

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

**DEPARTMENT OF THE AIR FORCE
INSTRUCTION 17-221**



31 JANUARY 2023

Cyberspace

**SPECTRUM INTERFERENCE
RESOLUTION PROGRAM**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: This publication is available for downloading or ordering on the e-Publishing website at www.e-Publishing.af.mil

RELEASABILITY: There are no releasability restrictions on this publication

OPR: AF/A2/6LS

Certified by: AF/A2/6L
(Brig Gen Gavin Marks)

Supersedes: AFI17-221, 11 May 2018

Pages: 18

This instruction implements Department of the Air Force (DAF) Policy Directive 17-2, *Cyber Warfare Operations* and describes the DAF Spectrum Interference Resolution Program. It provides DAF guidance in accordance with Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3320.02F, *Joint Spectrum Interference Resolution (JSIR)*, CJCSI 3320.02E, *Classified Supplement to Joint Spectrum Interference Resolution (JSIR)*, and Chairman Joint Chiefs of Staff Manual (CJCSM) 3320.02E, *Joint Spectrum Interference Resolution (JSIR) Procedures*. It provides guidance for reporting, identifying, evaluating, and controlling electromagnetic interference (EMI) to meet electromagnetic compatibility goals of the in Department of Defense (DoD) Electromagnetic Environmental Effects (E3) program as defined in DoD Instruction (DoDI) 3222.03, *DoD Electromagnetic Environmental Effects (E3) Program*. It also provides guidance for requesting Quick Fix Interference Resolution Capability (QFIRC) and related compatibility measurements and specialized engineering services. This publication is applicable to the entire DAF, the United States Air Force (USAF), the United States Space Force (USSF), the Air Force Reserve, the Air National Guard, the Civil Air Patrol, when conducting missions as the official Air Force Auxiliary, all DAF civilian employees, and those with a contractual obligation to abide by the terms of DAF issuances. Ensure all records generated as a result of processes prescribed in this publication adhere to Air Force Instruction 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using the DAF Form 847, *Recommendation for Change of Publication*; route DAF Forms 847 from the field through the appropriate functional chain of command. This publication may be

supplemented at any level, but all supplements must be routed to the office of primary responsibility of this publication for coordination prior to certification and approval. The authorities to waive wing or 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 Department of the Air Force Manual (DAFMAN) 90-161, *Publishing Processes and Procedures*, 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 alternately to the requestor’s commander for non-tiered compliance items. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service does not imply endorsement by the DAF.

SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. Major changes include: inclusion of the USSF, current reporting procedures, and updated terms to match Joint Publication (JP) 3-85, *Joint Electromagnetic Spectrum Operations*.

1.	Overview.....	3
2.	Roles and Responsibilities.....	3
3.	EMI.....	7
4.	EMI Resolution.....	7
5.	Requesting QFIRC and JSC Assistance.....	10
	Attachment 1—GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION	11
	Attachment 2—FOR EMI CHARACTERIZATION AND RESOLUTION OF EMI AT THE LOCAL LEVEL	14
	Attachment 3—OFFLINE REPORT FORMAT	16

1. Overview. CJCSI 3320.02F, *Joint Spectrum Interference Resolution (JSIR)* states DoD components will attempt to resolve interference affecting systems under their auspices at the lowest level possible within their chain of command. The DAF Spectrum Interference Resolution program pertains to DAF units and organizations experiencing interference at any time except when under the operational control of a Combatant Command and follows the principle of attempting to resolve interference at the lowest possible level. Major Command(s) (MAJCOM(s)) and Field Command(s) (FLDCOM(s)) with units and organizations located outside of the continental United States shall report and resolve interference in accordance with the procedures of the Unified Combatant Command (CCMD) or Joint Task Force (JTF) designated that area of responsibility and may request the Air Force Spectrum Management Office (AF/A2/6LS) or QFIRC assistance, if needed. **(T-0)** Interference to space systems, including space, ground, and control segments must be reported to your MAJCOM/FLDCOM, in accordance with United States Space Command Instruction (SPI) 3250.01A, *Satellite Communications (SATCOM)*. **(T-3)** Submit all reports, initial, follow-on, and closure, through the DoD Area Frequency Coordinator (AFC) and MAJCOM/FLDCOM to AF/A2/6LS.

