



DEPARTMENT OF THE AIR FORCE
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MEMORANDUM FOR DISTRIBUTION C
MAJCOMs/FOAs/DRUs

FROM: SAF/CIO A6
1800 Air Force Pentagon
Washington, DC 20330-1800

SUBJECT: Air Force Guidance Memorandum to AFI 10-707, *Spectrum Interference Resolution Program*

By Order of the Secretary of the Air Force, this Air Force Guidance Memorandum immediately changes Air Force Instruction 10-707, *Spectrum Interference Resolution Program*, 20 Jun 2005. Compliance with this Memorandum is mandatory. To the extent its directions are inconsistent with other Air Force publications, the information herein prevails, in accordance with (IAW) AFI 33-360, *Publications and Forms Management*. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS).

As a result of the publication of AF Policy Directive (AFPD) 17-2, *Cyberspace Operations*, which supersedes AFPD 10-17, *Cyberspace Operations*, dated 31 July 2012; AFI 10-707 is hereby renumbered as AFI 17-221. This Memorandum is a renumbering of AFI 10-707 only; the title and content remain unchanged. I hereby direct the Office of Primary Responsibility (OPR) for AFI10-707 to conduct a special review in accordance with AFI33-360 to align its content with AFPD17-2. This will result in a rewrite or rescind action of AFI10-707.

This Memorandum becomes void after one year has elapsed from the date of this Memorandum, or upon rescinding or rewrite of AFI10-707, whichever is earlier.

WILLIAM J. BENDER, Lt Gen, USAF
Chief of Information Dominance and Chief
Information Officer

**BY ORDER OF THE SECRETARY
OF THE AIR FORCE**

AIR FORCE INSTRUCTION 10-707

22 DECEMBER 2015



Operations

**SPECTRUM INTERFERENCE
RESOLUTION PROGRAM**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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(Mr. Peter Kim)

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Pages: 15

This instruction implements AFPD 10-7, *Information Operations*, and describes the US Air Force Spectrum Interference Resolution (AFSIR) Program. Provides Military Department guidance in accordance with Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3320.02, *Joint Spectrum Interference Resolution (JSIR)*, CJCSI 3320.02D-1, *Classified Supplement to Joint Spectrum Interference Resolution (JSIR)*, and Chairman Joint Chiefs of Staff Manual (CJCSM) 3320.02, *Joint Spectrum Interference Resolution (JSIR) Procedures*. Provides guidance for reporting, identifying, evaluating, and controlling electromagnetic interference (EMI) to meet electromagnetic compatibility (EMC) goals of the DoD Electromagnetic Environmental Effects (E3) program as defined in Department of Defense Instruction (DoDI) 3222.03, *DOD Electromagnetic Environmental Effects (E3) Program*. And also provides guidance for requesting Quick Fix Interference Resolution Capability (QFIRC) and related EMC measurements and specialized engineering services. This publication applies to the Regular Air Force, Air National Guard (ANG), and Air Force Reserve. Major commands (MAJCOM), ANG, field operating agencies (FOA), and direct reporting units (DRU) may develop additional procedures for implementing this instruction, but all supplements must be routed to the OPR of this publication for coordination prior to certification and approval. Refer technical questions about this publication to the Air Force Spectrum Management Office (AFSMO), 6910 Cooper Avenue, Ft Meade, MD 20755-7088. The reporting requirements in this publication (para 3.6) are exempt from licensing in accordance with AFI 33-324, *The Air Force Information Collections and Reports Management Program*. Refer recommended changes and technical questions about this publication to the Air Force Spectrum Management Office (AFSMO/SQ), 6910 Cooper Avenue, Ft Meade, MD 20755-7088, using AF Form 847, *Recommendation for*

Change of Publication; route AF Forms 847 through the appropriate functional chain of command. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, Table 1.1 for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternatively, to the Publication OPR for non-tiered compliance items. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed in accordance with Air Force Web-RIMS Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afrims/afrims/afrims/rims.cfm>. Refer to **Attachment 1** for a glossary of references and supporting information.

SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. Major changes include: interference resolution information and laser reporting IAW Joint Staff guidance, interference resolution checklist, and updated reporting format for interference incidents.

