



ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

Item 3: Strengthening collaboration to address frequency challenges

Session 4 : National Interference management practices

**AERONAUTICAL RADIO FREQUENCY INTERFERENCE
MANAGEMENT- NIGERIA**



**Virtual Workshop on Aeronautical Frequency Management for the WACAF
Region, from 4 to 5 December 2025**

*Atelier virtuel sur la gestion des fréquences aéronautiques – Région WACAF
4 au 5 décembre 2025*

SESSION 4 : NATIONAL FREQUENCY MANAGEMENT AND INTERFERENCE MANAGEMENT PRACTICES



NIGERIA CIVIL AVIATION AUTHORITY

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OUTLINE

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ASSIGNMENT PROCESS -
NIGERIA

02 UNDERSTANDING THE IMPACT
OF INTERFERENCE ON
COMMUNICATION SYSTEMS

03 SOME EXAMPLES OF
AERONAUTICAL INTERFERENCE
WITHIN COMMUNICATION,
NAVIGATION, SURVEILLANCE
(CNS) SYSTEMS

01

Aeronautical Frequency Assignment Process - Nigeria



1. AERONAUTICAL FREQUENCY ASSIGNMENT PROCESS - NIGERIA

1.1 Overview of the Process and Its Importance



Regulatory Governance

Frequency assignment is managed by national and international aviation authorities to ensure global communication standards.



Safety and Interference Prevention

The process prevents signal interference and guarantees operational safety for all civil aviation communications.



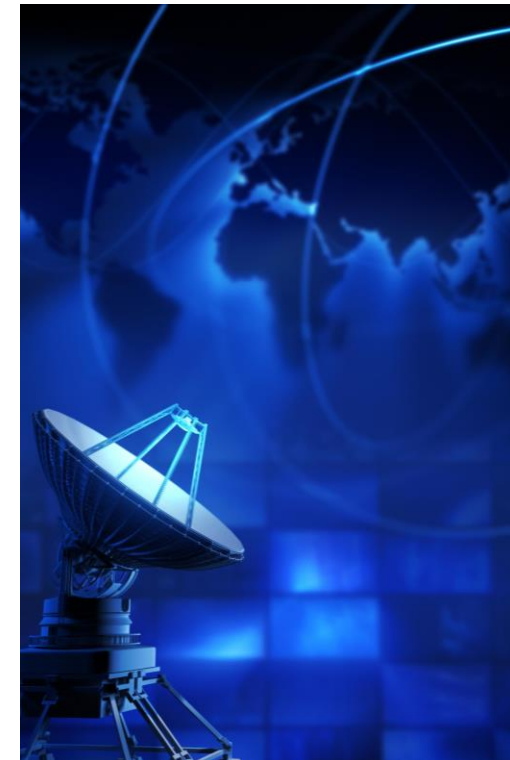
Global Coordination

International coordination ensures seamless communication across borders and supports worldwide flight operations.



Efficient Spectrum Usage

Frequency resources are allocated fairly and efficiently, optimizing spectrum use for aviation services.



1. AERONAUTICAL FREQUENCY ASSIGNMENT PROCESS - NIGERIA

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1.2 Phases of the Frequency Assignment Process