2. Roles and Responsibilities.

2.1. Director, Joint Spectrum Center:

2.1.1. Manages the DoD JSIR program and the JSIR collaboration portal in accordance with guidance from the DoD, Chief Information Officer, and the Joint Staff, Director for Command, Control, Communications, and Computers/Cyber (J-6). Maintains the DoD interference database and status tracking, to include characteristics and methods of resolution for each interference case reported and provides database access to DAF units upon request.

2.1.2. Upon request, assists in the resolution of EMI. If on-site assistance is necessary, the request is initiated by AF/A2/6LS.

2.2. Director, Electromagnetic Spectrum Superiority (AF/A2/6L) will:

2.2.1. Coordinate and recommend countermeasures, when applicable.

2.2.2. In conjunction with AF/A2/6LS, assist in the resolution of operational frequency deconfliction issues.

2.3. Division Chief of Air Force Spectrum Management Office (AF/A2/6LS) will:

2.3.1. Act as the DAF focal point for Spectrum Interference Program and EMI resolution guidance.

2.3.2. Coordinate all policy and instructional guidance with AF/A2/6L.

2.3.3. Act as the focal point for EMI problems when the proposed solution involves changes in frequency assignments.

2.3.4. 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*.

2.4. Commander, Air Force Materiel Command (AFMC) will:

2.4.1. Review and coordinate electromagnetic compatibility standards with other agencies, in addition to developing military compatibility standards and specifications for the design, development, procurement, production, test, and measurement of electrical, electronic, and telecommunication equipment.

2.4.2. Design equipment for maximum suppression of undesirable emissions and optimum rejection of potential EMI in accordance with requirements from the NTIA's *Manual of Regulations and Procedures for Federal Radio Frequency Management*.

2.4.3. Conduct electromagnetic compatibility studies and analyses to ensure that equipment in the design or development stages will meet or exceed established specifications and standards and achieve compatibility in its intended operational environment.

2.4.4. Budget for and provide funds to the 85th Engineering Installation Squadron (EIS) for managing and procuring QFIRC support equipment for their unique or specialized test equipment needed to support EMI reduction efforts in regard to spectrum dependent systems with unique electromagnetic operational environment requirements beyond common test equipment capabilities.

2.5. Commander, Space Systems Command (SSC) will:

2.5.1. Review and coordinate electromagnetic compatibility standards with other agencies, in addition to developing military compatibility standards and specifications for the design, development, procurement, production, verification, and measurement of electrical, electronic, and telecommunication equipment.

2.5.2. Design equipment for maximum suppression of undesirable emissions and optimum rejection of potential EMI in accordance with requirements from the NTIA's *Manual of Regulations and Procedures for Federal Radio Frequency Management*.

2.5.3. Provide funds to the 85th EIS for managing and procuring QFIRC support equipment for their unique or specialized test equipment needed to support EMI reduction efforts in regard to spectrum dependent systems with unique electromagnetic operational environment requirements beyond common test equipment capabilities.

2.6. Commander, Space Training and Readiness Command (STARCOM) will conduct electromagnetic compatibility studies and analyses to ensure that equipment in the design or development stages will meet or exceed established specifications and standards and achieve compatibility in its intended operational environment.

2.7. Commander, 85th EIS will:

2.7.1. Act as the technical focal point for the QFIRC and EMI measurements.

2.7.2. Maintain an electromagnetic compatibility office to analyze programs for electronic facilities, identify interference problems and where possible, make or recommend planning adjustments to eliminate or reduce EMI problems.

2.7.3. Establish and maintain the QFIRC program for the DAF. QFIRC services include:

2.7.3.1. Receiving and analyzing reports of interference to operational equipment and systems and provide technical assistance when requested. Technical assistance will include, electromagnetic environmental effects studies, electromagnetic compatibility and interference consultation, on-site interference investigations including direction-finding measurements to locate the source(s) of interference, as well as initiating and recommending corrective actions to resolve interference problems.

2.7.3.2. Procuring and maintaining reasonable quantities of interference reduction devices to resolve operational interference problems.

