942-952	STL
2025-2110	TV Pickup, TV-STL

(2) Frequencies in bands used by remote pickup, studio transmitter links and other broadcast auxiliaries may be used for military tactical and training purposes providing FCC engineers coordinate such use with the appropriate broadcast station licensees. For example, there is no objection to a military tactical and training assignment co-channel to a remote pickup assignment in the same area provided the broadcast licensee is cognizant of such arrangements and can be assured that in the event a remote broadcast pickup is necessary, any military operations that may be on the air will shut down immediately upon notification.

As an additional example, frequencies which are assigned to studio transmitter links may be utilized by military tactical and training assignments, providing these assignments are coordinated by the FCC with the broadcast licensees involved and the tactical and training assignments so arranged as to cause no harmful interference to an STL. In all cases where a tactical and training assignment is made on an auxiliary broadcast service frequency within interference range of a co-channel FCC licensee, the licensee should be given the name of the military representative to contact in the event interference is caused.

c. Public Safety, Citizens Radio, Industrial, Land Transportation and Maritime Mobile Bands.

(1) The following bands between 25 and 2400 MHz are allocated for this purpose:

<b>MHz</b>	<b>MHz</b>	<b>MHz</b>
25.01-25.33	39.00-40.00	156.675-156.725
26.96-27.54	42.00-43.20	156.875-157.025
29.70-29.80	43.68-46.601	157.45-157.74
30.56-32.00	47.00-49.60	158.10-158.46
33.00-34.00	150.80-152.00	158.70-161.775
35.00-35.20	152.24-152.48	173.20-173.40
35.68-36.00	152.84-156.25	451.00-454.00
37.00-38.00	156.325-156.625	456.00-459.00
		460.00-470.00

(2) Frequencies in bands allocated to these services for land mobile use may be authorized for military tactical and training assignments provided the assignments are coordinated between FCC field engineers and military field representatives. Consequently, personnel in the field will need to take into consideration such factors as local terrain. For example, an obstruction such as a hill or a mountain range might lower considerably the distance between a non-federal and a military tactical and training assignment. On the other hand, there are certain locations where better than average radio propagation conditions exist, and it will be necessary for FCC engineers and military representatives to take this into account. If doubt exists as to the practicability of a proposed tactical and training assignment, tests should be conducted.

d. Bands allocated to non-federal fixed service (excluding common carriers).

(1) The following are the bands between 25 and 2400 MHz that are allocated for this purpose:

<b>MHz</b>	<b>MHz</b>
72.0-73.0	1850-2000
75.4-76.0	2020-2200
76.0-100 (In Alaska)	
952-960	

(2) In bands allocated to the non-federal fixed service (excluding common carrier), military tactical and training assignments may be authorized after coordination with the FCC's FAS Liason representative. It is not possible to develop typical standards for the coordination of such assignments in fixed bands due to the fact that, in

general, highly directive antennas are used and problems of interference protection will vary greatly. Since many military tactical and training operations involve the use of highly directive antennas, it may sometimes be possible to coordinate such assignments, although they may be in the same area as non-federal assignments, by taking into account directive antenna features of the installations involved. In coordinating such assignments FCC engineers may coordinate proposed military tactical and training assignments with FCC licensees whenever there is a doubt as to the compatibility of the proposed military assignments. Tests should be conducted if necessary.

e. Bands allocated to international fixed public services.

(1) The following bands between 25 and 2400 MHz are allocated for this purpose:

<b>MHz</b>
26.95-26.96
29.80-29.89
29.91-30.00

(2) In the above bands, military tactical and training assignments may be authorized after coordination with the FCC's FAS Liaison representative provided that the military use is limited to those periods when propagation conditions would not normally support long distance communication, and therefore could be expected to confine to the local area the potential of interference to non-federal services.

f. Amateur Bands

(1) The following are the bands between 25 and 2400 MHz that are allocated for this purpose:

<b>MHz</b>	<b>MHz</b>
28-29.7	420-450
50-54	902-928
144-148	1240-1300
219-220	2300-2310
222-225	2390-2400 (This band extends to 2450 MHz.)

(2) The following provisions are applicable in the use of the above bands for communication purposes (i.e. for other than radiolocation purposes).