**Phase 1:
Application
Submission**

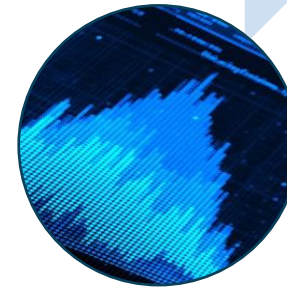
**Phase 2:
Authority
Response**

**Phase 3:
Applicant
Submissions**

**Phase 4: Site
Validation
Inspection**

**Phase 5:
Frequency
Plotting and
Coordination**

**Phase 6:
Assignment
Issuance**



1. AERONAUTICAL FREQUENCY ASSIGNMENT PROCESS - NIGERIA

1.2 Phases of the Frequency Assignment Process

Phase 1: Application Submission

Initiation of Request

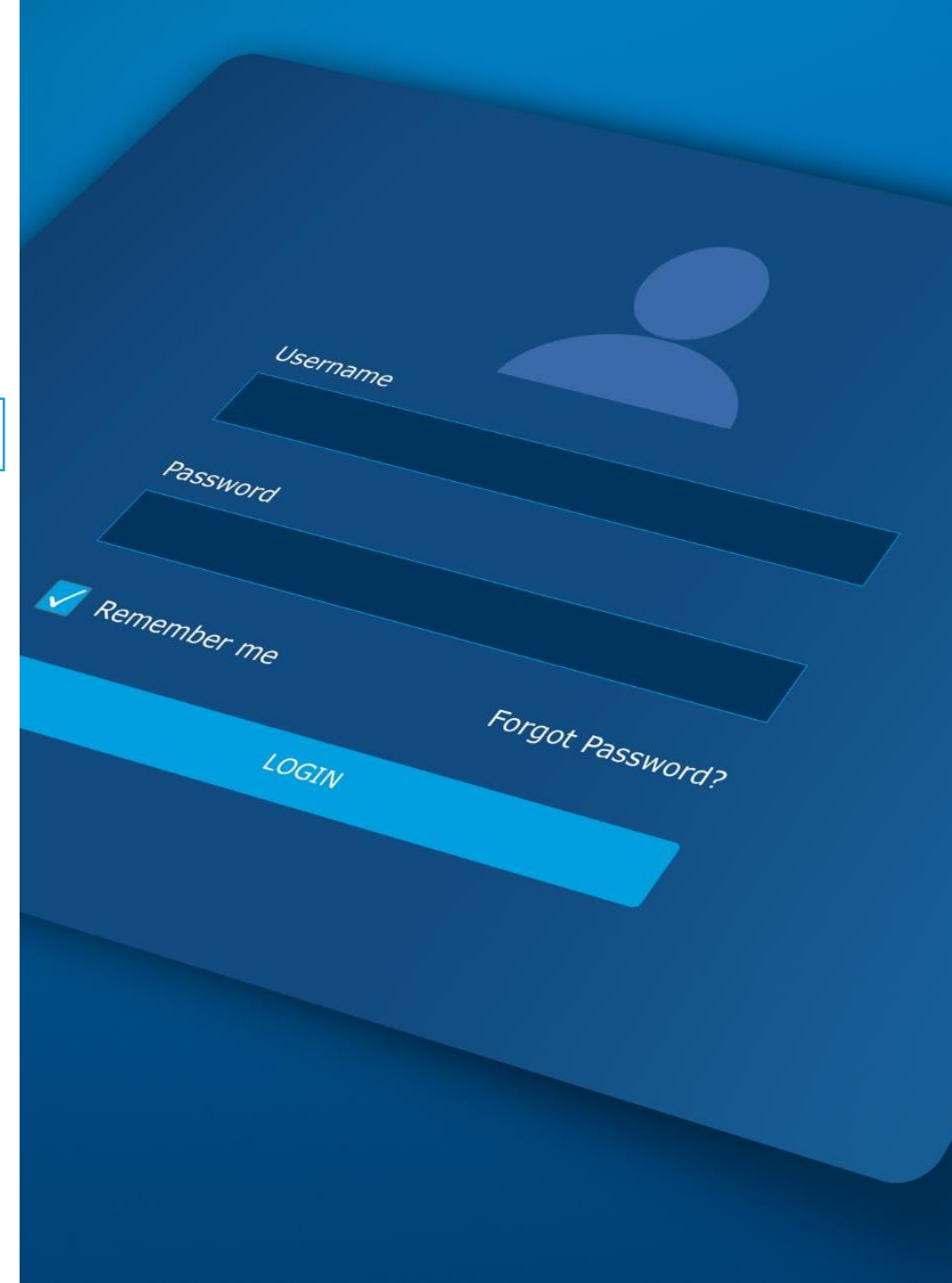
Service providers identify the need and formally submit requests for specific aeronautical radio service to DGCA.

Detailed Application Content

Applications must include detailed usage and deployment location information for proper evaluation.

Importance of Documentation

Complete and accurate documentation is crucial to avoid delays in the application process.