2.7.3.3. Advising 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 interference problems, where DAF equipment is involved.

2.7.3.4. Upon request, providing technical advice and measurement assistance to AF/A2/6LS and MAJCOM/FLDCOMs 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 HQ.

2.7.3.5. Advising HQ AFMC and HQ SSC of interference trends or developments that require changes in maintenance procedures, requirements for new equipment, or modifications to present equipment.

2.7.3.6. Reviewing and coordinating on compatibility standards, as necessary, with other agencies and assist HQ AFMC and HQ SSC in the development of adequate and useful military standards and specifications for the design, development, procurement, production, test and measurement of electromagnetic spectrum-dependent equipment.

2.7.3.7. Providing DAF 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.

2.7.3.8. Procuring, developing, and employing reliable and accurate measurement techniques and equipment with the sensitivity, accuracy, range, and stability necessary to provide valid electromagnetic measurement data on DAF electronic equipment and systems to evaluate electromagnetic compatibility and interference, and providing measurements and specialized engineering services as outlined in this instruction.

2.7.3.9. Maintaining an online reference library of technical information on actions taken to resolve EMI problems and provide available information to the Joint Spectrum Center (JSC) to be included in the JSIR database.

2.7.3.10. Publishing a user/maintainer technical guide for resolving interference at the local level.

2.8. MAJCOM/FLDCOM, Field Operating Agencies, and Direct Reporting Unit Commanders/Directors will:

2.8.1. Adhere to the guidance herein for the DAF spectrum interference resolution program.

2.8.2. Identify electromagnetic compatibility and interference requirements and request the appropriate technical assistance to perform the required analysis, measurements and evaluations.

2.8.3. Provide a policy letter to establish reporting channels and office of primary responsibility at each level of command or supplement this instruction, as necessary, to include reporting channels and office of primary responsibility at each level of command. Supplements must not impede the reporting of EMI or restrict the direct communication of policy between subordinate units and DAF engineering agencies that provide QFIRC consulting and technical support, measurements and specialized engineering services. A copy of the policy letter or supplement should also be sent to the 85th EIS email addresses listed in [paragraph 4.2.5.1](#) or mail to 670 Maltby Hall Drive, Ste 234, Keesler AFB MS 39534-2633.

2.8.4. Provide a command point of contact for electromagnetic compatibility and interference to the 85th EIS.

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

2.8.6. Assist subordinate organizations with EMI education and training, and the development of local procedures, templates and checklists.

2.8.7. Assist subordinate units in identifying, resolving and reporting EMI.

2.8.8. Determine if the frequency assignments involved in the interference are in compliance with respective spectrum certification and assignment parameters.

2.8.9. Ensure that electromagnetic compatibility requirements are considered before assigning frequencies.

2.8.10. Coordinate actions to resolve interference.

2.9. Installation/Wing (or equivalent) Spectrum Managers will:

2.9.1. Implement a base-level interference resolution program using the guidance contained in this DAFI or provided by the respective MAJCOM/FLDCOM and Numbered Air Force (NAF) as applicable.

2.9.2. Resolve EMI resulting from frequency assignment problems through coordination with DoD AFCs, as required, MAJCOM/FLDCOMs, AF/A2/6LS, and other agencies and foreign countries, through the appropriate Combatant Command, as required.

2.9.3. With assistance from the higher HQ, develop a spectrum interference resolution training program, local interference reporting checklists, and mission specific JSIR templates for all installation spectrum users on all aspects of documenting, analyzing, and reporting.

2.9.4. Assist all victims/users in the completion of the actions noted in [Attachment 2](#) and prescribed offline reporting format and submission channels contained in [Attachment 3](#).

2.9.5. Ensure victim system is operating with a valid frequency assignment and within the specified technical parameters of the assignment.

2.9.6. Coordinate all QFIRC assistance requests through MAJCOM/FLDCOM spectrum management channels.

3. EMI. Can be caused by enemy, neutral, friendly, or natural sources, and is resolved on a case-by-case basis. Users investigate and report as outlined in [paragraph 4](#) using the recommended checklist in [Attachment 2](#).

