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30TH SPACE WING**

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SPECTRUM MANAGEMENT

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This publication implements Air Force Policy Directive (AFPD) 33-5, *Warfighting Integration*. It extends the guidance found in Air Force Instruction (AFI) 33-580, *Spectrum Management*, AFI 10-707, *Spectrum Interference Resolution Program*, and AFI 10-707 AFSPC/SUP and are traceable via DOD Instruction (DODI) 4650.01, *Policy and Procedures for Management and Use of the Electromagnetic Spectrum*, DODI 3222.03, *DOD Electromagnetic Environmental Effects (E3) Program*, the *Defense Acquisition Guidebook (DAG)*, Department of Commerce (DOC), National Telecommunications and Information Administration (NTIA) Manual of Regulations and Procedures for Federal Radio Frequency Management, and policies of the United States Military Electronics Communication Board (USMCEB), Joint Frequency Panel (JFP) and the Air Force Spectrum Management Office (AFSMO). This publication establishes policy and procedures and defines responsibilities for the spectrum management process within the 30th Space Wing (30 SW). It includes, but is not limited to, functions of Radio Frequency (RF) equipment procurement, assignment, control, protection, coordination, scheduling, authorized use, monitoring and Electromagnetic Interference (EMI) reporting. This publication is applicable to all military and nonmilitary resident and transient individuals at all levels, and activities, including members of Air Force Reserve Units, the Air National Guard, Civil Air Patrol and other individuals or organizations as required by binding agreement or obligation with the Department of the Air Force, Vandenberg Air Force Base (VAFB) or the Western Range (WR) operating electromagnetic transmitting and receiving systems within 30 SW areas of responsibility, but does not provide a sole means of obtaining approval to site, construct and

operate communications-electronics equipment. Several 30 SW organizations, including Civil Engineer Squadron, Range Safety, and the Medical Group's Bioenvironmental Engineering Element, are involved in this process. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR), using the AF Form 847, *Recommendation for Change of Publication*, route AF Form 847s from the field through the base publications/forms manager (30 SCS/SCOKP). Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule located at <https://www.my.af.mil/afrims/afrims/afrims/rims.cfm>.

SUMMARY OF CHANGES

This publication has been substantially revised and must be completely reviewed. This version incorporates the following changes: Updating of organizational names, office symbols and telephone numbers; revises the content to include information pertinent to RF Requirements Imposed On Range User Programs; Identification of Radiated Field Intensity Limits; Program Initiatives for RF Protection; Range Initiatives to Protect Program RF Components; Protection from Off-Range RF Emitters; Federal Communications Commission (FCC), Department of Defense (DOD) & other government agencies; RF Scheduling; Five Year Closed Loop Certification; DOD Directive to Pre-Coordinate Licensed Commercial Spacelift RF Operations in the Government 2200-2290 MHz Band; Requests for use of Federal Agency (Government) and FCC/Non-Government Unlicensed RF Systems; Global Positioning System (GPS) Re-radiation (Re-rad) Systems; Personal Wireless Communications System (PWCS) Operation; utilizing FCC Licensed Amateur (HAM) Radios, Citizens-Band (Public Radio); Business-Band (FCC Licensed) Mobile Radios, Cellular Phones, and Personal Data Assistants (PDA); Collateral Coordination Requirements for RF Use; and Parameters for filing an Electromagnetic Interference (EMI) Report are identified as directed by AFI 10-707, *Spectrum Interference Resolution Program*. The information referenced in para. 3.6.1. through 3.6.2. supersedes previous information referenced in the rescinded 30 SWI 33-117, *Amateur, Citizens-Band, Business-Band, Radio-Telephone and Low Power Communications Device Operations*.

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1. Overview.

1.1. The Radio Frequency (RF) Spectrum is a limited natural resource vital to the support of the Air Force WR and VAFB operations. The intensive requirements placed on this resource require effective management at all command levels to ensure that radio frequencies may be provided to meet essential mission requirements. AFI 33-580 provides information instructions and directions for the implementation of a frequency management program to ensure effective and efficient use of available RF spectrum. The Air Force Spectrum Management Office is responsible for AF spectrum allocation use. All processes and procedures are traceable via DODI 5000.2, DODI 4650.01, DODI 3222.03, the *Defense Acquisition Guidebook*, along with MIL STD 461F (subsystems) and MIL STD 464C (E3 for systems), which clearly define the DOD process of determining radio frequency spectrum dependent systems supportability and certification. The Military Electronics Communication Board develops Joint DOD RF Spectrum Policy, and in addition both spectrum supportability and determination of vulnerability to electromagnetic environmental effects (E3) are required at various acquisition milestones via AFI 99-103, *Capabilities-Based Test and Evaluation* and AFMAN 63-119, *Certification of System Readiness for Dedicated Operational Test and Evaluation*. The Office of the Secretary of Defense requires oversight to ensure identification of requirements for E3 control shall be initiated early during the concept refinement and technology development phases, fully defined prior to Milestone C (*System Development & Demonstration*), and verified throughout the acquisition process.

2. Responsibilities.

2.1. The Commander, 30th Space Wing (30 SW/CC) shall appoint the Installation Spectrum Manager (ISM), per AFI 33-580.

2.1.1. The 30 SW Spectrum Management Office (30 SW SMO) ISM, (30 SCS/SCORF), duty phone (805) 605-3660 and the WR Spectrum Manager, (30 SCS/SCORF), duty phone (805) 606-6695, are responsible for providing installation spectrum management support for all VAFB and WR activities. Such support includes radio frequency guidance and policy, planning, compatibility analyses, coordination and providing authorization to operate, spectral measurements, surveillance and control, and electromagnetic interference (EMI) resolution.

2.2. The 2d Range Operations Squadron Scheduling Office (2 ROPS/DOS, duty phone (805) 606-8825) shall schedule all RF usage for WR users and assets. This does not include base infrastructure communications, Supervisory Control And Data Acquisition (SCADA) systems, Air Traffic Control (ATC) radio, Navigational Aids (NAVAIDS), and meteorological (weather) systems. Range programs must schedule all “open” or *certified* “closed-loop” radio frequency operations on radio frequencies, listed in appropriate program

specific Operations Directives (ODs) produced by the Range Program Support Office, (2 ROPS/DOF), duty phone, (805) 606-3953. Range Scheduling will not schedule radio frequencies not documented in 30 SW approved range support documentation.

2.3. The Frequency Control and Analysis Center (FCAC) of the Launch and Test Range System (LTRS) Integrated Support Contract (LISC) shall provide confirmation of RF compatibility for all scheduled RF use and promulgate any restrictions necessary to prevent EMI. Radiation restrictions, caveats, etc., are noted to 2 ROPS/DOS, for inclusion in scheduling documents. The FCAC is the focal point for EMI reports from range and base infrastructure RF dependent electronic systems. See the EMI Reporting procedure in para 3.8.