(a) Subject to the provisions of the rules adopted by the Federal Communications Commission, amateur stations generally are operated freely on any frequency within the established amateur bands. Therefore, great care needs to be taken in the coordination and in the use of such frequencies by the Military.

(b) The following conditions shall be observed in the military use of amateur frequency bands between 25 and 2400 MHz for routine day to day tactical and training purposes:

1 Operations on such frequencies will be confined normally to the hours of 0600-1800 local civil time.

2 Prior to transmission on specific frequencies, military personnel should ascertain that such frequencies are not in actual use by amateur stations within the local area in a manner which is likely to suffer harmful interference if the frequencies were used for military operation.

3 In recognition of the primary status of amateur stations as against the secondary status of military frequency use in such bands in peacetime, military personnel have responsibility in the event of, evidence of, or actual complaints of interference, to take effective remedial action without undue delay<sup>3</sup>.

4 Insofar as practical, consideration should be given in planning the use of such frequencies to their employment in a manner or at transmitter locations well removed from areas of civilian population where amateur use is likely. Appropriate measures should be adopted to minimize interference as by the use of minimum radiated power and intermittent transmissions of short duration.

5 It should be recognized that long distance propagation characteristics of the 28 MHz and 50 MHz bands, especially in the case of the former, require that good judgment be exercised in military use of these bands. Only when sky-wave propagation is not present is it practicable to use these bands for anything except extremely low power.

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<sup>3</sup> This refers to military use for communication purposes and not to military radio location uses which have priority status in the amateur bands above 222 MHz.

### 7.15.4 Military Communications in the Federal Bands Between 30 and 50 MHz for Tactical and Training Operations

To meet local military peacetime tactical and training requirements within the United States and Possessions, the military services may employ frequencies in the bands 30.00 to 30.56, 32.00 to 33.00, 34.00 to 35.00, 36.00 to 37.00, 38.00 to 39.00, 40.00 to 42.00, 46.60 to 47.00, and 49.60 to 50.00 MHz on a secondary basis to the services of other federal stations authorized on frequencies within these bands provided that:

- a. Operations shall be with field-type portable and mobile equipment.
- b. Minimum antenna power shall be used commensurate with the actual communication requirement but not in excess of 50 watts.
- c. The bandwidth of emission shall not exceed 6 kHz with type A3E emission or 36 kHz with type F3E emission.
- d. Prior to transmission, responsible military personnel shall ascertain that services being performed by other federal agencies in the local area will not be disrupted or suffer harmful interference as a result of such military use of frequencies within the local area.
- e. The use of any frequency authorized herein shall be terminated immediately upon notification that harmful interference is being caused.

### 7.16 RESERVED

### 7.17 MILITARY COMMUNICATIONS AT TEST RANGES IN NON-FEDERAL BANDS ABOVE 25 MHz

The military departments may employ frequencies in certain non-federal bands above 25 MHz at specified military test ranges after coordination between FCC field personnel and military field personnel.

#### 7.17.1 Locations

The military test ranges and the Geographical Areas of Cognizance are as follows:

Activity	Geographical Area of Cognizance	Service Responsibility
Weapons and Tactics Center, Nellis AFB, Nevada	Entire State of Nevada plus Utah west of 111° W and Idaho South of 44°N.	Air Force
Air Force Eastern Test Range, Patrick AFB, Florida	Area bounded by 24°N, 31°30'N, 77°W, and 83°W.	Air Force
DoD Gulf Area Coordinator, Eglin AFB, Florida	Area bounded by 24°N, 33°30'N, 83°W and 90°W.	Air Force
Pacific Missile Test Center, Pt. Mugu, California	Area enclosed within 322 kilometer radius of Headquarters Building, PMR, and the area of California that lies south of 37°30'N.	Navy
Army Electronic Proving Ground, Ft. Huachuca, Arizona	Entire State of Arizona	Army
Military Ranges within the State of Hawaii	Area enclosed by 322 kilometer radius of Honolulu, Hawaii	CINCPAC
White Sands Missile Range, Las Cruces, New Mexico	Entire State of New Mexico and other U.S. territory enclosed with a 240 kilometer radius of the Headquarters Building, WSMR, plus the area of the States of Utah and Colorado that lies south of 41°N and between 108°W and 111°W.	Army
Military Ranges within the State of Alaska	Entire State of Alaska	USPACOM