1. AERONAUTICAL FREQUENCY ASSIGNMENT PROCESS - NIGERIA

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1.2 Phases of the Frequency Assignment Process

Phase 2: Authority Response



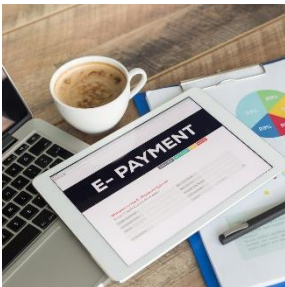
Issuing Tailored Application Forms

The authority provides specific application forms tailored to aeronautical frequency service requests.



Technical Documentation Requirements

Applicants must submit detailed technical documentation, including site location, site coordinates and equipment manuals.



Inspection Fees and Guidelines

Instructions for payment of inspection fees and submission guidelines help ensure compliance.

1. AERONAUTICAL FREQUENCY ASSIGNMENT PROCESS - NIGERIA

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1.2 Phases of the Frequency Assignment Process

Phase 3: Applicant Submissions



Application Completion

Applicant are required to fill out the formal application form accurately to start the approval process.



Fee Payment

Required inspection fees must be paid promptly to proceed to the evaluation stage.



Technical Documentation Submission

All necessary technical documents, including equipment manuals and specifications, are submitted for review.



Site Coordinates Provided

Accurate geographical coordinates of the proposed site are supplied within the deadline for inspection planning.





1. AERONAUTICAL FREQUENCY ASSIGNMENT PROCESS - NIGERIA

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1.2 Phases of the Frequency Assignment Process

Phase 4: Site Validation Inspection

Site Suitability Verification

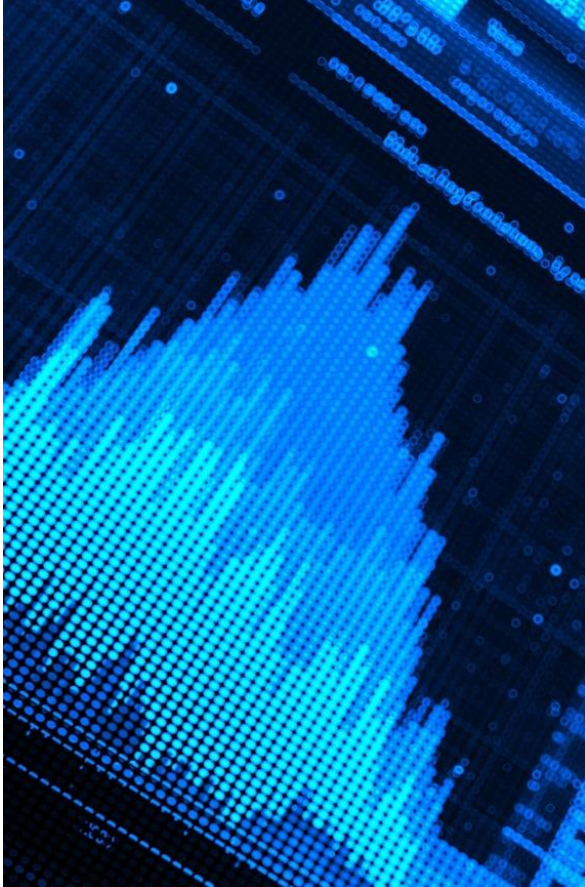
Inspection confirms if the site is appropriate for frequency deployment based on location, terrain and available infrastructure.

Regulatory Compliance Assessment

NCAA Inspector verify that the site adheres to all regulatory standards and technical requirements.

Validation of Site Details

Accurate site data is confirmed to ensure reliable frequency plotting and coordination.



1. AERONAUTICAL FREQUENCY ASSIGNMENT PROCESS - NIGERIA

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1.2 Phases of the Frequency Assignment Process

Phase 5: Frequency Plotting and Coordination

Spectrum Availability Analysis

NCAA Inspector assesses spectrum availability to ensure optimal frequency selection using the ICAO frequency allotment for regions(AFI region) .

Frequency Plotting

Proposed frequencies based on regional allotment chart are plotted on national and regional aeronautical charts using the ICAO Frequency Finder software to ensure clear visualization and effective planning.