1. Air Force Spectrum Interference Resolution (AFSIR) Program. CJCSI 3320.02 states DOD components will attempt to resolve interference affecting systems under their auspices at the lowest level possible within their chain of command. The AFSIR program pertains to Air Force units experiencing interference at any time except when under the operational control of a Combatant Command. MAJCOMs with units located outside of the continental United States may report and resolve interference in accordance with geographical Unified Command procedures and can request AFSMO or QFIRC assistance, if needed. Report any Air Force interference experienced while supporting joint operations in accordance with Joint Task Force or Combatant Command procedures. Interference to space systems, including space, ground, and control segments shall be reported to your MAJCOM, in accordance with Air Force Space Command (AFSPC) supplemental guidance. (T-1) The focus of the AFSIR program is to resolve EMI at the lowest organizational level. Submit all reports, initial, follow-on, and closure through the MAJCOM to AFSMO.

2. Electromagnetic Interference (EMI). EMI can be caused by enemy, neutral, friendly, or natural sources, and must be resolved on a case-by-case basis. Users must investigate and report as outlined in paragraph 3. (T-1)

2.1. EMI from DOD Users. When the EMI clearly results from another DOD user, attempt to resolve the interference at the lowest organizational level. After all local efforts have been exhausted to resolve the EMI, request assistance through command frequency management channels. Within their area of responsibility, installation commanders and DoD AFCs have the authority to implement radio silence/Cease Buzzer procedures for a suspected interfering activity until the interference issue can be resolved.

2.2. EMI from Non-DOD Users. Request assistance through command frequency management channels. Do not go directly to the Federal Communications Commission (FCC) or any other agency. AFSMO will coordinate with the FCC and other government agencies at the national level if the investigation shows that non-Air Force equipment caused

the EMI. Within their AOR, DoD AFCs are authorized to locally coordinate with any federal or non-federal agency to resolve interference at the lowest level possible.

2.3. EMI from suspected hostile sources. The primary difference between hostile and non-hostile EMI is intent. In a non-operational environment, all incidents should initially be treated as non-hostile EMI until proven otherwise. EMI occurring in an operational environment is to be considered hostile until a determination can be made as to the source of the problem. EMI from hostile sources should be reported to the Joint Spectrum Center (JSC) IAW CJCSI 3320.02. Military Satellite Communications incidents will be handled in accordance with the procedures outlined in CJCSM 3320.02 and SI 714.04, Satellite Communications.

3. Electromagnetic Interference (EMI) Resolution.

3.1. The victim of the interference will contact the local installation spectrum manager (ISM) or other point of contact identified by the higher headquarters. The following actions should be initiated/accomplished prior to the requesting assistance from the higher headquarters spectrum manager per paragraph 3.2. (T-2)

3.1.1. System operator will contact equipment maintenance personnel to determine if the EMI is the result of maintenance actions or an equipment malfunction. (T-2)

3.1.2. System operator will contact other known nearby units to ascertain if they are experiencing the same type of EMI. This may aid in identifying the interference source. (T-2)

3.1.3. When co-channel interference (interference between systems assigned similar frequency assignments) is suspected, the ISM will attempt to determine the location of frequency assignments that fall within the bandwidth of the victim receiver. (T-2)

3.1.4. If resources are available, system operations and equipment maintenance personnel will attempt to determine the bandwidth, relative amplitude, and modulation of the EMI with a spectrum analyzer. (T-2) Find the approximate bandwidth by varying the receiver frequency to determine the affected frequency band.

3.1.5. After exhausting all local resolution efforts, the ISM or MAJCOM Spectrum Management Office (SMO) can contact the 85th EIS (AFSPC) located at Keesler AFB MS directly for an initial assessment of the problem, obtain consultation, and recommendations regarding actions, coordination and techniques that can be used to identify the source and resolve the EMI. (T-2)

3.2. If resolution is not obtained in accordance with paragraph 3.1., the ISM will request assistance from the higher headquarters spectrum manager. (T-3) The higher headquarters spectrum manager should use any additional information and tools available to resolve the EMI and should request a report as outlined in paragraph 3.6.

3.3. If the MAJCOM spectrum manager cannot resolve the EMI, notify AFSMO and the 85th EIS for assistance. (T-2)

3.4. If resolution is not achieved in accordance with paragraph 3.3., a QFIRC may be required. Coordinate approval between MAJCOM SMO and 85th EIS. TDY funds for QFIRC support is typically provided by the requesting organization. Organizations will need

to consider avenues to expedite funding with the 85th EIS based on the level of EMI and impact to operations.