2.4. The 30 SW/CC, is the final authority for all matters that deal with RF usage on VAFB and the WR. Issues that cannot be mutually resolved at the working level will be presented to the 30th Operations Group Commander (30 OG/CC) for resolution by the 30 SW/CC.

2.5. Program/Project/Acquisition Offices, Operating Units, Test Organizations, Tenant Units, and other using activities will provide, in writing to the 30 SW SMO, the name, e-mail address, and phone number of a POC for unit frequency matters and provide updated information immediately when the information changes.

2.5.1. The appointed POC will be responsible for the requirements in AFI 33-580, para 3.1.8.

3. Procedures.

3.1. RF System Spectrum Certification. DOD Instruction 4650.01 requires that all DOD components obtain RF guidance (spectrum certification) for communications-electronics systems from the United States Military Electronics Communication Board (USMCEB). Contractual obligations to procure, develop, or use communications-electronics equipment that utilizes electromagnetic energy shall not be assumed until a frequency certification has been obtained and the availability of appropriate frequency assignment support is assured. Spectrum certification approval is obtained by submitting a DD Form 1494, *Application for Equipment Frequency Allocation*. Activities planning to develop, procure or modify a system involving the transmission or reception of RF energy must include the 30 SW SMO in the initial planning phase. This ensures that any new or modified equipment is theoretically, conditionally compatible in the Range environment, and conforms to DOD regulations and agreements relative to RF spectrum certification (approval) of the device. USMCEB conditionally and unconditionally (certified with caveats and restrictions) approved RF systems still have to be evaluated locally, prior to licensing them for use on the Range. The 30 SW SMO will evaluate the specific system(s) to ensure they are compatible within the 30th Space Wing's operational RF environment.

3.1.1. If the equipment has not been approved for use within the DOD, the program sponsor must submit a DD Form 1494, through the sponsor's major command (MAJCOM) channels, after coordinating with 30 SW SMO, who maintains a list of all approved DOD equipment and will provide guidance. Per AFI 33-580, Normal lead time for Operational, Non-Space Systems is "*not less than nine months prior to the Milestone C Decision or contractual obligations for operational procurement or acquisition activities involving wireless RF devices.*" Operational Space Systems lead time is "*no*

later than two years before satellite launch.” Realistic approval times for Non-Space Systems, is 18-36 months and Operational Space Systems is 24-48 months before launch.

3.2. Radio Frequency Authorization (RFA). All activities operating Radio Frequency (RF) devices must have an RFA issued by the 30 SW SMO. Any command, agency, visiting unit, or business (contractor) who holds or receives RF authorizations from either a respective Major Command/Military Department (MAJCOM/MILDEP), or the FCC must provide a copy of the RFA/License to the 30 SW SMO for validation, to obtain approval for operation within the 30 SW Area of Responsibility (AOR) no later than 14 working days prior to expected usage start date.

3.2.1. New or Modified Radio Frequency Authorizations (RFAs): To comply with the acquisition statutory and regulatory directives, activities acquiring new radio frequency devices or modifying existing RF systems must obtain written coordination from the 30 SW SMO prior to procurement or modifications of RF systems. To ensure specific radio frequency selection compatibility, equipment certification applications for radio frequency allocations (DD Form 1494) and Standard Frequency Action Format (SFAF) requests for specific operational radio frequency authorization must be approved. The 30 SW SMO may issue local temporary authorizations or request MILDEP level special temporary authorizations (STAs) depending on the particular spectrum and the operational scope and time constraints of the requirement.

3.2.1.1. Changes to RF equipment which affect the authorized operating locations require 30 SW SMO approval and a new RFA prior to changing the operating location.

3.2.2. RFA Review: The 30 SW SMO will review radio frequency authorizations 90 days prior to the date listed in the RFA or sooner if a modification is required. Short term authorizations will be reviewed within the term limits of the authorization.

3.2.3. Special Temporary Authorization (STA) RFAs may be obtained for short term requirements for approved (spectrum certified) RF systems (para 3.2.1.).

3.3. RF Requirements Imposed By and On Range User Programs.

3.3.1. Identification of Radiated Field Intensity Limits: To minimize the potential for compromise to program RF sensitive components, the program must identify maximum electric field (e-field) intensities that program components may be exposed to during the movement of the components through transport, test, and launch. This data must be documented by the Range Program Support Management Office (2 ROPS/DOF), via the Universal Documentation System (UDS).

3.3.1.1. Conditions of RF Vulnerability. Describe the specific frequency range and the incident field intensity beyond which damage may occur, in volts per meter (V/m), or watts per meter squared (W/m², peak and average) and the equipment state in which vulnerability occurs (i.e., equipment on or off). Do not list a blanket restriction, e.g., “10 Volts per Meter (10V/m), from 1 to 40 GHz, at all locations.”

3.3.1.2. Test Data Imposing Limits. RF vulnerabilities must be described and relate to actual test data. The fact that no radiated and/or conducted susceptibility EMI and electromagnetic compatibility (EMC) test data exists for specific RF components

does not constitute a valid rationale for imposing operational limitations on Range emitters.

3.3.2. Program Initiatives for RF Protection. The design and operation of RF energy vulnerable systems requires the owner/operator to take measures to protect vulnerable systems from incident level RF environments.

3.3.2.1. RF protection mechanisms are best accomplished in the immediate (local) area of the vulnerable system, rather than trying to impose limitations over a global RF environment.

3.3.2.2. Mechanisms and devices commonly used to assist in protection of RF sensitive components during transport, testing and launch are shielded containers, shielded rooms, and shielded payload fairings, and the use of absorptive materials, faraday shields, and bonding materials.

3.3.3. Range Initiatives to Protect Program RF Components. When a program is unable to provide *sufficient* self-protection of RF sensitive components during transport, testing and launch due to the potential for higher incident field intensities that exceed the capacity of program self-protection mechanisms, the vulnerable program elements may be protected by scheduling “radio frequency protection,” to affect the RF operation of specific emitters.

3.3.3.1. Programs may request the Range Scheduling Office, via specific (signed) range UDS, to schedule pertinent Range instrumentation either turned “off” (“RF Silence”), or “sector-blanked,” to prevent incident level RF exposure to operationally vulnerable RF components.

3.3.3.1.1. The Range may suspend scheduled Program RF silence, or sector-blanking operations of Range tracking radar in order to meet tracking support safety requirements during local launch support and/or in support of NASA Commercial Space Capabilities Program (“Current and Future Crew and Cargo Capabilities”) contingency landings at Edwards AFB and Vandenberg AFB. Note also that there may be “short notice” or “no notice” notifications, relative to the support of space contingencies.