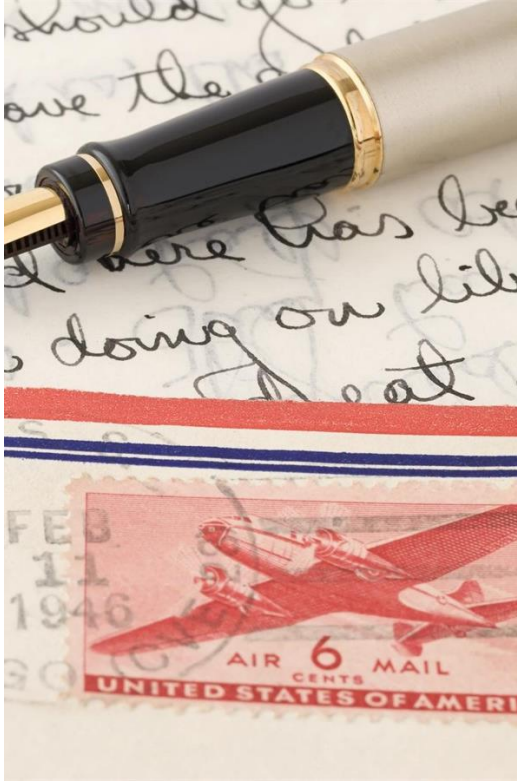
This process also includes compatibility checks with adjacent FIRs and an assessment of potential interference.

International Coordination

Coordination with ICAO ensures compliance with global standards for aviation frequency management.

Updating Frequency Assignments

ICAO's frequency assignment list is updated to maintain harmonization and prevent conflicts internationally.



1. AERONAUTICAL FREQUENCY ASSIGNMENT PROCESS - NIGERIA

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1.2 Phases of the Frequency Assignment Process

Phase 6: Assignment Issuance

ICAO Frequency Approval/validation

The proposed frequency for assignment is forwarded via email to ICAO regional office for validation.

ICAO confirms the proposed frequency's suitability and updates the international registry for assignment.

ICAO forwards a validation letter to the NCAA

Assignment Letter

The NCAA on receiving the validation letter, issues a formal letter authorizing frequency use at the validated site to finalize the process.

Ensuring Compliance

Assignment ensures frequency use complies with regulations and technical standards for aviation safety.

02

UNDERSTANDING
THE IMPACT
OF
INTERFERENCE
ON
COMMUNICATION
SYSTEMS



2. UNDERSTANDING THE IMPACT OF INTERFERENCE ON COMMUNICATION SYSTEMS

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“Frequency interference can totally disrupt communication systems, causing information loss, errors, and even equipment damage. It's like trying to have a conversation in a noisy room - you can't hear the other person clearly.”

Key Impacts:

- ✓ Signal Distortion: Interference can alter the original signal, making it hard to decode.
- ✓ Data Errors: Interference can cause data corruption, leading to errors or loss.
- ✓ System Crashes: Severe interference can shut down entire systems.
- ✓ Safety Risks: Interference can compromise critical systems, posing safety risks.

Affected Systems:

- ✓ Wireless Networks: Wi-Fi, cellular, and satellite communications
- ✓ Radio Systems: Broadcasting, aviation, and emergency services
- ✓ Navigation Systems: GPS and navigation

Mitigation Strategies:

- ✓ Filtering: Use filters to remove unwanted signals
- ✓ Shielding: Protect equipment from electromagnetic radiation
- ✓ Frequency Planning: Coordinate frequencies to minimize interference.
- ✓ Error Correction: Implement error correction techniques

03

EXAMPLES OF AERONAUTICAL INTERFERENCE WITHIN COMMUNICATI ON, NAVIGATION, SURVEILLANCE (CNS) SYSTEMS



3.1 EXAMPLES OF AERONAUTICAL INTERFERENCE WITHIN COMMUNICATION, NAVIGATION, SURVEILLANCE (CNS) SYSTEMS

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3.1 FREQUENCY INTERFERENCE ON LAGOS PRIMARY TOWER FREQUENCY (118.1MHz)



CAUSE OF INTERFERENCE



Interference was discovered on primary tower frequency based on reports from pilots once they are about 6 miles or 11Km to touch down only on inbound flights.