3.5. AFSMO can also request national-level federal agency and/or JSC support, as appropriate. (T-2)

3.6. EMI Reporting:

3.6.1. Report Precedence. The ISM and MAJCOM SMO will determine precedence consistent with the urgency of the reported situation. If EMI is suspected to be intrusion, or jamming, it should be reported immediately. All other EMI events should be reported within two hours of the start of the event. (T-2)

3.6.2. Security Classification of EMI Reports. Units must evaluate the security sensitivity of the EMI on the affected system and classify the report accordingly. (T-1) Security classification of interference incidents/reports is determined principally by nationality and location of the implied or stated source of the interference and the security sensitivity of the affected military system. Stations located in combat areas or having a sensitive military mission generally must classify all interference reports. Guidelines for classifying interference incidents are contained in CJCSI 3320.02.

3.6.3. Report Format. EMI incidents shall be entered into the JSIROOnline (JSIRO) collaboration portal while resolution using local organic assets or host nation assistance is pursued. (T-2). Entering the incident in the JSIRO collaboration portal only provides situational awareness. It does not generate a request for technical support. The JSIRO collaboration portal is located on the Secure Internet Protocol Router Network (SIPRNet) at <http://intelshare.intelink.sgov.gov/sites/jsir/default.aspx>. All spectrum managers involved with EMI resolution will ensure they have proper access and permissions to access the JSIRO portal to be able to establish alerts and to be able to edit and maintain reports. As an alternative method of reporting, AFSIR reports can be reported by electronic means (e-mail). See Attachment 3 for Offline Report Format.

3.6.4. Report Addresses.

3.6.4.1. Air Force units submitting email notification of JSIRO reports or offline AFSIR reports through their chain of command to their higher headquarters (Wing, NAF, Command SMOs) as the action addressee, will provide an info copy to AFSMO NIPRNET: afsmocworkflow@us.af.mil or SIPRNET usaf.jbanafw.afsmo-mla-do-list@mail.smil.mil and 85th EIS NIPRNET: 85eis.scym.1@us.af.mil and 85eis.scx.1@us.af.mil or SIPRNET 85eis.scy@aetc.af.smil.mil.

3.6.4.2. MAJCOMs submitting offline reports to AFSMO NIPRNET afsmo.doo@us.af.mil or SIPRNET afsmo.doo@af.pentagon.smil.mil and the 85th EIS NIPRNET 85eis.scym.1@us.af.mil and 85eis.scx.1@us.af.mil or SIPRNET usaf.keesler.81-tw.mbx.85-eis-scy as the action addressee with an info copy to JSC NIPRNET disa.sosc@mail.mil or SIPRNETdisa.sosc@mail.smil.mil. All requests for JSC support will be coordinated through AFSMO/SQ. (T-2).

3.6.5. Exercise Interference. During exercise periods, coordinate all EMI reports with the Electronic Warfare Cell in the Air Operations Center or EW Duty Officer. Do not submit

an exercise-related report if jamming or intrusion activities are authorized during an exercise and determined to be the source of interference. Depending on geographical location, contact the appropriate Range Spectrum Manager or DoD Area Frequency Coordinator to determine if the interference is an approved part of the exercise.

3.6.6. Exceptions to Reporting. Do not report an incident when: (T-3)

3.6.6.1. The interference is transient EMI from natural sources (e.g., rain, lightning, etc.).

3.6.6.2. The interference only affects training frequencies assigned on a noninterference basis for training purposes.

3.6.6.3. Space weather (e.g., HF fades, Polar Cap Absorption (PCA) events, geomagnetic storming, etc.) is the suspected, or confirmed, cause of the interference. For assistance, notify the local weather unit of the EMI to include date, time, location, system, and frequency impacts. The local weather unit can contact the Air Force Weather Agency, as appropriate.

