DEPARTMENT OF DEFENSE (DOD) SPECTRUM MANAGEMENT

Information Brief
NTIA Radio Frequency Spectrum Management Seminar

Presented by: Mr. Tom Kidd
Director, Strategic Spectrum Plans & Policies
Office of the Chief Information Officer
Department of the Navy
703-601-3594

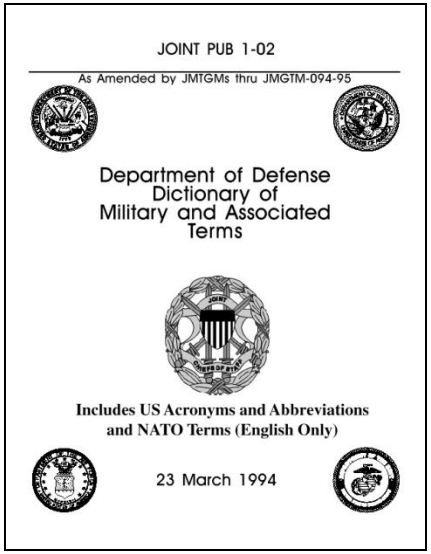
Outline

- Spectrum Management Defined
- Why Spectrum Management
- Certification Process
- Host Nation Coordination
- Assignment Process
- Emerging Spectrum Technologies
- Questions