3.3.4. Protection from Off-Range RF Emitters – Civil FCC, DOD and other Government Agencies.

3.3.4.1. FCC licensed emitters aboard civil aircraft and ocean vessels may transit the WR in approved air corridors and sea lanes. These RF systems are primarily navigational radar and voice communications radios, not under WR control, and will not be contacted to request inhibiting their operation. Note that launch hazard impact zones may cause closure of specific on-shore and off shore areas, which may incidentally affect the amount of traffic and RF systems encountered in those affected areas.

3.3.4.2. RF operations from Off-Range DOD and other Government Agencies licensed RF emitters, will be monitored and controlled through the LISC Frequency Control & Analysis Center (FCAC) System’s use of the Integrated Frequency De-

Confliction System (IFDS). DOD RF activities that are not scheduled in the IFDS, or other range scheduling systems, may be difficult to identify and mitigate.

3.3.5. RF Scheduling. All RF usage at VAFB, open and closed loop radiation, is subject to scheduling unless otherwise specified by the RF authorization. RF requirements for scheduled (numbered) Range tests and operations are automatically authorized when the test is included in the official Range schedule and the applicable UDS Operations Directive (OD) specifies those frequencies authorized for use during the particular test or operation. To schedule an operation, Range Customers contact the Range Scheduling Office (2 ROPS/DOS) and provide their forecasted RF requirements, UDS Operations Directive (OD) number and JON .

3.3.5.1. 2 ROPS/DOS will coordinate Range RF requirements with the FCAC to confirm frequency compatibility and to determine restrictions that may be necessary to prevent RF conflicts. Confirmation of scheduled times, along with any radiation restrictions, are passed to Range Customers through 2 ROPS/DOS.

3.3.5.2. The FCAC will review the Vandenberg Tracking Station (VTS), Air Force Satellite Control Facility Network (AFSCN), 21 SOPS, satellite telemetry support schedule and identify RF conflicts from scheduled local operations to 2 ROPS/DOS. This will be accomplished prior to 0700 local time daily. The 2 ROPS/DOS will notify the Range Customer and request that the pertinent RF system be “silenced,” during the period of the scheduled satellite support event. If a compromise cannot be reached, the FCAC will advise the AFSCN, through the VTS. Neither the FCAC nor the 2 ROPS/DOS makes priority decisions. In incidents of unscheduled Range activity interfering with VTS satellite support, the FCAC may contact the unscheduled Range Customer directly, to expeditiously mitigate the interference. FCAC will also contact 2 ROPS/DOF and the 30 SW SMO.

3.3.5.3. The Universal Documentation System is used exclusively for conducting and requesting mission support. Reference 30 SWI 13-203, *Western Range Scheduling*, which explains the process and procedures to be followed by Range Customers.

3.3.6. Five Year Closed-Loop Certification. Space and Missile test operators should use *Range certified closed RF circuit* (“closed-loop”) systems for testing as much as possible to reduce delays in obtaining scheduled RF periods. Requests for closed loop certification will be sent to the 30 SW SMO with a block diagram of the proposed system from the radiating element through each relay point to the final analysis location and including any local monitoring facilities. The LISC RF Measurements Center (RFMC) will measure the system on a scheduled fee basis to ensure and verify the integrity of the total system. Upon successful completion of the test, the program will receive a copy of the test data and a letter stating that the system may be scheduled as a “closed-loop” system for a five (5) year period, as long as it remains intact, and a copy will be provided to the 30 SW SMO.

3.3.6.1. Modifications to previously tested and certified closed-loop RF systems or failed (detected) systems, will require a new closed-loop certification. Changes to the system description (block diagram) and a request for scheduling must be submitted before it may be scheduled for closed-loop operation. It may be scheduled as an “open-loop” system until a successful closed-loop certification is completed.

3.3.6.1.1. Radiation leakage from the system must not exceed the following limits at a distance of 300-feet from any part of the circuit as referenced in Table 1 (below).

Table 1. Electromagnetic Radiators Leakage Limits.

Beacons and Transmitters		Limits
Non-pulsed (rms level)	1000 MHz and below	25 $\mu\text{V}/\text{m}$ (28 dB above 1 $\mu\text{V}/\text{m}$)
	Above 1 GHz	100 pW/m^2 (-100 dBW/m^2), 194 $\mu\text{V}/\text{m}$ (46 dB above 1 $\mu\text{V}/\text{m}$)
Pulsed (peak levels)	100 pW/m^2	(-100 dBW/m^2 or -70 dBm/m^2)
	or 194 $\mu\text{V}/\text{m}$	194 microvolt's /meter (46 dB above 1 $\mu\text{V}/\text{m}$)

3.3.6.2. A closed loop system that is detected operating in excess of the Table 1 limits or has undergone a configuration change will be scheduled only in an open loop mode until it is recertified.

3.3.6.3. Closed loop systems that exceed a nominal “system configuration” life beyond 5 years, without a configuration change and subsequent recertification, must be recertified.

3.3.6.4. Maintenance of RF dependent equipment and systems involving a transmitter, receiver, transmission line, or grounding will require a LISC Frequency Control Analysis report prior to being placed back into operation.

3.3.7. DOD Directive to Pre-coordinate Licensed Commercial Spacelift RF Operations: In the Federal 2200-2290 MHz band. In August 1999, the Secretary of Defense directed that all commercial (turn-key) Department of Transportation (DOT) licensed space operators must request pre-coordination of spacelift-to-orbit telemetry and of on-board ascent video downlink transmitters that will operate in U.S. RF spectrum from Federal launch sites. Radios used for non-federally sponsored launch events will require FCC licensed spectrum.

3.3.7.1. The DOD procedure to ensure that all spacelift performed by commercial operators coordinate each event's usage of the Government spectrum resulted in a DOD/NASA/NOAA Memorandum of Agreement, which states (in part) that “*Commercial space launch use of the band must be conducted on an exception basis to the U.S. Table of Frequency Allocations. This revised DOD spectrum Policy allows commercial space launch use of Government allocated spectrum on an exception basis. It will remain in effect until identification of suitable alternative commercial space launch spectrum and further development/operation of commercial spaceports.*” All spacelift RF spectrum use is required for national level pre-flight RF de-confliction.

3.3.7.2. 2 ROPS/DOF will provide program points of contact for the 30 SW SMO to obtain the required data elements contained in Tables 2, “Request for DOD/NASA/NOAA Space Launch Frequency Coordination, 2200-2290 MHz” & Table 3, “Mission Elapsed Time Trajectory File in Earth Centered Fixed (ECF) Cartesian Vectors Format.” Information is required not later than 30 days prior to all scheduled spacelift (launch) events for review and forwarding to the AFSMO.

Table 2. Request for DOD/NASA/NOAA Space Launch Frequency Coordination.