## 7.17.2 Frequency Bands

Frequencies in the following bands may be used in these geographical areas in support of the mission of these ranges, subject to the conditions and procedures specified in this part:

<b>MHz</b>	<b>MHz</b>
25.01-25.33	144.0-148.0
25.85-26.48	150.8-156.25
26.95-27.54	156.35-156.7
28.00-29.89	156.9-157.0375
29.91-30.00	157.1875
30.56-32.00	162.0125
33.00-34.00	174.0-216.0
35.00-36.00	450.0-608.0
37.00-38.00	614.0-890.0
39.00-40.00	942.0-960.0
42.00-46.60	1850-2110
47.00-49.60	2450-2690
50.00-73.00	6425-7125
75.40-108.00	10550-10680
	11700-13250

Frequency bands above 13250 MHz are under consideration and will be designated later.

## 7.17.3 Conditions

1. Non-federal allocated bands will not be used if the frequency requirements can be satisfied in federal allocated bands.

2. Proposed operations on non-federal frequencies should normally be limited to those of a highly intermittent nature which can be suspended or adjusted immediately upon notice that interference is being caused to a non-federal service. Care should be exercised in the selection of frequencies for proposed operations to avoid the likelihood of harmful interference to known non-federal operations. Where practicable, provision shall be made for identification of the transmissions of the military station either by the transmission of a call sign or periodic interruption of the transmissions in accordance with a prearranged schedule.

3. Military users of any frequency assigned pursuant to this procedure shall accept any interference that may be caused by non-federal services, shall not cause interference to any non-federal service, and shall not preclude new non-federal assignments on such a frequency.

4. This procedure does not apply to the development of military systems or concepts which may require changes in the National Table of Frequency Allocations. Any such development must be coordinated through appropriate Washington channels.

## 7.17.4 Coordination

1. Proposed federal operations on non-federal frequencies which come within the purview of this procedure shall be coordinated with the FCC Engineer in Charge of the Radio District in which the contemplated operation will occur, prior to the commencement of such operation. No operation on non-federal frequencies shall be conducted without prior concurrence by the FCC District Engineer. If the FCC District Engineer is unable to concur in a proposed operation and circumstances appear to warrant further consideration by higher authority, the request may be referred to military headquarters. Similarly, if the FCC District Engineer believes that circumstances warrant such action he may refer the matter to the Washington Office of the FCC.

2. Requests for coordination submitted to the FCC District Engineer shall include the following information:

a. Security classification, if any.

b. Frequency or frequencies proposed to be used.

c. Transmitter location or area of proposed operation. (If the transmitter is at a fixed location, give the geographic coordinates to the nearest minute as well as the nearest identifiable community. If the operation is portable or mobile, describe the area of proposed operation. If the transmitter is airborne, so specify and describe the general range of operations.)

- d. Emission and bandwidth. (If pulsed emissions are used, give the approximate risetime and repetition rate.)
  - e. Power. (Output power of transmitter.)
  - f. Antenna. (Give type of antenna (whip, dipole, yagi, parabolic, etc.) approximate height of antenna above ground, power gain if any, and direction of main radiation lobe if a directive transmitting antenna is employed.)
  - g. Time of operation. (To the extent practicable, indicate whether the proposed operation will take place at specified hours or during certain periods of the day, whether the transmissions during operation will be continuous or intermittent with some indication as to the degree of intermittence, and whether the contemplated use will occur frequently or only upon special occasions. Such information will assist the FCC District Engineer in properly evaluating potential interference.)
  - h. Call signs. (Call sign information should be supplied, if appropriate. If identification is to be accomplished through periodic interruptions of the transmissions in accordance with a prearranged schedule, supply such a schedule.)
  - i. Expected duration of the proposed operation.
  - j. Remarks. (Any additional information which will be helpful in assessing potential interference.)
3. Military frequency coordinators shall not coordinate proposed frequencies with the FCC until it has been ascertained, to the coordinator's satisfaction, that the terms of this document can be met.