3.1. EMI from DoD Users. When the interference clearly results from another DoD user, attempt to resolve the interference at the lowest organizational level. **(T-3)** After all local efforts have been exhausted to resolve the interference, request assistance through command spectrum management channels. Within their area of responsibility, installation commanders and DoD AFCs have the authority to implement radio silence/cease jamming operations (Cease Buzzer) procedures for a suspected interfering activity until the interference issue can be resolved.

3.2. EMI from Non-DoD Users. Request assistance through command spectrum management channels, do not go directly to the Federal Communications Commission (FCC) or any other federal agency. **(T-1)** AF/A2/6LS coordinates with the FCC and other government agencies at the national level if the investigation shows that non-federal equipment caused the interference. Within their designated areas, DoD AFCs are authorized to locally coordinate with any federal or non-federal agency to resolve interference at the lowest level possible.

3.3. EMI from Suspected Hostile Sources. The primary difference between hostile and non-hostile EMI is intent. In a training or exercise environment, EMI incidents should initially be treated as non-hostile until proven otherwise. EMI occurring in a hostile operational environment is to be considered hostile until a determination can be made as to the source of the problem. Suspected hostile EMI or electromagnetic attack must be reported and up channeled immediately to the appropriate MAJCOM/FLDCOM office and the Joint Spectrum Center (JSC) in accordance with CJCSI 3320.02F and CJCSI 3320.02E-1. **(T-0)** Military satellite communications incidents will be handled in accordance with the procedures outlined in CJCSM 3320.02E and SPI 3250.01A. **(T-0)**

4. EMI Resolution.

4.1. The victim of the interference will contact the installation spectrum manager (ISM) or other point of contact identified by the higher headquarters (HQ) where the interference has occurred. **(T-2)** The following actions should be initiated/accomplished prior to requesting assistance from the higher HQ Spectrum Management Office (SMO) per [paragraph 4.2](#).

4.1.1. System operator contacts equipment maintenance personnel to determine if the interference is the result of maintenance actions or an equipment malfunction.

4.1.2. System operator contacts other known nearby units to ascertain if they are experiencing the same type of EMI. This may aid in identifying the interference source.

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

4.1.4. After exhausting all local resolution efforts, the ISM, DoD AFC, or MAJCOM/FLDCOM SMO can contact the 85th EIS located at Keesler AFB, MS to request support for the problem. Based on availability, risk to force, and risk to mission, 85th EIS can provide personnel and equipment on-site for further analysis as described in [paragraph 5.1](#).

4.2. EMI Reporting.

4.2.1. Report Precedence. The ISM and MAJCOM/FLDCOM SMO work with the operator to determine precedence consistent with the urgency of the reported situation. If interference is determined to be non-hostile, reporting should be accomplished within two hours of the start of the event.

4.2.2. Suspected Hostile EMI. If EMI is suspected to be intrusion, jamming, or any other potentially hostile activity, it must be reported immediately. **(T-3)**

4.2.3. Security Classification of EMI Reports. Guidelines for classifying interference incidents are contained in CJCSI 3320.02F. Units must evaluate the security sensitivity of the interference on the affected system and classify the report accordingly. **(T-0)** Security classification of interference incidents/reports is determined principally by an operation/platform/equipment security classification guide or stated source of the interference and the sensitivity of the affected military system/operation. Stations located in combat areas or having a sensitive military mission normally classify all interference reports.

4.2.4. Report Format. EMI incidents shall be entered into the Joint Spectrum Interference-Online (JSIR-O) collaboration portal while resolution using local organic assets or host nation assistance is pursued. **(T-0)** Entering the incident in the JSIR-O collaboration portal only provides situational awareness, it does not generate a request for technical support. The JSIR-O collaboration portal is located on the Secure Internet Protocol Router Network (SIPRNet) at <https://intelshare.intelink.sgov.gov/sites/jsir/default.aspx> and Joint Worldwide Intelligence Communication System at <https://intelshare.intelink.ic.gov/sites/jsir/default.aspx>. All spectrum managers involved with EMI resolution will ensure they have proper access and permissions to access the JSIR-O portal to be able to establish alerts and to be able to edit and maintain reports. **(T-0)** As an alternative method of reporting, interference reports can be reported by email. See [Attachment 3](#) for Offline Report Format.