Required Data/Information	Response
Name of Agency	
Name of Payload	
Name of Launch Vehicle	
Launch Site (with coordinates)	
Launch Time-Window (Primary and Backup)	
Orbital Location (Orbit Insertion)	
Required Frequency(ies)	
Location of Transmitter on Launch Vehicle or Payload (e.g., 1st stage, 2nd stage, etc.)	
EIRP (Watts, or dBW, or milli-Watts, or dBm) for Each Required Frequency	
Transmitted Bandwidth for Each Required Frequency (state if filtered)	
-3 dB Bandwidth for Each Required Frequency (if filtered, bandwidth before or after filter)	
-20 dB Bandwidth for Each Required Frequency (bandwidth before or after filter)	
-60 dB Bandwidth for Each Required Frequency (bandwidth before or after filter)	
Nature of Modulating Signal(s) (modulation type e.g., BPSK, QPSK, APK, FSK, Analog, etc.) If digital: state the final symbol rate in “ <i>symbols/second</i> ,” after all overhead encoding, or the final bit rate in “ <i>bits/second</i> ” after all overhead encoding. If FSK, include the type of FSK and the peak-to-peak frequency deviation as well as the final symbol rate, or final bit rate, and <u>also describe any subcarriers.</u>	
Duration of Transmission(s), to Include On/Off Time (nominal and maximum durations)	
Transmit Antenna Type, Gain, Beamwidth	
Coordinates of Receiving Ground Station(s)	
Ground Receiver Sensitivity and Selectivity, Antenna Type, Gain, Beamwidth	
Ground Station(s) Where Video Signal Will Be Receiving (this is very important because of the large bandwidth of the video signal)	
Ground Track from Lift-Off until Payload Separation	
ECF Cartesian Vectors Format (position and velocity vs. time or	

position, velocity, and acceleration vs. time) Mission Elapsed Time references in minimum 60 sec (1 Min) intervals for Each Phase of Launch Through the End of Transmission (there should be vectors for each time step, from the beginning of the launch out to the maximum duration, not just out to the nominal duration) (Table 3)	
2 dimensional ground track graphic of the launch ascent to orbit	
Primary and Alternate POC for Questions (Include Name, Email, Commercial Phone and Fax Numbers)	

Table 3. Mission Elapsed Time Trajectory File in Earth Centered Fixed (ECF) Cartesian Vectors Format.

Earth Centered Fixed (ECF) Vector Example Format						
MET (seconds)	x (km, nmi)	y (km, nmi)	z (km, nmi)	x dot (km/s, nmi/s)	y dot (km/s, nmi/s)	z dot (km/s, nmi/s)
0						
60						
120						
...						
Last Transmission						
Notes:						
1. ECF format should not be confused with Earth Centered Inertial (ECI) Vectors.						
2. Time steps should be small enough to ensure an unobstructed line-of-sight between each data point until end of launch. 60 second time steps preferred.						
3. Units for each of the values should be provided (e.g., km, nmi, or ft, km/s, nmi/s, or ft/sec).						
4. Provide 2-D ground trace of launch trajectory, if available.						

3.3.7.2.1. The AFSMO will coordinate the event with national spectrum planning authorities.

3.4. Unlicensed Government and Non-Government RF Systems. The 30 SW ISM is responsible to the 30 SW/CC to ensure that unlicensed Code of Federal Regulations (CFR), Title 47, U.S.C. Part 15 low power RF Devices authorized for use, within 30 SW areas of responsibility, do not affect licensed RF systems within 30 SW infrastructure or within adjacent civil communities. The 30 SW/CC will aggressively protect Air Force mission equipment from any interference caused by Part 15 devices.

3.4.1. All users procuring items in this category must contact the 30 SW SMO for approval prior to procuring such items.

Table 4. User shall provide the following to the 30SW SMO.

Owning Organization:
POC:
Telephone Number:
Manufacturer:
Model Number:
FCC Part 15 Approval number:
Transmitter Frequency:
Output Power:
Emission:
Antenna type and gain:
Location (GPS coordinates) for use:

3.4.2. Federal agencies operating unlicensed (Part 15) emitters within the United States & Possessions may be operated officially without an NTIA approved frequency assignment. However, DOD requires a radio frequency assignment to be registered in the Frequency Resource Record System (FRRS) and DD Form 1494 or Equipment Location – Certification Information Database (EL-CID) type information be on file for these devices. This is accomplished through the 30 SW SMO.

3.4.3. Unlicensed RF devices are not protected from interference, and must not cause interference to licensed RF devices. A statement to this effect will be added to each RFA issued by the 30 SW SMO requesting use of these devices. Unlicensed devices in use by the 30 SW and tenants, AF contractors, and range customers, under the control of the 30 SW, are to operate in compliance with the 47 CFR, Part 15. Government operators are cautioned not to use these systems for critical command and control applications essential for mission success, protection of human life or high value assets. Prior to granting approval, requesting users will agree in writing that they understand that all unlicensed devices must accept any and all interference up to and including interference that renders the device inoperable. They must agree that the 30 SW SMO will not intervene to protect the device from any interference including from other unlicensed devices. Users must also agree that they will cease transmissions immediately upon notification that the device is causing interference to a licensed device and will not resume operations until such time as it can be proven not to cause further interference.

3.4.4. Wireless Local Area Networks (WLANs), Radio LANS, and the infrastructure associated with Internet access points (“Hot Spots”) for various public and private communications and data requirements must be authorized by the 30 SW SMO and registered within the FRRS (See 3.4.1). WLAN, also known as WiFi, may be authorized on a case by case basis. WLANs using Unlicensed-National Information Infrastructure (U-NII) devices in the 5 GHz band are restricted to use of bands U-NII 1, U-NII 2 with Dynamic Frequency Selection (DFS) and Transmitter Power Control (TPC) only. Devices in the U-NII 3 and U-NII 4 bands are not authorized for use on VAFB or the WR.

3.4.5. Signal boosters are devices that provide improved wireless coverage. To this end, signal boosters are classified into two distinct, straight-forward categories, Consumer Signal Boosters and Industrial Signal Boosters.

3.4.5.1. Consumer Signal Boosters are devices that are marketed to, and sold for, personal use by individuals. Consumer Signal Boosters must have some form of provider consent prior to consumer use, and be accurately registered with the consumer's wireless provider (s). Wideband Consumer Signal Boosters must be registered with all providers that are affected by the booster. Consumer Signal Boosters are designed to operate in a fixed location in a building. In the event a Consumer Signal Booster causes harmful interference, once the Consumer Signal Booster operator is informed of such interference by the FCC, a wireless provider, the FCAC or 30 SW SMO, the operator must cease signal booster operation. A wireless provider can shut off a subscriber's service if the subscriber refuses to shut down a signal booster that causes harmful interference. These devices must follow the same procedure as all Part 15 Devices. (See 3.4.1)

3.4.5.1.1. Consumer Signal Booster acquisition must be approved, prior to purchase, using the Work Order Management System (WOMS) and FARS regulations. If WOMS access is not available contact the 30 SW SMO.