### **7.17.5 Frequency Assignment Lists**

On an annual basis the military frequency coordinators will furnish in duplicate to the appropriate FCC Engineers in Charge a list of current assignments made pursuant to these arrangements.

## **7.18 MILITARY TELEMETERING AND TERRESTRIAL TELECOMMAND IN RADIOLOCATION BANDS**

In order to transmit command signals to airborne vehicles being tracked and to receive status information from the vehicles, military telemetering and terrestrial telecommand operations are authorized in the bands 3100-3650, 5250-5925, 8500-10,000 MHz, 13.4-14.0 and 15.7-17.3 GHz when conducted as an integral part of the operation of authorized stations in the radiolocation service. Such telemetering and terrestrial telecommand operations shall be on a secondary basis to authorized stations operating in accordance with the National Table of Frequency Allocations.

## **7.19 RESERVED**

## **7.20 USE OF NON-FEDERAL FREQUENCIES BY THE FCC FIELD OPERATIONS BUREAU**

The FCC Field Operations Bureau is authorized to transmit on any frequency that is allocated for non-federal use under FCC Rule Parts 21, 22, 73, 74, 81, 83, 87, 90, 95, and 97 for the purpose of enforcement and/or interference resolution.

## **7.21 TEMPEST ZONE TESTING OF PHYSICAL FACILITIES**

1. Federal stations are authorized to transmit necessary emissions for TEMPEST zone testing in the frequency range 10 to 1000 MHz on a non-interference basis to other operations in this band. These TEMPEST zone tests shall be conducted with the following restrictions:

a. The frequency range 10-1000 MHz will be broken into four bands for testing: 10-110 MHz, 100-200 MHz, 200-500 MHz and 500-1000 MHz. A bi-conical antenna will be used for 10-200 MHz. A log periodic antenna will be used above 200 MHz.

b. Testing will be done with a signal generator which produces a continuously swept sine wave. Sweep durations will not exceed two seconds for bands 10-110 and 100-200 MHz; or five seconds for the band 200-500 MHz; or 10 seconds for the band 500-1000 MHz.

c. The transmitting antenna will always be inside a building, and power will not exceed 3.5 watts input to the antenna.

2. Prior to conducting a test, coordination by the test agency's Frequency Assignment Subcommittee (FAS)

representative shall be effected with FAS representatives of all federal agencies and the FCC whenever such tests could affect their radio stations or FCC licensees.

3. Non-federal stations conducting TEMPEST zone testing under contract should apply for license under Part 5 (Experimental Radio Services) of the FCC Rules. These operations shall be coordinated with the contracting agency and other federal agencies by the FCC FAS representative, as appropriate.

## **7.22 USE OF FREQUENCIES 10.525 GHz AND 24.150 GHz OR THE BAND 33.4-36.0 GHz FOR RADIOLOCATION DEVICES**

Federal agencies may operate radio units for the purpose of determining distance, direction, speed or position by means of a radiolocation device on the frequencies 10.525 GHz and 24.150 GHz or in the band 33.4-36.0 GHz, provided FCC type-accepted equipment or equipment developed with identical standards or specifications is used.

## **7.23 FEDERAL GOVERNMENT AGENCIES AS END USERS OF FCC LICENSED COMMERCIAL SERVICES**

Federal Government entities may, without further authority from the Assistant Secretary of Commerce for Communications and Information, operate radio devices as end users in commercial FCC-licensed systems in the services listed below. Operation of end user radio devices is under the control of the FCC licensee, and federal use must be in accordance with FCC rules governing the specified service. This section does not relieve federal users from any other policy requirements and it is the responsibility of the federal user to determine if its operations are eligible to operate under the FCC license or under the FCC rules.

- Paging
- Cellular
- Personal Communications Service
- Specialized Mobile Radio
- Wireless Communications Service
- Consumer and Industrial Signal Boosters<sup>4</sup>
- Blanket licenses for earth stations in the fixed-satellite, e.g., 14/12 GHz, and mobile-satellite services<sup>5</sup>

## **7.24 ESTABLISHING INTEROPERABILITY BETWEEN FEDERAL ENTITIES AND NON-FEDERAL PUBLIC SAFETY ENTITIES**

1. Interoperability may be established between federal entities and non-federal public safety licensees via memorandum of understanding (MOU). The MOU must be agreed to by the federal and non-federal public safety entities.