4.2.5. Current reporting addresses for email submissions.

4.2.5.1. DAF units and organizations submitting email notification of JSIR-O reports or offline interference reports through their chain of command to their higher HQ (Wing/Delta, NAF, MAJCOM/FLDCOM SMOs) and DoD AFC as an action addressee, will provide an info copy to AF/A2/6LS and 85th EIS, as the technical focal point for the QFIRC and EMI measurements for the DAF using the appropriate email address for the classification of the report. **(T-3)** NIPRnet email addresses: AF/A2/6LS; afsmocworkflow@us.af.mil, 85th EIS; 85eis.scym.1@us.af.mil, and 85eis.scx.1@us.af.mil SIPRnet email addresses: AF/A2/6LS; usaf.jbanafw.afsmo.mbx-cc-mbx@mail.smil.mil and 85th EIS; USAF.Keesler.81-TW.MBX.85-EIS-SCY@mail.smil.mil.

4.2.5.2. MAJCOM/FLDCOMs can submit offline reports to the 85th EIS at the addresses provided in [paragraph 4.2.5.1](#) as the action addressee with an info copy to appropriate JSC email address; NIPRnet email address disa.sosc@mail.mil or SIPRnet email address disa.sosc@mail.smil.mil. All requests for JSC support will be coordinated through the MAJCOM/FLDCOM SMOs with an information copy to AF/A2/6LS. (T-3)

4.2.5.3. Reports classified above secret are handled on a case-by-case basis, contact AF/A2/6LS for details.

4.3. **Exercise Interference.** During exercise periods, coordinate all interference reports with the Electronic Warfare Cell in the Air Operations Center or Electronic Warfare 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, MAJCOM SMO, or DoD AFC to determine if the interference is an approved part of the exercise.

4.4. **Exceptions to Reporting.** Do not report an incident when:

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

4.4.2. The interference only affects training frequencies assigned on a non-interference basis for training purposes.

4.4.3. Space weather (e.g., high frequency fades, polar cap absorption events, geomagnetic storming, etc.) are reasonably believed to be the cause of interference or confirmed as the cause of the interference. For assistance, notify the local weather unit of the interference to include date, time, location, system, and frequency impacts.

4.4.4. The interference is only experienced aboard intelligence, surveillance and reconnaissance aircraft aloft and is localized when mission equipment or payload equipment is turned on/off or used. In these cases, the interference can 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/EN; the flying unit's Director of Operations can characterize the operational impact. The unit's Director of Maintenance/Maintenance Officer can determine if unit maintenance or calibration resolves the EMI before notifying AFMC. If notified, AFMC determines if any field or depot upgrades meant to resolve the interference are already scheduled.

4.5. **Laser Event Reporting.** The National Air & Space Intelligence Center (NASIC) and the National Space Intelligence Center (NSIC) collectively provide analytical assistance pertaining to hostile laser events against USAF, USSF, and other Military Service's assets as requested, and will be processed in accordance with strategic intelligence priorities. NASIC and NSIC also determine the capability and performance of foreign airborne and spaceborne laser systems, respectively. Data collection on laser events is necessary to understand the nature of the threat and to inform appropriate countermeasure TTPs. Aircrew will report a laser illumination event IAW AFMAN 11-202V3, Flight Operations. (T-3). If analytical

assistance with a laser event related to an airborne asset is required, contact NASIC Electronics Analysis Squadron (NASIC/ACL) at the following numbers: 937-257-4911 or DSN 787-4911, or the NASIC/ACL org box at NASIC.ACL.OrgBox@us.af.mil. For analytical assistance with a laser event related to a space asset, contact NSIC 2nd Space Analysis Squadron at NASIC.NSIC2SAS_ORB_AllPersonnel@us.af.mil.