3.4.5.2. Industrial Signal Boosters are all signal boosters other than Consumer Signal Boosters. The classification of Industrial Signal Boosters are designed for installation by licensees or qualified installers. Industrial Signal Boosters require an FCC license. *These devices are not authorized for use by Federal Government agencies.*

3.5. Global Positioning System (GPS) Re-radiation (RERAD) Systems. The use of these devices must be coordinated with the Installation Spectrum Manager and approved and licensed by the NTIA.

3.5.1. NTIA may approve these devices in accordance with NTIA Manual Chapter 8.3.28, Use of Fixed Devices that Re-Radiate signals received from the Global Positioning System.

3.5.1.1. Individual authorization is for indoor use only and is required for each device at a specific site.

3.5.1.2. Applications for frequency assignments should be applied for as an experimental station class with a note indicating the device is to be used as "Experimental Radio navigation Satellite Service (RNSS) Test Equipment" for the purpose of testing GPS receivers and a description of how the device will be used.

3.5.1.3. Approved applications for frequency assignment will be entered in the Government Master File (GMF). After the frequency assignment has been approved by the NTIA it will be entered into the Frequency Resource Record System (FRRS) which is maintained by the Joint Spectrum Center.

3.5.1.4. The maximum length of the frequency assignment will be 2 years, with renewal possible.

3.5.1.5. The area of potential interference to GPS reception (e.g., military or contractor facility) has to be under the control of the user.

3.5.1.6. The maximum Effective Isotropic Radiated Power (EIRP) must be such that the calculated emissions are no greater than -140 dBm/24 MHz as received by an isotropic antenna at a distance of 100 feet (30 meters) from the building where the test is being conducted. The calculations showing compliance with this requirement must be provided with the application for frequency assignment and should be based on free space propagation with no allowance for additional attenuation (e.g., building attenuation).

3.5.1.7. GPS users, in the area of potential interference to GPS reception, must be notified that GPS information may be impacted for periods of time. Notification will be posted on the U.S. Coast Guard website, www.navcen.uscg.gov.

3.5.1.8. The use is limited to activity for the purpose of testing RNSS equipment/systems.

3.5.1.9. A “Stop Buzzer” point of contact for the authorized device must be identified and available at all times during GPS re-radiation operation of the device under any condition. Stop buzzer contacts must be available whenever the system is radiating and must have the authority and ability to cease transmissions immediately upon notification.

3.6. Personal Wireless Communications System (PWCS) (FCC Licensed), Amateur (HAM) Radios, Citizens-Band (Public Radio), Business-Band (FCC Licensed) Mobile Radios, Cellular Phones, and Personal Data Assistants (PDA) requirements are contained in CFR Title 47 and AFI 33-590 and AFI 33-580.

3.6.1. Per AFI 33-580, resident and transient owners of licensed amateur, citizens-band, FCC licensed business-band radios, cellular telephone transmitters, and Personal Communications System (PCS) devices, *except for resident and transient contractors* (para, 3.6.1.1.) are not required to register the devices for use. Unlicensed radios in the Family Radio Service (FRS) and licensed General Mobile Radio Service (GMRS) do not require local registration, but GMRS licensees may extend the use of their license only to immediate family for personal or business use. The FCC allows FRS radios for “family recreational use” and for business use in “small businesses” only. However, the DOD requires a frequency assignment registered in the FRRS and either DD Form 1494 or EL CID type information on file for information purposes. This is accomplished through the 30 SW SMO. (Refer to 3.4.1 for required information) Cellular telephone, smartphone, iPhone, iWatch and MIFI devices are exempt.

3.6.1.1. Resident and transient contractors must register all radio communications devices, except cellular telephones, that will be used during the conduct of their business at 30 SW operating locations. The respective organization’s contracting office (Government or a Range Contractor) must register their sub-contractor’s communications systems, by providing the 30 SW SMO the duration of the contract period, work locations, hours of operation, and copies of the contractor’s FCC licenses. Radios that operate in FCC licensed spectrum require an FCC license. FRS radios may be authorized for “small business,” and the GMRS Band may be used only by immediate family members of a “family owned business.”

3.6.2. All non-government RF transmitting devices may be restricted within designated mission related satellite and launch vehicle processing areas, launch vehicle ordnance and fuel storage areas, and communications equipment rooms, due to electromagnetic damage potential to sensitive RF components, and potential ignition hazards. Cellular devices (Personal Communication System, PDA, iWatch type and Laptops) may also be restricted for program security reasons.

3.7. Collateral Coordination Requirements for RF Systems Use within 30 SW Areas of Responsibility (AOR).

3.7.1. 30th Contracting Squadron (30 CONS) ensures registration of all contractor operated non-Gov't Furnished Equipment (GFE) RF devices with the 30 SW SMO.

3.7.2. 30th Civil Engineer Squadron (30 CES) reviews requests for RF antenna construction. Permits require an approved AF Form 332, *Base Civil Engineer Work Request* and an AF Form 813, *Request for Environmental Impact Analysis*. All construction work requires National Environmental Policy Act (NEPA) documentation, some of which requires significant amounts of time to process. The earlier the request is received, the less potential for project impact. Both AF Form 332 and AF Form 813 can be found on the AF e-publishing web page.

3.7.3. 30th Medical Group (30 MDOS/SGOJ) personnel ensure portable RF devices are not used in proximity to patient care electronic equipment.

3.7.3.1. The 30 MDOS Bioenvironmental Engineering Element, (30 MDOS/SGOJ), duty phone 805-606-7811, is responsible to survey all RF radiation producing systems within the 30 SW AOR, to define and document biological radiation hazards. Procurers of potentially hazardous RF equipment must obtain a hazard assessment from MDOS. The system POC will provide preliminary RF specifications, so that a theoretical hazard evaluation may be conducted prior to an operational RF survey of resident field intensity levels. This review must be accomplished before the RF system is approved for routine operation and should occur in concert with a Wing (Ground) Safety assessment.

3.7.4. The 30 SW Safety Office (30 SW/SE) ensures RF devices do not pose hazards to personnel (biological), ordnance or fuels. No ground-based RF system shall be installed, erected, relocated, or modified without prior approval from Wing Safety. For completion of its annual Electromagnetic Radiation Survey 30 SW/SE will verify locations, frequency ranges, transmitting power levels, and transmitting patterns (gain) of RF emitters through 30 SCS/SCORF. 30 SCS/SCORF will provide a copy of frequency authorizations to the base Safety Office.

3.7.5. Operations Security (OPSEC). Users of privately owned and operated radio frequency equipment and/or non-secure GFE communications systems must not transmit missile operation, or other sensitive information.