3.6.6.4. The interference is only experienced aboard intelligence, surveillance and reconnaissance (ISR) aircraft aloft and is localized when mission equipment or payload equipment is turned on/off or used. In these cases, the interference must be reported to the flying unit's Director of Maintenance/Maintenance Officer and Director of Operations. The unit's Director of Maintenance/Maintenance Officer may report the EMI to AFMC; the flying unit's Director of Operations must characterize the operational impact. The unit's Director of Maintenance/ Maintenance Officer must determine if unit maintenance or calibration will resolve the EMI before notifying AFMC. If notified, AFMC must determine if any field or depot upgrades meant to resolve the EMI are already scheduled. AFMC is responsible for reporting the EMI to AFSMO if the EMI can be detected at a distance of more than 50 meters from the aircraft.

3.7. Laser Event Reporting. IAW with CJCSM 3320.02, the National Air & Space Intelligence Center (NASIC) will collect and maintain data on laser events against air, ground, and naval assets to include personnel. Data collection on laser events is necessary to understand the nature of the threat and to develop countermeasures. Air Force units will report laser events against air/ground assets and personnel through a reporting process using the following SIPRNET link: <http://www.naic.wrightpatterson.af.smil.mil/DEW/gliderr> or <http://www.naic.ic.gov/dew/le.shtml> on the Joint Worldwide Intelligence Communications System (JWICS). (T-2) Listings of previous events can be accessed at either <http://www.naic.wrightpatterson.af.smil.mil/DEW/glider> AF units may call the NAIC and Avionics Directed Energy Branch (NAIC/ADEE) with questions at the following numbers: Commercial 937-522-4820/4818/4885/4817 or DSN: 672-4820/4818/4885/4817.

4. Requesting Quick Fix Interference Reduction Capability (QFIRC) and JSC Assistance:

4.1. QFIRC. The QFIRC reduces or eliminates unintentional (non-hostile) EMI associated with Air Force operational equipment. The QFIRC service analyzes and recommends corrective actions for reported EMI problems. The 85th EIS provides QFIRC to all Air Force units. This unit can provide people and equipment to perform on-site direction finding and interference problem analysis. The 85th EIS will document corrective actions and give

recommendations for solving EMI problems in a formal report that will be forwarded to the requesting unit and to its parent MAJCOM and AFSMO. QFRIC assistance must be coordinated through the involved MAJCOM spectrum management channels. (T-2)

4.2. JSC. The JSC maintains a central database of EMI cases, resolutions, and lessons learned for all DoD EMI and provides analytical and on-site assistance in resolving EMI problems. The JSC assistance will be requested by AFSMO after all Air Force resources are exhausted.

5. Roles and Responsibilities.

5.1. Director, Joint Spectrum Center (JSC):

5.1.1. Manages the DoD JSIR program and the JSIR collaboration portal IAW guidance from the Department of Defense CIO and the Joint Staff, Director for Command, Control, Communications, and Computers/Cyber (C4) (J-6). Maintains the DoD interference database and status tracking, to include EMI characteristics and methods of resolution for each EMI case reported and provides database access to Air Force units upon request.

5.1.2. Upon request, assists in the resolution of EMI. If on-site assistance is necessary, the request must be initiated by AFSMO. (T-2)

5.2. Deputy Chief of Staff for Air and Space Operations (AF/A3I) will:

5.2.1. Monitor and suggest countermeasures, when applicable. (T-2)

5.2.2. In conjunction with AFSMO, assist in the resolution of operational frequency deconfliction issues. (T-2)

5.3. Commander, Air Force Spectrum Management Office (AFSMO) will:

5.3.1. Act as the Air Force focal point for Spectrum Interference Program and EMI resolution guidance.

5.3.2. Coordinate all policy and instructional guidance with AF/A3I. (T-2)

5.3.3. Act as the focal point for EMI problems when the proposed solution involves changes in frequency assignments. (T-2)

5.3.4. Submit U.S./Canada and U.S./Mexico radio interference reports as directed in the National Telecommunications and Information Administration (NTIA) Manual of Regulations and Procedures for Federal Radio Frequency Management. (T-0)

5.4. Commander, Air Force Materiel Command (AFMC) and Commander, AFSPC Space and Missile Systems Center (SMC) will:

5.4.1. Review and coordinate EMC standards with other agencies, in addition to developing military EMC standards and specifications for the design, development, procurement, production, test, and measurement of electrical, electronic, and telecommunication equipment. (T-2)

5.4.2. Design equipment for maximum suppression of undesirable emissions and optimum rejection of potential EMI. (T-2)

5.4.3. Conduct EMI studies and analyses to ensure that equipment in the design or development stages will meet or exceed established specifications and standards and achieve EMC in its intended operational environment. (T-2)

5.4.4. Provide funds for managing and procuring common test equipment required to support EMI reduction efforts and centrally procured QFIRC items. (T-2)

5.4.5. Notify AF/A3I and SAF/AQI if the EMI is experienced aboard an ISR aircraft and the EMI is caused by mission equipment or payload equipment aboard the aircraft. Notify AFSMO of the EMI if the EMI can be detected off-board (more than 50 meters from the aircraft).