INVESTIGATION

- ❑ An investigation carried out showed that the interference was caused as a result of **inter-modulation** of two radio station frequencies; Melody FM (107.7MHz) and Classic FM (97.3MHz). The resultant harmonics on the upper side band and lower side band falls on 118.1MHz. (See calculation);
- ❑ Inter-modulation is calculated as $2 * F_1 (107.7) - F_2 (97.3)$

$= 215.4 - 97.3$
 $= 118.1$
- ❑ Further investigation revealed that Melody FM installed its mast 75m high along the approach path which is about 4km to touch down zone but an approval of 15m was given by the Authority.

3.1 EXAMPLES OF AERONAUTICAL INTERFERENCE WITHIN COMMUNICATION, NAVIGATION, SURVEILLANCE (CNS) SYSTEMS

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3.1 FREQUENCY INTERFERENCE ON LAGOS PRIMARY TOWER FREQUENCY (118.1MHz)

ACTION TAKEN

- ✓ Nigeria Airspace Management Agency (NAMA) carried out maintenance and checks on all communication equipments to ensure their radios radiates within appropriate tolerance.
- ✓ Am immediate removal of mast belonging to Melody FM or reduction in height to 15m as approved by the Authority.

SOLUTION

After the reduction of height of mast to 50m there has been no report of interference recorded from the inbound flights.



3.1 EXAMPLES OF AERONAUTICAL INTERFERENCE WITHIN COMMUNICATION, NAVIGATION, SURVEILLANCE (CNS) SYSTEMS

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3.2 FREQUENCY INTERFERENCE BETWEEN EKITI PRIMARY TOWER FREQUENCY AND OWERRI PRIMARY TOWER FREQUENCY

CAUSE OF INTERFERENCE

Interference was discovered on primary tower frequency based on reports from pilots once they are about 6 miles or 11Km to touch down only on inbound flights.



ACTION TAKEN

Ekiti tower frequency was immediately changed to the secondary frequency 119.25MHz.

CONCLUSION

The changed of Ekiti tower frequency from 118.4MHz to 119.25MHz put a stop to the interference and no report of such has been recorded.



3.1 EXAMPLES OF AERONAUTICAL INTERFERENCE WITHIN COMMUNICATION, NAVIGATION, SURVEILLANCE (CNS) SYSTEMS

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3.3 FREQUENCY INTERFERENCE BETWEEN TREBET AVIATION AND UNITED NIGERIA AIRLINES



CAUSE OF INTERFERENCE

- ✓ A report of interference between United Nigeria Airlines and TREBET Aviation on 131.250MHz was received. Another case of co-channel interference. The two airlines operates on the same frequency 131.250MHz.
- ✓ United Nigeria Airlines had gotten the approval of frequency assignment 131.250MHz through the Authority while TREBET Aviation could not provide approval evidence by the Authority.

ACTION TAKEN

TREBET Aviation formerly requested for new aeronautical ground station frequency assignment and 131.175MHz was assigned.

CONCLUSION

TREBET Aviation formerly requested for new aeronautical ground station frequency assignment and 131.175MHz was assigned.



3.1 EXAMPLES OF AERONAUTICAL INTERFERENCE WITHIN COMMUNICATION, NAVIGATION, SURVEILLANCE (CNS) SYSTEMS

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3.4 FREQUENCY INTERFERENCE ON LAGOS PRIMARY TOWER FREQUENCY (118.1MHz).



CAUSE OF INTERFERENCE

Another case of inter-modulation of two radio station frequencies; Jordan FM and Lasgidi FM. The resultant harmonics on the upper side band and lower side band falls on 118.1MHz.

Jordan FM was given **an approval of 70m** for its mast by the Authority but installed a height of 80m.

ACTION TAKEN

- Nigeria Airspace Management Agency (NAMA) carried out maintenance and checks on all communication equipments to ensure their radios radiates within appropriate tolerance.
- Am immediate removal of mast belonging to Jordan FM or reduction of height to 70m as approved by the Authority.

CONCLUSION

After the reduction of height of mast to 70m there has been no report of interference recorded from the inbound flights.

Thank You