3.7.6. Security, law enforcement and emergency service vehicles and personnel are exempt from posted no transmit areas, except for radio exclusion restrictions in the vicinity of rocket and missile component transport convoys, and within exclusion circles established by Wing Range Safety officials in the vicinity of launch facilities.

3.7.7. If officials suspect that government operations may be in jeopardy, the private use of radio transmitters may be further restricted or prohibited by order of the 30 SW/CC.

3.8. Electro-Magnetic Interference (EMI) is any Electro-Magnetic (EM) disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment.

3.8.1. EMI Reporting. 30 SW and VAFB tenant units will report EMI to the LISC (Range) FCAC at Building 7011, Room 302, duty phone (805) 606-9247. Secure Telephone Unit (STU) is available to the SECRET level.

3.8.2. Information needed to initiate an EMI Report per the Air Force Spectrum Interference Resolution Program IAW AFI 10-707, *Spectrum Interference Resolution Program* and AFI 10-707_AFSPCSUP, *Spectrum Interference Resolution Program* is contained in Attachment 2.

3.8.3. HOSTILE interference is defined as a source indicating an imminent or actual threat, purposeful interference, intrusion or attack on any US asset, to include US space systems and will be reported to the FCAC via the most appropriate secure media, e.g., secure telephone, SIPRNET, or courier. For the purposes of this instruction, any of the aforementioned acts although suspected or ultimately determined to be of domestic origin (whether foreign or not) are still considered HOSTILE and will be reported via classified media.

3.8.3.1. The FCAC will report all hostile, suspected hostile and unknown (possible hostile) EMI to the 30th Space Wing Command Post, 30 SW/CP, duty phone (805) 606- 9961, 62 or 63 and 30 SW SMO, via a SECRET level secure telephone and initiate an EMI Report. The 30 SW/CP may request 30th Security Forces Squadron (30 SFS) and/or other appropriate law enforcement assistance.

3.8.4. Initial EMI Report. The 30 SW SMO, upon receipt of the FCAC initial EMI report, will initiate a classified EMI report to the Joint Space Operations Center (JSpOC) and HQ AFSPC Command Center via SIPRNET, within 3 hours for AFSPC Mission-Systems and 24 hours for all other systems, per AFI 10-707 AFSPCSUP.

3.8.5. Routine or non-hostile (blue on blue) Interference. Do not report routine or non-hostile (blue on blue) interference beyond the FCAC. FCAC will forward the report to the 30 SW SMO. Exceptions will be those incidents determined by the 30 SW SMO or 30 SW Command Post to be of informational value to the 30SW or Command Staff.

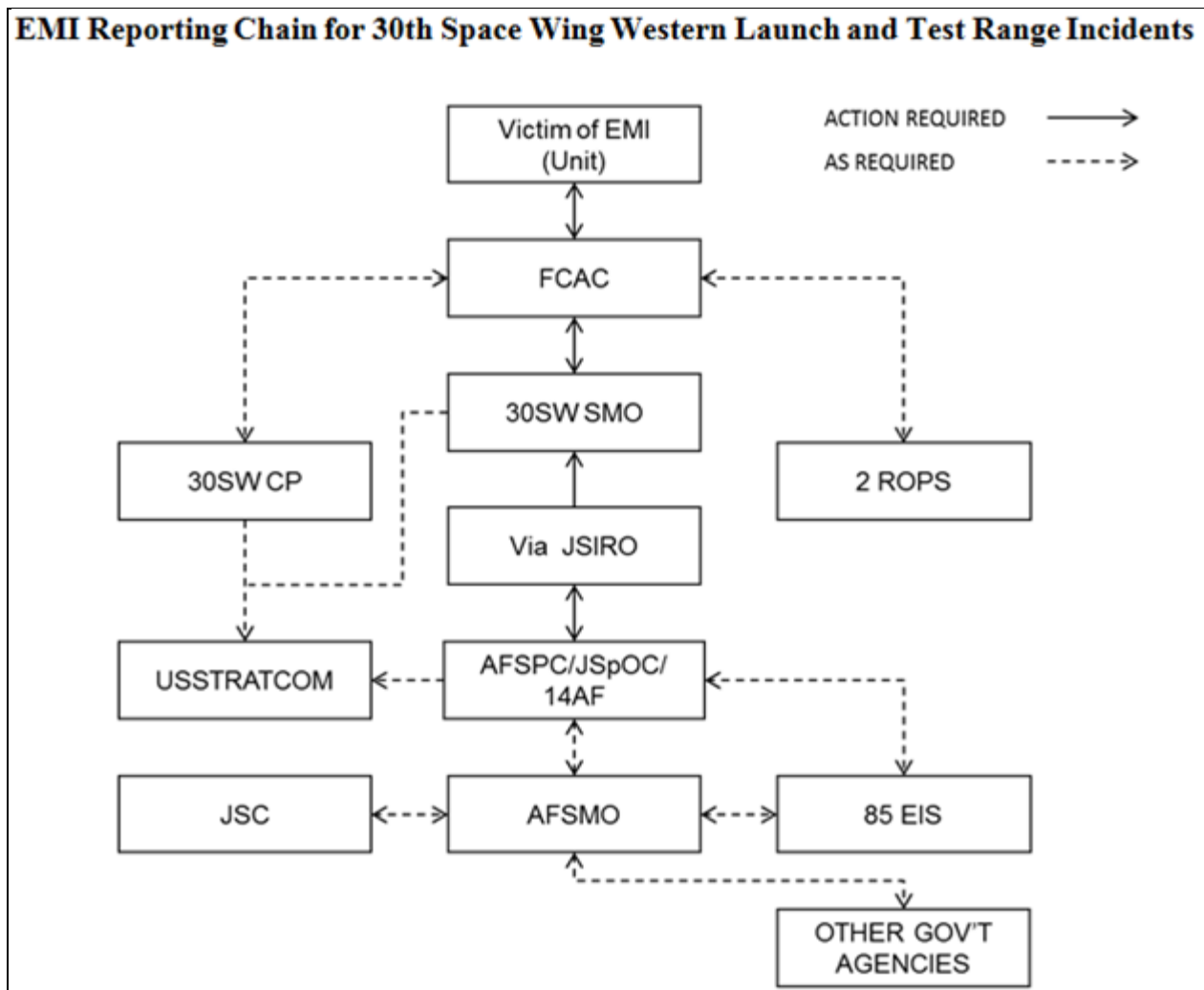
3.8.6. Public or Private Civilian Community EMI/EMC Complaints. Public or private civil community EMI/EMC complaints will be investigated by direction of the 30 SW/CC. Normal procedure is to refer received complaints through Public Affairs to the 30 SW/CC and 30 SCS/CC. If the investigation proves culpability by Government systems, either licensed or unlicensed, the offending system will be immediately turned off (secured) until cause and effects may be determined. Investigators are not to publicly comment to particulars regarding the issue. Investigative responses are routed through the Wing staff for public release.