5. Requesting QFIRC and JSC Assistance.

5.1. The QFIRC reduces or eliminates unintentional (non-hostile) EMI associated with DAF operational equipment. The QFIRC service analyzes and recommends corrective actions for reported interference problems. The 85th EIS provides QFIRC to all DAF units. This unit can provide personnel and equipment to perform on-site direction finding and interference problem analysis. The 85th EIS will document corrective actions and give recommendations for solving interference problems in a formal report that will be forwarded to the requesting unit and to the DoD AFC, its parent MAJCOM/FLDCOM, and AF/A2/6LS. **(T-3)**

5.2. The JSC maintains a central database of interference cases, resolutions, and lessons learned for all DoD and provides analytical and on-site assistance in resolving EMI problems. JSC assistance is requested by AF/A2/6LS after all DAF resources are exhausted.

LEAH LAUDERBACK, Lt Gen, USAF
Deputy Chief of Staff, Intelligence, Surveillance,
Reconnaissance, and Cyber Effects Operations

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

DoDI 3222.03, *DOD Electromagnetic Environmental Effects (E3) Program*, August 25, 2014,
CJCSI 3320.02F, *Joint Spectrum Interference Resolution (JSIR)*, 8 March 2013
CJCSM 3320.02E, *Joint Spectrum Interference Resolution (JSIR) Procedures*, 20 May 2022
CJCSI 3320.02E-1, *Classified Supplement to Joint Spectrum Interference Resolution (JSIR)*, 10
February 2014
JP 3-85, *Joint Electromagnetic Spectrum Operations*, 22 May 2020
DAFPD 17-2, *Cyber Warfare Operations*, 27 October 2020
AFI 33-322, *Records Management and Information Governance Program*, 23 March 2020
AFMAN 11-202V3, *Flight Operations*, 10 January 2022
DAFI 90-160, *Publications and Forms Management*, 14 April 2022
DAFMAN 90-161, *Publishing Processes and Procedures*, 15 April 2022
National Telecommunications and Information Administration, *Manual of Regulations and
Procedures for Federal Radio Frequency Management*, January 2021
SPI 3250.01A, *Satellite Communications (SATCOM)*, 18 May 2020
ACP 190 US SUPP-1(D), *Guide to Frequency Planning*, January 2015

Prescribed Forms

None

Adopted Forms

DAF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

AFC—Area Frequency Coordinator
AFMC—Air Force Materiel Command
CCMD—Combatant Command
CJCSI—Chairman Joint Chiefs of Staff Instruction
CJCSM—Chairman Joint Chiefs of Staff Manual
DAF—the Department of the Air Force
DAFMAN—Department of the Air Force Manual
DoD—Department of Defense
DoDI—Department of Defense Instruction

E3—Electromagnetic Environmental Effects
EIS—Engineering Installation Squadron
EMI—Electromagnetic Interference
FCC—Federal Communications Commission
FLDCOM—Field Command
HQ—Headquarters
ISM—Installation Spectrum Manager
JP—Joint Publication
JSC—Joint Spectrum Center
JSIR—Joint Spectrum Interference Resolution
JSIR-O—Joint Spectrum Interference Resolution-Online
JTF—Joint Task Force
MAJCOM—Major Command
NAF—Numbered Air Force
NASIC—National Air & Space Intelligence Center
NIPRnet—Non-classified Internet Protocol Router Network
NTIA—National Telecommunications and Information Administration
QFIRC—Quick Fix Interference Reduction Capability
SIPRNet—Secure Internet Protocol Router Network
SSC—Space Systems Command
SMO—Spectrum Management Office
SPI—United States Space Command Instruction
STARCOM—Space Training and Readiness Command
USAF—United States Air Force
USSF—United States Space Force
USSPACECOM—United States Space Command

Office symbols

85th EIS—85th Engineering Installation Squadron
AF/A2/6L—Electromagnetic Spectrum Superiority Directorate
AF/A2/6LS—Air Force Spectrum Management Office
AFMC/EN—HQ Air Force Material Command Engineering & Technical Management
JS/J6—Joint Staff, Director for Command, Control, Communications, and Computers/Cyber

NASIC/ACL—National Air & Space Intelligence Center, Analysis Squadron

Terms

Department of Defense Area Frequency Coordinator (DoD AFC)—The DoD AFC is responsible for ensuring successful frequency coordination in the areas that lie within, are adjacent to, or are within radio line-of-sight to any range spectrum-dependent system, including all systems brought to a national test range or other designated complex as defined in ACP 190 US SUPP-1(D) and the NTIA Manual, Chapter 8.