2. One method of achieving interoperability involves the use of a passive cross patch switch that is installed on the non-federal public safety entity's transmitter. It is important to note that the attachment of any device to the FCC licensed transmitter has the potential to alter the operating characteristics of the transmitter. However, if the cross patch switch is passive and does not alter the transmitting characteristics of the licensed non-federal public safety entity's transmitter, no modified FCC issued license is necessary to permit operation of the non-federal public safety entity's transmitter with the passive cross patch switch.

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<sup>4</sup> This includes use of subscriber-based services under 47 CFR Parts 22 (Cellular), 24 (Broadband PCS), 27 (AWS-1, 700 MHz Lower A-E Blocks, and 700 MHz Upper C Block), and 90 (Specialized MobileRadio) (see FCC Report and Order in the Matter of Amendment of Parts I, 2, 22, 24, 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage Through the Use of Signal Boosters, FCC 13-21 , WT Docket No. 10-4, Adopted and Released February 20, 2013.)

<sup>5</sup> The meaning for "blanket license" is given in 47 CFR, Part 25.

## **7.25 USE OF ELECTRONIC ATTACK AND ELECTRONIC COUNTERMEASURES AND EQUIPMENT**

### **7.25.1 General Definitions**

1. The use of stations or devices designed or intended to cause harmful interference to electromagnetic communications is prohibited unless specifically authorized by law and such use is in accordance with this section or Section 7.14 of this manual. To the extent such stations or devices are so authorized and used by a federal agency, close coordination through NTIA with the Federal Communications Commission (FCC) and any other potentially impacted federal agencies is required to facilitate safe and effective use of these stations and devices and to minimize collateral risk of interference to other authorized users of the spectrum.

2. For purposes of this section, the terms "electronic attack" (EA) and "electronic countermeasures" (ECM) have the meanings given those terms in the documents referenced below: However, in the absence of definitions in those documents, these terms mean the operational deployment of devices, equipment, or techniques with the objective of disrupting the operation, operational effectiveness, or performance of electronics and electrical equipment through the use of jamming, electromagnetic energy, or directed energy to cause harmful interference.

### **7.25.2 By the Department of Justice in Response to Radio-Controlled Improvised Explosive Devices**

1. The Department of Justice (DoJ) is authorized to conduct EA and ECM in accordance with the most recent version of the DoJ document entitled "Authorization of Radio Transmission and the Control of Interference Applicable to the Department of Justice Program for Applying Electronic Countermeasures in the United States in Response to Threats of Radio-Controlled Improvised Explosive Devices."

2. This document contains details of a Federal Bureau of Investigation (FBI) sponsored ECM program designed to address the requirements of bomb squads in response to radio-controlled improvised explosive devices. The DoJ document describes required training and certification procedures for program participants, identifies the type of equipment to be used (along with requirements for tracking, replacement, and retirement of such equipment), and summarizes the general program limits and safeguards such as coordination and reporting requirements for frequency management and interference mitigation and control.

3. This document is only approved for limited release to the program's sponsors and contractors, to trained and certified program participants, and to other federal agencies in connection with the program. Copies are available to the above approved entities only through a controlled distribution by the FBI or by NTIA/IRAC pursuant to its document distribution procedures. DoJ will review this document annually and provide updates to NTIA/IRAC accordingly.

### **7.25.3 By the Military Departments in Response to Threats Posed by Unmanned Aircraft Systems to Covered Facilities and Assets**

1. The military departments are authorized to conduct EA and ECM against unmanned aircraft systems (UAS) and unmanned aircraft (UA) in accordance with Section 130i of Title 10, United States Code, and applicable regulations and guidance documents issued thereunder.

2. Such guidance documents and other applicable directives and policies set forth, among other things, detailed requirements and procedures that govern the use of EA and ECM against UAS/UA, including measures to prevent and mitigate collateral impacts and unintended harmful interference. These measures include coordination and notification requirements and procedures for obtaining specific frequency clearances. These documents also outline operator training, equipment tracking and control, and "stop buzzer" notification requirements.