3.8.7. Follow-up Reports. Follow-up reports will be submitted, as required, when information becomes available from the investigation team. The initial investigation team will primarily be FCAC, FMS, RF Lab and the 30 SW SMO.

3.8.8. Final Reports. After exhausting all local resolution efforts, or upon resolution of the EMI, a final report will be submitted to AFSPC. AFSPC will provide extended support or the official Final/Closing report, with a copy to the 30 SW SMO. The 30 SW SMO will inform the victim of the outcome.

3.8.9. Unresolved Interference. Unresolved interference from other DOD service or Inter-base activities, and/or encroachment by U.S. civilian (FCC licensed, unlicensed, or amateur), or foreign civil systems, will also be reported to HQ AFSPC for coordination with the HQ USAF, the Office of the Secretary of Defense, the FCC or the U. S. Department of State (as applicable).

Figure 1. EMI Reporting Chain for 30 SW.



3.9. Cease Transmission Order. All operators of RF transmitters (government, non-government, private, commercial) operating under 30 SW authority must cease RF transmission immediately when specifically directed to do so by the 30 SW SMO or the

FCAC. Such actions may be necessary to resolve interference or radiation hazard problems. Prompt compliance with a Cease Transmission order is a condition for continued authorization to conduct business on or within 30 SW assets or facilities.

3.10. Frequency Coordination Requirements Outside of the 30 SW. Any activity anticipating a need for coordination with a non-range agency concerning RF matters must contact the 30 SW SMO. The 30 SW SMO provides or performs all such coordination necessary to prevent or resolve frequency problems. This focal point for base internal or external frequency coordination is mandatory and is the only way of ensuring appropriate technical responses, preventing redundant or conflicting positions, and maintaining good relationships and credibility.

3.11. Cellular Tower Siting. The siting location of cellular service towers will be in compliance with current 30 SW policies, procedures and instructions.

J. CHRISTOPHER MOSS, Colonel, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

30 SWI 13-203, *Western Range Scheduling*, 26 August 2009

AFSPCMAN 91-710 Vol 3, *Range Safety User Requirements Manual Volume 3 – Launch Vehicles, Payloads, and Ground Support Systems Requirements*, 1 July 2004, Certified Current 4 January 2011

AFSCMAN 91-711, *Launch Safety Requirements for Air Force Space Command Organizations*, 1 February 2007

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

AFI 10-707_AFSPCSUP, *Spectrum Interference Resolution Program*, 17 November 2006

AFI 33-580, *Spectrum Management*, 17 January 2013

AFI 48-109, *Electromagnetic Field Radiation (EMFR) Occupational and Environmental Health Program*, 1 August 2014

AFI 99-103, *Capabilities-Based Test and Evaluation*, 16 October 2013

AFMAN 63-119, *Certification of System Readiness for Dedicated Operational Test and Evaluation*, 20 June 2008

DODI 3222.03, *DOD Electromagnetic Environmental Effects (E3) Program*, 12 August 2014

DODI 4650.01, *Policy and Procedures for Management and Use of Electromagnetic Spectrum*, 9 January 2009

DODI 5000.02, *Operation of the Defense Acquisition System*, 07 January 2015

NTIA Manual, Chapter 8.3.28, May 2014 revision

47 CFR, *Code of Federal Regulations, Telecommunication*, 1 October 2008

47 CFR, *Code of Federal Regulations, Telecommunication*, FCC 13-21 Report and Order, 20 February 2013

USSTRATCOM SD 710-4, *Satellite Communications (SATCOM) Electromagnetic Interference (EMI) Resolution Procedures*, 22 February 2005

Adopted Forms

DD Form 1494, *Application for Frequency Allocation*

AF Form 332, *Base Civil Engineer Work Request*

AF Form 813, *Environmental Impact Analysis*

Abbreviations and Acronyms

2ROPS/DOF—2d Range Operations Squadron/Program Support Office

2ROPS/DOS —2d Range Operations Squadron/Scheduling Office

30SW—30th Space Wing
AFSMO—Air Force Spectrum Management Office
AFI—Air Force Instruction
AFMAN—Air Force Manual
AFSCN—Air Force Satellite Control Network
AFSPC—Air Force Space Command
ATC—Air Traffic Control
30 SCS—30th Space Communications Squadron
DAG—Defense Acquisition Guidebook
DFS—Dynamic Frequency Selection
DOD—Department of Defense
DODI—Department of Defense Instruction
EIRP—Effective Isotropic Radiated Power
EMI—Electromagnetic Interference
FCAC—Frequency Control & Analysis Center
FCC—Federal Communications Commission
FRRS—Frequency Resource Record System
GHz—Gigahertz
GMF—Government Master File
GPS—Global Positioning System
IAW—In Accordance With
ISM—Installation Spectrum Manager
JFP—Joint Frequency Panel
JSIR—Joint Spectrum Interference Resolution
JSpOC—Joint Space Operations Center
LAN—Local Area Network
LTRS—Launch and Test Range System
LISC—LTRS Integrated Support Contract (LISC)
MHz—Megahertz
NASA—National Aeronautics and Space Administration
NTIA—National Telecommunications and Information Administration
OD—Operations Directive

OPSEC—Operations Security
PCS—Personal Communication System
PDA—Personal Data Assistant
POC—Point of Contact
PWCS—Personal Wireless Communication Systems
rms—root mean square
RF—Radio Frequency
RFMC—Radio Frequency Measurements Center
RNSS—Radio Navigation Satellite Service
SATCOM—Satellite Communications
SIPRNET—Secure Internet Protocol Network
SIRF—Spectrum Interference Resolution Format
SMO—Spectrum Management Office
SOPS—Space Operations Squadron
STE—Secure Terminal Equipment
STU III—Secure Telephone Unit
SUP—Supplement
TPC—Transmitter Power Control
UDS—Universal Documentation System
U-NII— Unlicensed – National Information Infrastructure
USSTRATCOM—United States Strategic Command

Terms

Amended Initial EMI Report —Updated Initial EMI Report which is submitted by AFSPC SMO as a JSIR report.

Closed EMI Report — The status of this report is one that is either resolved (final report) or all attempts to resolve the EMI have been exhausted. Reports are closed by the AFSPC Command SMO.

Closed loop RF System —Suppression of electromagnetic radiation to acceptable levels which will permit simultaneous open and closed loop operations with assurance that data values at each interface point are agreeable with the transmission media used and that the data is not degraded at the interface point.

Consumer Signal Boosters —Devices that are marketed to and sold for personal use by individuals. Consumer Signal Boosters must include specific technical features, be appropriately labeled, have some form of provider consent prior to consumer use, and be accurately registered with the consumer’s wireless provider. Consumer Signal Boosters can be designed to cover

multiple wireless providers (Wideband Consumer Signal Boosters) or a single provider (Provider-Specific Consumer Signal Booster). Consumer Signal Boosters are designed to operate in a fixed location in a building.