5.5. Commander, 85th EIS will:

5.5.1. Act as the technical focal point for the QFIRC and EMC/EMI measurements. (T-2)

5.5.2. Maintain an EMC office to analyze programs for electronic facilities, identify EMI problems and where possible, make or recommend planning adjustments to eliminate or reduce EMI problems. (T-2)

5.5.3. Establish and maintain the QFIRC program for the Air Force. (T-2) QFIRC services include:

5.5.3.1. Receive and analyze reports of EMI to operational equipment and systems and providing technical assistance when requested. Technical assistance will include, electromagnetic environmental effects (EME) studies, EMC and EMI consultation, on-site interference investigations including direction-finding measurements to locate the source(s) of EMI, as well as initiating and recommending corrective actions to resolve EMI problems.

5.5.3.2. Procure and maintain reasonable quantities of interference reduction devices to resolve operational EMI problems. Items will be provided directly to the unit experiencing EMI when the items will be effective in reducing or eliminating the EMI problem.

5.5.3.3. Advise all working levels of the other military Services, nonmilitary government agencies, and civilian users of electronic equipment, both domestic and foreign, on methods to eliminate or reduce EMI problems, where Air Force equipment is involved.

5.5.3.4. Upon request, provide technical advice and measurement assistance to AFSMO and MAJCOMs on EMI problems during equipment and systems acquisition. The requesting organization normally funds assistance. If funds are not available, the requesting organization will need to address funding through their higher headquarters.

5.5.3.5. Advise HQ AFMC and SMC/ENC of EMI trends or developments that require changes in maintenance procedures, requirements for new equipment, or modifications to present equipment.

5.5.3.6. Review and coordinate on EMC standards, as necessary, with other agencies and assist HQ AFMC and SMC/ENC in the development of adequate and useful

military standards and specifications for the design, development, procurement, production, test and measurement of electro-magnetic spectrum-dependent equipment.

5.5.3.7. Provide Air Force activities with measurement services to analyze and resolve EMI problems. These services include prototyping and testing various configurations of equipment to determine the best installation criteria when parameters cannot be obtained from equipment design specifications or available test data.

5.5.3.8. Procure, develop, and employ reliable and accurate measurement techniques and equipment with the sensitivity, accuracy, range, and stability necessary to provide valid electromagnetic measurement data on Air Force electronic equipment and systems to evaluate EMI and EMC, and providing measurements and specialized engineering services as outlined in this instruction.

5.5.3.9. Maintain an online reference library of technical information on actions taken to resolve EMI problems, and provide available information to the JSC to be included in the JSIR database.

5.5.3.10. Publish a user/maintainer technical guide for resolving EMI at the local level.

5.6. MAJCOM, FOA, and DRU commanders/directors will:

5.6.1. Adhere to the policy of the AFSIR program.

5.6.2. Identify EMI and EMC requirements and request the appropriate technical assistance to perform the required analysis, measurements and evaluations.

5.6.3. Ensure a valid radio frequency authorization has been obtained from an appropriate authority to control potential EMI before installing new or modifying equipment. (T-0)

5.6.4. Ensure maintenance and operations personnel and activities are operating within prescribed parameters of their frequency assignment to minimize EMI during operational use of equipment. (T-2)

5.6.5. Ensure that off-the-shelf and locally procured and leased equipment are designed to suppress or reject EMI.

5.6.6. Supplement this instruction, as necessary, or provide a policy letter to establish reporting channels and OPRs at each level of command. Supplements must not impede the reporting of EMI or restrict the direct communication of policy between subordinate units and Air Force engineering agencies that provide QFIRC consulting and technical support, measurements and specialized engineering services. Coordinate command supplements with AFSMO and send a copy to the 85th EIS/SCY, 670 Maltby Hall Drive, Ste 234, Keesler AFB MS 39534-2633.