3. Release of the aforementioned documents is limited to the military departments, other Department of Defense (DoD) components (to include the combatant commands) and other federal agencies. Copies are available only through a controlled distribution by DoD or by NTIA/IRAC pursuant to its document distribution procedures.

#### **7.25.4 By the Department of Energy in Response to Threats Posed by Unmanned Aircraft Systems to Covered Nuclear Facilities and Assets**

1. The Department of Energy (DoE) is authorized to conduct EA and ECM against unmanned aircraft systems (UAS) and unmanned aircraft (UA) in accordance with Section 2661 of Title 50, United States Code, and applicable regulations and guidance documents issued thereunder.

2. Such guidance documents and other applicable directives and policies set forth, among other things, detailed requirements and procedures that govern the use of EA and ECM against UAS/UA, including measures to prevent and mitigate collateral impacts and unintended harmful interference. These measures include coordination and notification requirements and procedures for obtaining specific frequency clearances. These documents also outline operator training, equipment tracking and control, and "stop buzzer" notification requirements.

3. Release of the aforementioned documents is limited to DoE and other federal agencies. Copies are available only through a controlled distribution by DoE or by NTIA/IRAC pursuant to its document distribution procedures.

#### **7.25.5 [Reserved]**

#### **7.25.6 For Testing and Evaluation of EA and ECM Equipment**

1. Unless otherwise authorized by Section 7.14 or the above provisions of this section of this manual, federal agencies engaged in research, development, testing, and evaluation of technologies and equipment for purposes of EA or ECM must conduct all over-the-air operations of such technologies and equipment in accordance with the following provisions under a pre-coordinated special temporary authorization (STA) obtained from NTIA pursuant to Section 8.3.32 of this manual.

2. Notwithstanding the provisions of Section 8.3.32 of this manual and to facilitate close coordination with the FCC and other agencies, the following additional requirements (with reference to the corresponding paragraph in Section 8.3.32) shall apply to any federal agency STA request for testing and evaluation of EA and ECM equipment:

a. Timing (per para. 3 of Sec. 8.3.32). NTIA may provide, at its discretion, more than five (5) business days to circulate such requests among impacted users to ensure adequate interagency review and coordination. No "emergency" STA requests for EA and ECM testing and evaluation operations will be accepted. It is strongly recommended that such requests be:

(1) Submitted to NTIA at least sixty (60) days prior to the requested start date of the proposed operation, if possible, but no such requests shall be submitted later than thirty (30) days before the proposed start date;

(2) Pre-coordinated (per para. 7(a) of Sec. 8.3.32) directly with the Federal Aviation Administration (FAA) contacts below and other affected federal agencies if the requested bands (or in the case of significant emissions outside of such bands) overlap those in which FAA and affected agencies have potential victim assignment(s) (e.g., frequency bands listed under the Aeronautical Advisory Group in Section 1.3.2 and in Section 8.3.16 of this manual);<sup>6</sup>

(3) Pre-coordinated (per para. 7(b) of Sec. 8.3.32) directly with the FCC contacts below if the requested bands overlap any non-Federal allocation listed in the National Table of Frequency Allocations under Part 2 of the FCC's rules (including bands used for unlicensed devices, such as ISM bands at 902-928 MHz, 2.4 GHz, 5 GHz;) or non-Federal authorized use listed in the Table; and

(4) Pre-coordinated (per para. 7(b) of Sec. 8.3.32) directly with potentially affected FCC licensees especially when proposed testing will occur near populated areas.

b. Stop Buzzer Information (per para. 4 of Sec. 8.3.32). Stop buzzer contact information shall be included in the STA request, updated as necessary, and provided to the FCC and FAA contacts below (and other potentially

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<sup>6</sup> FAA requires 30 days lead time for EA/ECM coordination and each request for pre-coordination must include a "Control Number" that includes "NAME OF EXERCISE OR LOCATION", "EA", YEAR, and the NUMBER of the event conducted that fiscal year (e.g., "Blue Dragon EA 17-01"; "Orlando EA 17-03").

affected federal agencies). Such information shall include primary and backup phone numbers and e-mail addresses of on-site federal agency personnel who have authority and ability to shut down testing and evaluation operations in the event of reported interference.

c. Use of Assets Already in the Government Master File (GMF) (per para. 5 of Sec. 8.3.32). Upon request, NTIA may waive this requirement.

