

THE NATIONAL ACADEMIES

Computer Science and Telecommunications Board

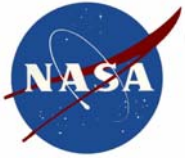
A NASA Perspective On Improving Spectrum Management March 1, 2006



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Washington, D.C.**





SPECTRUM DEFINED

Spectrum – What is it and why does NASA Care?

- The “Invisible Infrastructure”
- A “Public Good” that needs to be Protected
- A Critical Enabler of all things Radio
- A finite resource generating urgent demand

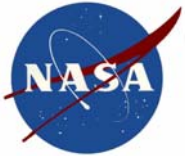


\$ Prime “Beach Front” Property!

**RADIO FREQUENCY SPECTRUM
IS THE ELECTRONIC
FOUNDATION OF OUR NATION**

\$ 21ST Century Gold!



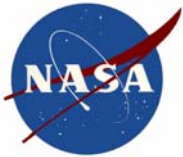


“SPECTRUM ENCROACHMENT” OR “SHARING”?

- Harmful interference to safety-of-life signals forces constraints on critical operations
 - **Limits infrastructure and equipage options**

- Spectrum encroachment will force costly upgrades to current user and service provider equipment
 - **Complicates future certification processes**

- Rise of electromagnetic “Noise Floor” in sensitive bands could prevent critical safety services from maturing
 - **GPS positioning, navigation, & timing (PNT), earth observation, radio astronomy, space research, etc.,**

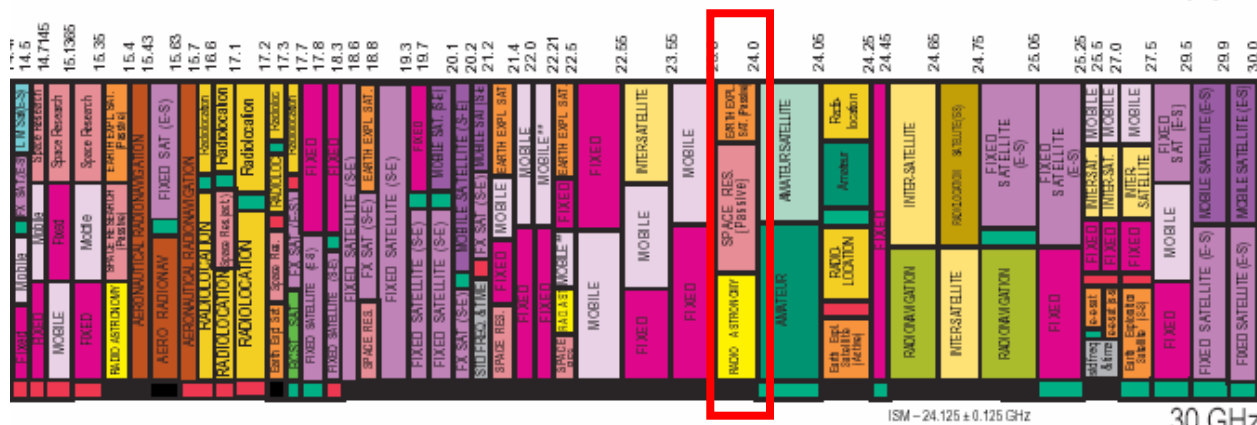
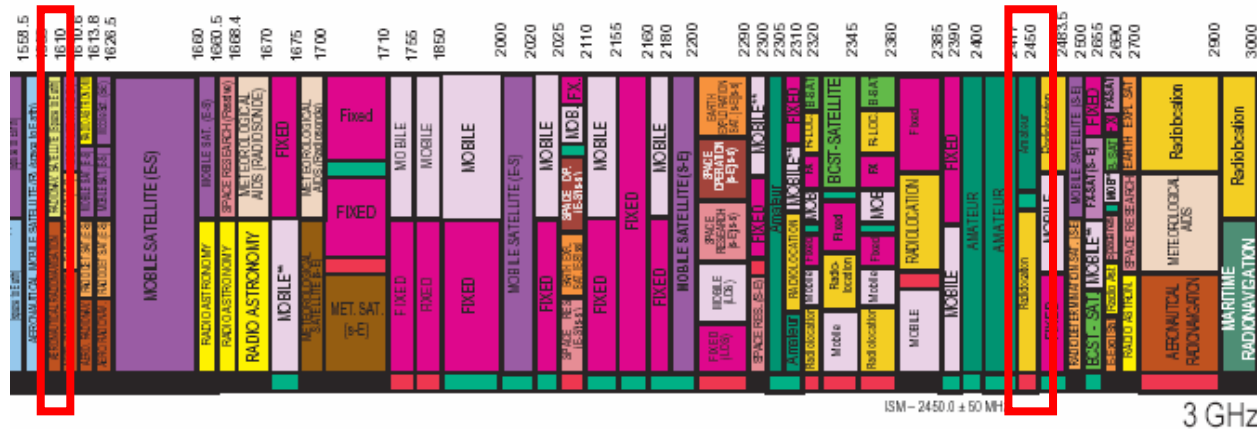


Long Term Impacts to Spectrum Noise Floor

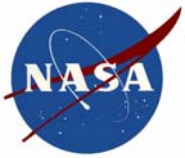
- NASA is particularly concerned with the **electromagnetic noise floor** in radio bands used for **crucial safety** and **scientific purposes**, such as the **L1-Band (1563.42 - 1587.42 MHz)** used for the **Global Positioning System (GPS)** and the **Passive Sensing Band (23.6 – 24.0 GHz)** used for earth observation, radio astronomy, and space research.