5.6.7. Provide a command point of contact for EMI and EMC to the 85th EIS. (T-2)

5.6.8. Ensure that EMI is reported in accordance with the EMI reporting policy and procedures.

- 5.6.9. Establish training to ensure personnel are familiar with this instruction, procedures for reporting EMI and requesting assistance when needed. (T-2)
 - 5.6.10. Develop EMI education programs tailored to their mission and equipment.
 - 5.6.11. Assist subordinate units in identifying, resolving and reporting EMI.
 - 5.6.12. Determine the registration priority of the frequencies involved in an EMI problem.
 - 5.6.13. Resolve EMI resulting from frequency assignment problems through negotiations with MAJCOMs, other agencies and foreign countries, through the appropriate Combatant Command, as required.
 - 5.6.14. Ensure that EMC requirements are considered before assigning frequencies.
 - 5.6.15. Coordinate actions to resolve EMI.
- 5.7. Installation Spectrum Managers (ISMs) will:
- 5.7.1. Implement a base-level interference resolution program using the guidance contained in this AFI and provided by the respective MAJCOM or NAF as applicable. (T-2)
 - 5.7.2. Maintain a list of point of contacts for all units and organizations on the installation operating spectrum dependent equipment. (T-2)
 - 5.7.3. With assistance from the higher headquarters, develop a spectrum interference resolution training program for all installation spectrum users on all aspects of documenting, analyzing, and reporting.
 - 5.7.4. Assist all victims/users in the completion of the actions noted in Attachment 2 and prescribed offline reporting format and submission channels contained Attachment 3.
 - 5.7.5. Ensure victim system is operating with a valid frequency assignment and within the specified technical parameters of the assignment. (T-0)
 - 5.7.6. Coordinate all QFRIC assistance request through MAJCOM spectrum management channels.

WILLIAM J. BENDER, Lt Gen, USAF
Chief, Information Dominance and
Chief Information Officer

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

DODI 3222.03, *DOD Electromagnetic Environmental Effects (E3) Program*, Change 1, 8 January 2015

CJCSI 3320.02F, *Joint Spectrum Interference Resolution (JSIR)*, 8 March 2013

CJCSM 3320.02D, *Joint Spectrum Interference Resolution (JSIR) Procedures*, 3 June 2013
Joint Publication 1-02

Joint Publication 3-13.1, *Electronic Warfare*,

AFPD 10-7, *Information Operations*, 4 August 2014

AFI 33-324, *The Air Force Information Collections and Reports Management Program*, Change 1, 18 December 2014

AFMAN 33-363, *Management of Records*, 9 April 2015

Prescribed Forms

None

Adopted Forms

AF Form 847, Recommendation for Change of Publication

Abbreviations and Acronyms

AFSIR—Air Force Spectrum Interference Resolution Program

AFSMO—Air Force Spectrum Management Office

AFSPC—Air Force Space Command

CJCSI—Chairman Joint Chiefs of Staff instruction

CJCSM—Chairman Joint Chiefs of Staff manual

DOD—Department of Defense

DRU—direct reporting unit

E3—electromagnetic environmental effects

EIS—Engineering Installation Squadron

EMC—electromagnetic compatibility

EMI—electromagnetic interference

EW—electronic warfare

FCC—Federal Communications Commission

FOA—field operating agency

ISM—installation spectrum manager

JP—Joint Publication

JSC—Joint Spectrum Center

JSIR—joint spectrum Interference resolution

MAJCOM—major command

NTIA—National Telecommunications and Information Administration

QFIRC—quick fix interference reduction capability

RDS—records disposition schedule

Terms

Electromagnetic environmental effects (E3)—The impact of the electromagnetic environment upon the operational capability of military forces, equipment, systems, and platforms. It encompasses all electromagnetic disciplines, including electromagnetic compatibility and electromagnetic interference; electromagnetic vulnerability; electromagnetic pulse; electronic protection, hazards of electromagnetic radiation to personnel, ordnance, and volatile materials; and natural phenomena effects of lightning and precipitation static. (JP 1-02/JP 3-13.1)

Electromagnetic Compatibility (EMC)—(1) The condition that prevails when telecommunications equipment is performing its individually designed function in a common EM without causing or suffering unacceptable degradation due to unintentional EMI to or from other equipment in the same environment (NTIA). (2) DoD: The ability of systems, equipment, and devices that use the EM spectrum to operate in their intended environments without causing or suffering unacceptable or unintentional degradation because of EM radiation or response. (JP 1-02/JP 3-13.1).