Electromagnetic compatibility—The ability of systems, equipment, and devices that use the electromagnetic spectrum to operate in their intended environments without causing or suffering unacceptable or unintentional degradation because of electromagnetic radiation or response. Also called EMC. (JP 3-85).

Electromagnetic environmental effects (E3)—The impact of the electromagnetic environment upon the operational capability of military forces, equipment, systems, and platforms. Also called E3. (JP 3-85)

Electromagnetic interference—Any electromagnetic disturbance, induced intentionally or unintentionally, that interrupts, obstructs, or otherwise degrades or limits the effective performance of electromagnetic spectrum-dependent systems and electrical equipment. Also called EMI. (JP 3-85)

Attachment 2

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.

<p>To assist users and spectrum managers at the local level, the following checklist can be used to identify and potentially resolve interference. This checklist should be implemented prior to with submitting a JSIR-O interference report or contacting the 85th EIS.</p> <p>EMI incidents that are suspected to be caused by hostile EAs shall be immediately reported on the JSIRO collaboration portal, indicating the hostility of the incident, while attempting resolution. For more information, see CJCSI 3320.02E-1, <i>Classified Supplement to Joint Spectrum Interference Resolution (JSIR)</i>.</p>		
STEP	ACTION	COMPLETE Y/N
1	Start a log and collect as much information about the EMI as possible.	
2	If appropriate measurement equipment is available, attempt to quantify the interference signal characteristics. 1) The interfering source center frequency, 2) Bandwidth, 3) Relative amplitude, 4) Modulation,...	
Geographical Information		
3-1	Contact other units in the geographical area to determine the area affected.	
3-2	Verify exact location of receiver/antenna using GPS, if available.	
4	Determine interference start and stop times.	
5	Have maintenance personnel: <ul style="list-style-type: none"> <input type="checkbox"/> Ensure all connectors are tight. <input type="checkbox"/> Ensure antenna cables are in good condition. <input type="checkbox"/> Ensure equipment is operating IAW technical manual specifications and frequency assignment parameters. 	
6	Verify antenna is on the correct azimuth and elevation if applicable.	
Environment Information		
7-1	Contact nearby units to determine if there is any recently installed equipment.	
7-2	Contact the Electronic Warfare Officer to determine if there is any local jamming or exercise occurring in the local area. If air assets are suspected, validate with spectrum analyzer and have the Electronic Warfare Officer 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 (e.g., High Frequency fades, Polar Cap Absorption events, geomagnetic storming, etc.)	
Frequency Assignment Information		
8-1	Verify through the ISM or MAJCOM/FLDCOM SMO 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 persists after changing to an alternate frequency, immediately submit an interference report through MAJCOM/FLDCOM SMO and the Joint Spectrum Center.	
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>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. Find the approximate bandwidth by varying the receiver frequency to determine the affected frequency band.</p> <p>Determine if the following are true to help characterize the interference:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The interfering signal is encrypted. <input type="checkbox"/> The interfering signal is understandable, e.g., voice. <input type="checkbox"/> Note all settings (demods, bandwidths, gains, etc.) of your receiver equipment that enabled you to hear intelligible information on the interfering signal. <input type="checkbox"/> The interference is due to a steady receive key indicating equipment failures, glitches, or lapses in operational discipline. 	

Attachment 3**OFFLINE REPORT FORMAT****Figure A3.1. Offline Report Format.**

Since all reported interference reports should be submitted to the DoD central repository managed by the JSC at <https://intelshare.intelink.sgov.gov/sites/jsir/default.aspx>, the following reporting format can be used to facilitate the process and should be reported by any electronic means possible, email being the preferred method. Alternately, a spreadsheet is available on the same DoD central repository that can be downloaded for offline use and uploaded to the repository using the instructions provided on the website.

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 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 (NIPRnet)/(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 interference 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 interference 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:** Document approximate interference rate; include start and stop times or “ongoing.” Indicate whether the duration of the interference is continuous or intermittent, if occurring at a regular or irregular time of day and if 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. **Electromagnetic interference 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 and include declassification instructions as appropriate.