d. Additional Data Requirements (per para. 6 of Section 8.3.32). NTIA, at its discretion or upon request from the FCC, FAA or other potentially impacted agencies, may require additional data from the requesting agency, including but not limited to: emissions outside of the requested bands; specific data on frequency agility, power reductions, site location and terrain, direction of transmissions, identification of known population centers that could be affected by the testing, a copy of the test plan, and applicable federal contract or cooperative agreement numbers and contracting officer's point of contact information.

e. FCC and FAA Contact Information. For purposes of pre-coordination and at the same time the STA request is submitted to NTIA, the requesting agency shall provide the information required in items a, b, and d above to the following e-mail addresses:

(1) FCC 24/7 Operations Center:

- [FCCOPS@fcc.gov](mailto:FCCOPS@fcc.gov) (unclassified only) (confirm receipt at 202-418-1122)

(2) FCC, Office of Engineering and Technology, Spectrum Coordination Branch:

- [OET-FAS@fcc.gov](mailto:OET-FAS@fcc.gov) (unclassified only) (confirm receipt at 202-418-2470)

(3) FAA:

- [FAA-DOD-LIAISON@FAA.GOV](mailto:FAA-DOD-LIAISON@FAA.GOV) (unclassified only) or

- [FAA-DOD Liaison@faa.sgov.gov](mailto:FAA-DOD_Liaison@faa.sgov.gov) (SIPRNET)

(confirm receipt with Military Team Lead at 202-595-4624 or Military Liaison at 202-603-4965)

## **7.26 AUTHORIZATION TO UTILIZE SPECTRUM BY FEDERAL SURFACE DEFECT TESTING SYSTEMS FOR LOW OBSERVABLE AIRCRAFT**

Military departments desiring to deploy Surface Defect Testing Systems (SDTS) and associated components in a controlled environment for testing of surface defects on low-observable (LO) aircraft shall submit requests for equipment spectrum certification and frequency assignments to the Spectrum Planning Subcommittee (SPS) and Frequency Assignment Subcommittee (FAS), respectively, in accordance with the requirements and procedures established in Chapters 8 and 10 of the NTIA Manual.

### **7.26.1 SPS Process**

1. The SPS will generally apply the analysis method outlined in Chapter 8 to evaluate the compatibility of the proposed surface defect testing system that fall within the bounds of DSO-CR-13-114 "Assessment of Compatibility between Low Observable (LO) Diagnostic Measurement Systems and Selected Systems" (LO Report)<sup>7</sup>. During the SPS review and preliminary assessment of the system, the coordination trigger-distance tables from the LO Report will be used.

a. If the proposed location and frequency band or bands fall within a coordination trigger-distance, the SPS will request the submitting agency to coordinate with the affected agency or agencies to further assess the potential impact and come up with agreeable interference mitigating techniques or procedures. Techniques might include such actions as reducing power and/or locking out certain frequency bands of concern prior to approving SPS certification. The affected agency or agencies may require the requesting agency to provide more detailed analyses or perform additional measurements. The measurements or analyses may consider additional technical factors of the system and site characteristics. When tests on systems of concern are not feasible, it is possible that a surrogate system may be used.

b. If the proposed location and frequency bands fall outside the coordination trigger-distance, the SPS will certify the equipment without further analyses or measurements.

c. Any additional measurements or analyses used to evaluate or establish compatibility or Trigger Distance table during the SPS review or assessment process will become a resource to be considered for frequency application as well as supporting future spectrum certification requests of new and similar SDTS.

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<sup>7</sup> A copy of this report is located at <http://www.ntia.doc.gov/technical-reports>.

2. If the RF characteristics of an LO system fall outside of the bounds of the characteristics used in the LO Report the submitting agency is required to provide new electromagnetic compatibility reports, coordination trigger-distance tables and/or additional measurements to include supporting test data to the SPS for consideration and approval.

### **7.26.2 FAS Process**

The FAS will use the NTIA certification and the referenced SPS assessment to evaluate the frequency assignment applications for SDTS. The agencies will have a final opportunity to refine any mitigation that might be necessary during the FAS review.

**(Last Page in Chapter 7)**