Electromagnetic interference (EMI)—Any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics and electrical equipment. It can be induced intentionally, as in some forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, intermodulation products, and inadequate EMS management. (JP 3-13.1)

Attachment 2

CHECKLIST FOR EMI CHARACTERIZATION AND RESOLUTION OF EMI AT THE LOCAL LEVEL

Table A2.1. Checklist for EMI Characterization and Resolution of EMI at the Local Level

To assist users and spectrum managers at the local level, the following checklist can be used to identify and potentially resolve EMI. This checklist should be implemented prior to or in conjunction with submitting an AFSIR through the appropriate chain of command to the MAJCOM.		
STEP	ACTION	COMPLETE Y/N
1	Start a log and collect as much information about the EMI as possible.	
2	Record what interference sounds like. If appropriate measurement equipment is available, attempt should be made to quantify the characteristics of the interference signal. These characteristics include the interfering source center frequency, bandwidth, relative amplitude, modulation, direction of interference, time of occurrence, and any other characteristics that can be obtained.	
Geographical Information		
3-1	Check with other units in the geographical area to determine the area affected.	
3-2	Verify exact location of receiver using GPS, if available.	
4	Determine interference start and stop times.	
5	Have maintenance personnel: Ensure all connectors are tight. Ensure antenna cables are in good condition. Ensure equipment is operating IAW technical manual specifications and frequency assignment parameters.	
6	Verify antenna is on the correct azimuth and elevation.	
Environment Information		
7-1	Contact all nearby units to determine if there is any recently installed equipment.	
7-2	Contact the Electronic Warfare Officer (EWO) to determine if there is any local jamming or exercise occurring in the local area. If air assets are suspect, validate with spectrum analyzer and have EWO validate.	
7-3	Check with equipment and facility maintenance personnel to determine if the interference is the result of maintenance actions or an equipment malfunction. This should include non RF equipment that can cause spark-type interference used to support the operation of RF equipment (e.g., thermostat-controlled devices, electric motors, welders, etc.)	
7-4	If possible, conduct a site survey looking for other users and	

	environmental considerations that may impact affected emitter.	
7-5	Check to see if construction is being conducted in the immediate area.	
7-6	Determine whether the natural environment is the cause	
Frequency Assignment Information		
8-1	Verify through the ISM or MAJCOM spectrum management office that a valid frequency assignment authorization exists.	
8-2	If no assignment exists, cease transmission and request valid frequency.	
8-3	If valid assignment exists, change to alternate frequency and determine if interference is present.	
8-4	If a valid assignment exists and the interference goes away after changing to an alternate frequency, submit an interference report through your MAJCOM spectrum management office.	
8-5	Where co-channel or adjacent channel interference is suspected (i.e., the interfering signal overlaps the operating bandwidth of the victim receiver), check with local and area frequency management personnel to determine if other locally operated equipment has been recently assigned a co-channel/or adjacent channel frequency.	
General Characterization		
9	<p>Determine if the following are true to help characterize the interference:</p> <p>The interfering signal is encrypted.</p> <p>The interfering signal is understandable, e.g., voice.</p> <p>Note all settings (demods, bandwidths, gains, etc.) of your receiver equipment that enabled you to hear intelligible information on the interfering signal.</p> <p>The interference is due to a steady receive key indicating equipment failures, glitches, or lapses in operational discipline.</p>	

Attachment 3

OFFLINE REPORT FORMAT

Figure A3.1. Offline Report Format

Since all reported AFSIR reports should be submitted to the DoD central repository managed by the JSC (JSIRO) at <http://intelshare.intelink.sgov.gov/sites/jsir/default.aspx>, the following reporting format will be used to facilitate the process and should be reported by any electronic means possible, email being the preferred method.

All interference will be reported regardless of type, frequency, occurrences and source. This will supplement the database, which can be used to determine trends in area of interference.