L1 - Band

2.4 ISM -Band

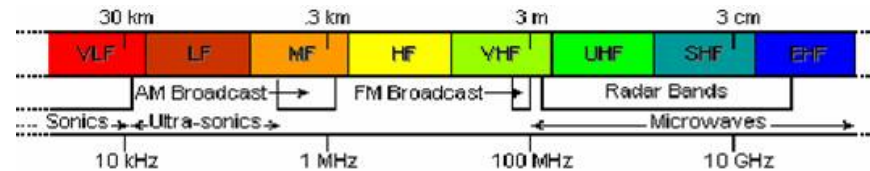


Passive Sensor Band



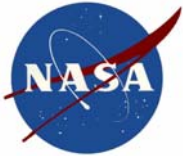
SPECTRUM REFORM NEEDED

PROBLEMS:



- **United States General Accounting Office (GAO)**
(now known as the Government Accountability Office)
 - **TELECOMMUNICATIONS (January 2003) *Comprehensive Review of U.S. Spectrum Management with Broad Stakeholder Involvement Is Needed***
 - **TELECOMMUNICATIONS (September 2002) *Better Coordination and Enhanced Accountability Needed to Improve Spectrum Management***

“Existing legal and policy framework for spectrum management has not kept pace with the dramatic changes in technology and spectrum use.”



DELIVERABLES

SPECTRUM POLICY FOR THE 21ST CENTURY – THE PRESIDENT’S SPECTRUM POLICY INITIATIVE: REPORT 1

RECOMMENDATIONS OF THE FEDERAL GOVERNMENT
SPECTRUM TASK FORCE



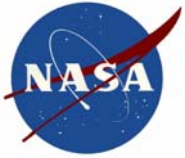
U.S. DEPARTMENT OF COMMERCE
DONALD L. EVANS, SECRETARY
MICHAEL D. GALLAGHER, ACTING ASSISTANT SECRETARY
FOR COMMUNICATIONS AND INFORMATION
JUNE 2004

SPECTRUM POLICY FOR THE 21ST CENTURY – THE PRESIDENT’S SPECTRUM POLICY INITIATIVE: REPORT 2

RECOMMENDATIONS FROM STATE AND LOCAL GOVERNMENTS
AND PRIVATE SECTOR RESPONDERS



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Meet Critical Spectrum Needs:

No. 13 Policy and Plans Steering Group (PPSG)

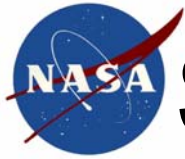
Establish a Policy and Plans Steering Group (PPSG) to formalize the coordination process and to ensure national security, homeland security, public safety, federal transportation infrastructure, scientific research, and economic opportunity are taken fully into consideration

No. 14 Policy Coordinating Committee (PCC)

As needed, the existing White House Policy Coordinating Committee (PCC) should be used to address spectrum-based radiocommunication issues that have not been resolved by the PPSG

No. 15 Formalize Arrangement With the FCC Defense Commissioner

Work closely with the FCC's Defense Commissioner to ensure the concerns of the agencies affected by national security, homeland security, public safety, and federal transportation infrastructure issues are



Spectrum Reform is Progressing

- RECOMMENDATIONS COMPLETE -

Spectrum Report 1: Recommendations of the Federal Government Task Force

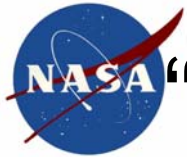
Spectrum Report 2: Recommendations from State and Local Governments and the Private Sector

- IMPLEMENTATION ONGOING -

- ▶ 1. Develop Federal Departments' Spectrum Strategic Plans
✓ To NTIA by November 30, 2005

- ▶ 2. NTIA will compile a comprehensive Federal Government Strategic Spectrum Plan.

PNT Executive Committee Departments will ensure this includes regulatory protections for GPS/GNSS

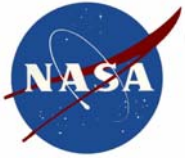


“Economic Incentives” or “Mandates”?

- “Unlicensed spectrum underlays” on existing services
 - “Burden shift” from new entrants to incumbents
 - “Spectrum Commons”
 - “Commodity Trading”
 - “Secondary Markets”
 - “Auctions”
-
- **“Market Model”** of spectrum management must be used with caution.
 - **Lower entry barriers** and **private sector competition** does not support public safety missions.

ONE TRANSLATION OF “SHARING”:

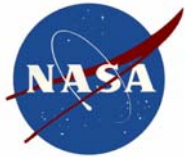
“Not enough spectrum to go around, so we want yours...”



SUMMARY

- **NASA firmly supports spectrum innovation and creativity, however... maintaining a safe and effective infrastructure for aeronautics and space is our first priority**
- **Consensus Recommendations of the President's Spectrum Policy Initiative will improve Executive Branch spectrum management, coordination, transparency, and accountability**
- **U.S. and International spectrum positions and regulatory actions must reflect a sensible balance between national security, public safety, and economic growth**





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