Dynamic Frequency Selection (DFS) —DFS dynamically instructs a transmitter to switch to another channel whenever a particular condition (such as the presence of a radar signal) is met.

Electromagnetic Equipment —Electronic systems, equipment and devices capable of radiating RF energy, or are dependent on the successful reception of RF energy.

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

Final EMI Report —The Final EMI Report with specific details of the incident and the results of actions taken. Submitted by AFSPC SMO.

Follow-up EMI Report —An updated Amended EMI Report containing additional information of the incident submitted by the victim of the incident..

Frequency Scheduling —The approved means by which frequency assignments are used during specific periods. The scheduling is required for most range or missile systems and not for ground communications systems.

Industrial Signal Boosters —Industrial Signal Boosters are all signal boosters other than Consumer Signal Boosters. Industrial Signal Boosters are designed for installation by licensees or qualified installers. These devices may be installed only with explicit licensee consent and close licensee coordination. In addition, these devices must be appropriately labeled. Industrial Signal Boosters must be labeled to notify consumers that operation of the device requires an FCC license or express (*i.e.*, individualized) consent of the licensee whose signals are intended to be amplified by the device.

Initial EMI Report —The first report submitted by the victim of the interference to the FCAC and 30 SW SMO.

Minimal Impact —Mission can be accomplished with little effort or expenditure of resource.

Open EMI Report —Initial or Follow-up EMI Report that is still being worked or waiting for requested support to try to resolve.

Radio Frequency (RF) —includes the electromagnetic spectrum from 3 KHz to 300 GHz.

RF Allocation —Designation of a portion of the RF spectrum to accommodate operations of electromagnetic equipment (not a license to operate)

RF Assignment —Designation of specific frequency, group of frequencies, or frequency band for operational or test purposes (the license).

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

RF Spectrum Manager —Person designated by the 30 SW/CC who exercises frequency management for and in coordination with, all units on VAFB and other 30 SW operating locations.

Routine or "Non-Hostile" Interference —Electromagnetic interference caused by another system supporting the same mission or interference from atmospheric, mechanical, internal component, etc. conditions.

Severe Impact —Mission cannot effectively be accomplished when EMI is present.

Signal Booster —These devices provide improved wireless coverage. Signal boosters are classified into two distinct, straight-forward categories: Consumer Signal Boosters and Industrial Signal Boosters.

Significant Impact —Mission capability is reduced but can still be accomplished. This implies the need to use available spares, reduced sensitivity, reduced automation, or other expenditure of resources to mitigate the effects of the EMI.

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

Transmitter Power Control (TPC) —TPC allows the Access Point (AP) to negotiate power levels with a WLAN client during that association process.

Unlicensed —National Information Infrastructure (U-NII)— The 5 GHz band which is divided into several different sections or bands. Each of the Unlicensed National Information Infrastructure (UNII) bands was originally intended for different uses. Initially, the FCC defined only the UNII-1, UNII-2, and UNII-3 bands. Recently the UNII was expanded to include UNII-4. There are differing limitations on these UNII bands. Restrictions vary between them for transmit power, antenna gain, antenna styles, and usage.

Wireless Modem/Router —A device that uses radio frequencies to provide a two-way wireless path or gateway between a computer and a Cellular Service Provider. It uses the Cellular Service Provider's licensed frequencies. These are considered Part 15 devices. Similar to a Novatel wireless router (MiFi) or the data side of a smartphone.

Wireless Local Area Network (WLAN)/WiFi —A device that uses radio frequencies to provide a two-way wireless path or gateway between computers and an Internet Service Provider (ISP) using the ISP's licensed frequencies. These are considered Part 15 devices that fall under the IEEE 802.11 protocol.

Attachment 2

ORGANIZATION POINT OF CONTACT REFERENCE TABLE**Table A2.1. Organization Point of Contact Reference Table.**

ORGANIZATION	OFFICE CODE	COMM PHONE NO.	DSN PONE NO.
30 SW SPECTRUM MANAGEMENT OFFICE	30 SCS/SCORF	805-605-3660 805-606-6695	275-3660 276-6695
2 ROPS SCHEDULING OFFICE	2 ROPS/DOS	805-606-8825	275-8825
2 ROPS RANGE PROGRAM SUPPORT OFFICE	2 ROPS/DOF	805-606-3953	276-3953
30 MDOS BIOENVIRONMENTAL ENGINEERING ELEMENT	30 MDOS/SGOJ	805-606-7811	276-7811
LISC (Range) FCAC	FCAC	805 606-9247	276-9247
30 SW COMMAND POST	30 SW/CP	805-606-9961, 9962, 9963	276-9961, 9962, 9963

Attachment 3

SPECTRUM INTERFERENCE REPORT FORMAT (SIRF) FOR THE RANGES

Figure A3.1. Spectrum Interference Report Format (SIRF) For The Ranges

Classification

(EMI report SIPRNET address elements as a minimum)

TO: JSPOC

AFSPC COMMAND CENTER

INFO: 30 SW or 45 SW WING OPERATIONS

CDRJSO

AFSPC/A6NII

30 SW/45 SW (INTEL)

30 SW/45 SW (Frequency Management Offices)

Subject: Initial or Follow-Up EMI Report

1. Receiver affected: Center frequency of victim receiver in MHz.
2. Location and coordinates: Name of base, town, etc. & coordinates in degrees, minutes and seconds using the 0 – 180-degree basis, e.g., 180W/180E.
3. Persistence of interference: How often, intermittent or continuous?
4. Zulu date/time of interference: Interference start and end times. If interference is still present at time of report, identify as 24 Jan 07/1412Z to present.
5. System name effected: (AN/FPQ-14 Radar)
6. Current mission impact: (See Attachment 1—*Terms* for mission impact definitions) – (e.g. Significant Impact – Lost track. Re-acquired vehicle by increasing power. What radar performance was lost as a result of action(s) taken?)
7. Potential impact to users if interference continues: Possible cancellation of launches and associated costs.
8. Antenna azimuth & elevation at time of EMI: Direction in degrees from where the EMI is coming from.
9. EMI indication: What evidence did/do you have that indicated you had/have and EMI event?
10. EMI snapshot: Photo/screen shot is/is not available.
11. Contacts: Those organizations contacted by the operator to try to identify the interference source and their responses, e.g., FCC, FAA
12. General information about the interference: Whatever information is available that may help in the investigation, e.g., center frequency of interfering source appears to be on _____MHz, with a _____ MHz bandwidth.
13. Current resolution actions: E.g., Awaiting results of trouble shooting, headquarters assistance, none – Interference no longer present.
14. Contact information: 30 SW Duty Officer submitting the report and a secure telephone number, i.e. STE/STU III.
15. Classification: Use the system's security classification guide.