SECURITY CLASSIFICATION

Subject: (Security Classification) AIR FORCE SPECTRUM INTERFERENCE RESOLUTION (AFSIR) REPORT - INITIAL, FOLLOW-UP, or FINAL

MESSAGE TEXT:

Exercise Name (if applicable)

Operation Name/Plan Originator & Number

Activity Type (contingency, exercise, or project)

Originator & Office Code/000-00// (where 000- 00 is your local tracking number)

POC/Last Name, First, Middle Initial/Grade & Title/Organization & Office Code/Street

Address/Telephone (DSN)/Telephone (Comm)/ e-mail (SIPRNET)/e-mail (NIPRNET)//24/7

POC Information.

REMARKS:**1. DESCRIPTION OF AFFECTED SYSTEM**

A. FREQUENCY(IES) AFFECTED:

B. FREQUENCY ASSIGNMENT NUMBER: The Air Force serial number or unique identification number of the frequency assignment being affected by the interference, if known.

C. NETWORK(S)/CIRCUIT(S) AFFECTED: Network circuits affected by the interference.

D. LOCATION OF SYSTEM(S): Location of system(s) affected by the interference, i.e., latitude, longitude, and site name.

E. SYSTEM AFFECTED: Include function, name, nomenclature, manufacturer with model number, or other system description. If available, include equipment characteristics of the affected receiver, such as receiver bandwidth, antenna type, antenna size, and information about any installed frequency band filters.

F. OPERATING MODE: Operating mode of the affected system, if applicable (frequency agile, pulse Doppler, search, upper/lower sideband, etc.).

G. NETWORK CONTROL STATION & PRINCIPAL USER(s) and PRIORITY NUMBER: Network control station and principal users. This information may be used to determine the priority of the restoration attempts.

H. OTHER STATIONS/UNITS EXPERIENCING INTERFERENCE:

Other stations or units affected by the interference; include geographical location, coordinates, and line-of-bearing and distance from reporting site.

2. CHARACTERIZATION OF EMI

A. **INTERFERENCE FREQUENCY, BANDWIDTH, AND SIGNAL STRENGTH:** Record the frequency and bandwidth (in kHz, MHz, etc.) at which the EMI is most apparent and the EMI signal strength (in dBm, dBW, etc.).

B. **INTERFERENCE CHARACTERISTICS:** CONTINUOUS, INTERMITTENT, RANDOM, or CHARACTERISTIC pattern; VARIED or CONSTANT amplitude; NOISE and/or PULSED. Include any other information that may assist in determining the source of the problem.

C. **PERFORMANCE EFFECTS.** Description of interference effects on performance, e.g., one or more of the following: usable or unusable, garbled, frame loss, steady receive indication (SRI), reduced range, false targets, reduced intelligibility, data errors, etc.

D. **CIRCUIT RELIABILITY:** Describe the quality of user circuit as affected by the EMI as observed through the symptoms, e.g., frequency USABLE or UNUSABLE for DATA or VOICE, GARBLED, FRAME LOSS, SRI, etc.

E. **INTERFERENCE CAUSE(S) & SOURCE(S):** For example, solar weather, atmospheric conditions, terrestrial or structural blockage, stuck carrier or cryptographic phase, another unit (include unit name, geographical coordinates, and line-of-bearing and distance from reporting site, if available).

F. **DATES AND TIMES:** Give the dates and times of the interference commencement and cessation or indicate "ongoing." Indicate whether the duration of the interference is continuous or intermittent, the approximate repetition rate of the interference, and whether the amplitude of the interference is varying or constant. Indicate if the interference is occurring at a regular or irregular time of day and if the occurrence of the interference is coincident with any ongoing local activity.

3. RESOLUTION

A. **SPECIFIC ACTIONS TAKEN TO MITIGATE, NULLIFY, IDENTIFY SOURCE(S) OF & RESOLVE INTERFERENCE:** Include clear, concise description of steps taken to mitigate or nullify, isolate source(s) of, and resolve interference. Add additional narrative of anything else known or suspected about interference that might be helpful in technical analysis. Specify whether assessment is based on technical measurement, observation, or estimation.

B. **EMI STATUS:** Indicate whether the problem has been identified and resolved.

C. **REQUEST FOR RESOLUTION ASSISTANCE:** Indicate if technical assistance is desired or anticipated; request should be directed to operational chain of command. Include recommendation for specific action.

4. **ADDITIONAL INFORMATION:** Include anything not addressed in previous paragraphs. Include declassification instructions as appropriate.