Spectrum Management

JOINT PUBLICATION 1-02

DoD DICTIONARY OF MILITARY AND ASSOCIATED TERMS

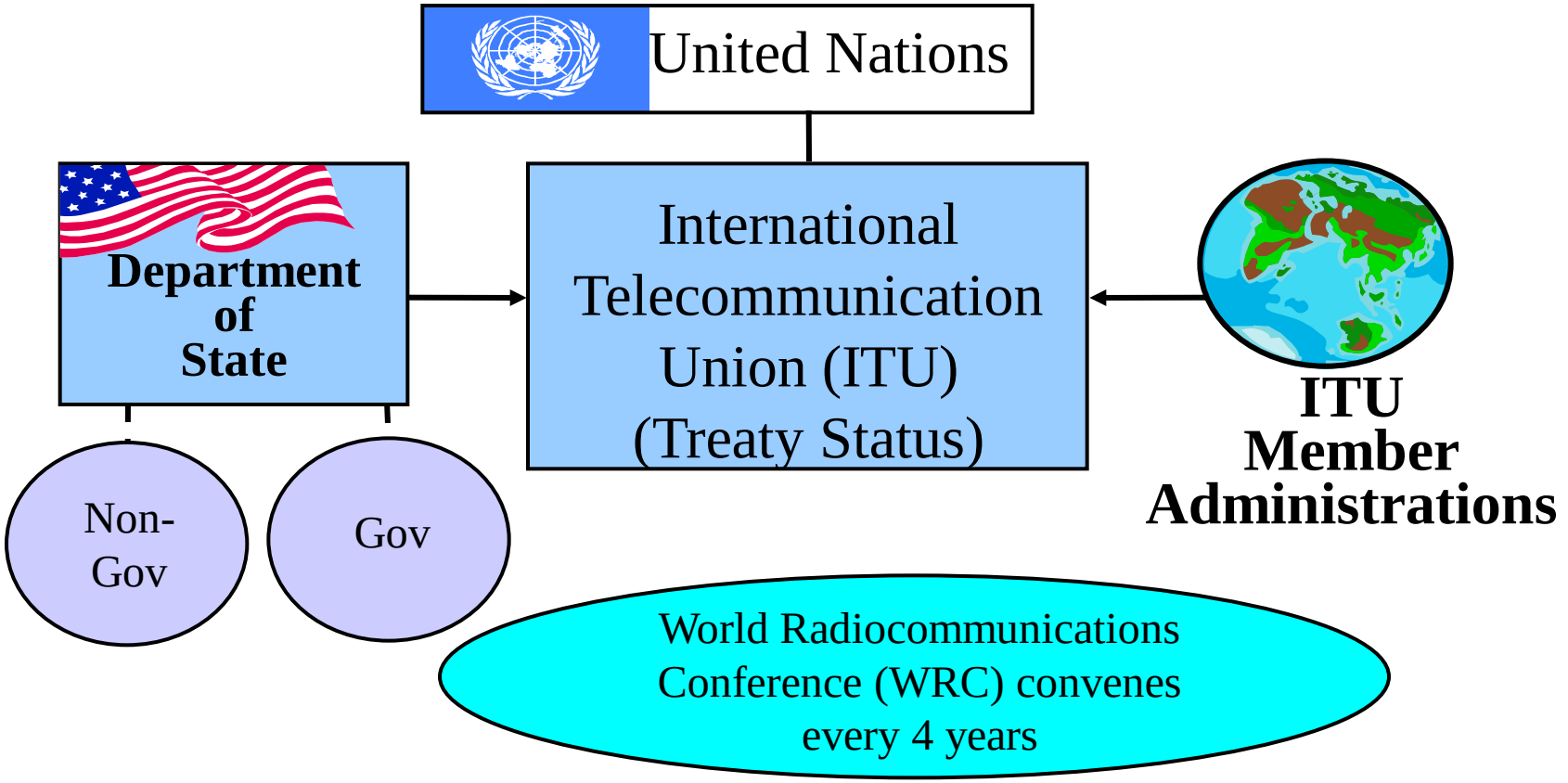


"PLANNING, COORDINATING, AND MANAGING JOINT USE OF THE ELECTROMAGNETIC SPECTRUM THROUGH OPERATIONAL, ENGINEERING, AND ADMINISTRATIVE PROCEDURES, WITH THE OBJECTIVE OF ENABLING ELECTRONIC SYSTEMS TO PERFORM THEIR FUNCTIONS IN THE INTENDED ENVIRONMENT WITHOUT CAUSING OR SUFFERING UNACCEPTABLE INTERFERENCE."

Why Spectrum Management

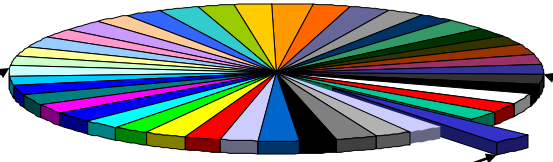
- "WHY" does DOD do Spectrum Management?
  - Ensure that our equipment is compatible
  - Support our troops' operations worldwide

International Spectrum Management



US Preparation Process

International Telecommunication Union (ITU)
193 Member States



Sector Members
ICAO, Red Cross, IMO, Industry, etc

International Study Groups

1 vote per nation

US State Department*

National Committee

NTIA

FCC

IRAC

WAC
(World Radiocommunications Advisory Counsel)

RCS
(Radio Conference Subcommittee)

IWG
(Informal Working Groups)

Federal Agencies
Military Departments
(DA / DON / DAF)

Industry Representatives

US Statutory Requirements

- **Title 47USC § 305**
  - Communications Act of 1934, as amended
    - Government owned stations - Authority of President
- **Public Law 102-538**
  - "Telecommunications Act of 1992"
- **Title 47USC § 901, § 902, § 903, § 904**
  - National Telecommunications and Information Administration (NTIA)
  - Includes EO12046 to delegate Presidential Authority to DOC/NTIA

Presidential Directives and Regulatory Requirements

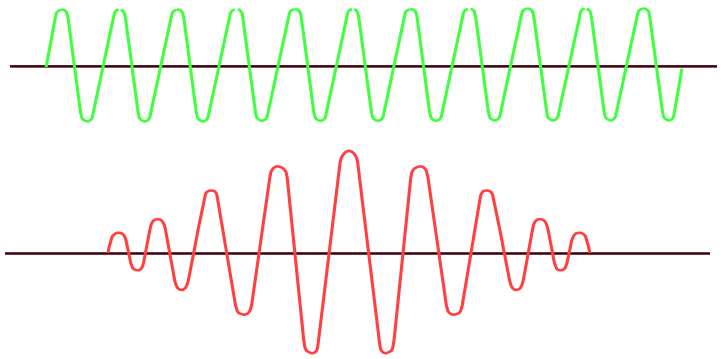
- **OMB Circular A-11**
- **Code of Federal Regulations**
  - 47CFR300.1
- **DOD Acquisition Regulations (5000 series)**
- **DOD Instruction 4650.01**
  - "Policy and Procedures for Management and Use of the Electromagnetic Spectrum"
- **MILDEP Unique Regulations and Directives**

Spectrum Management

Supportability (Certification)

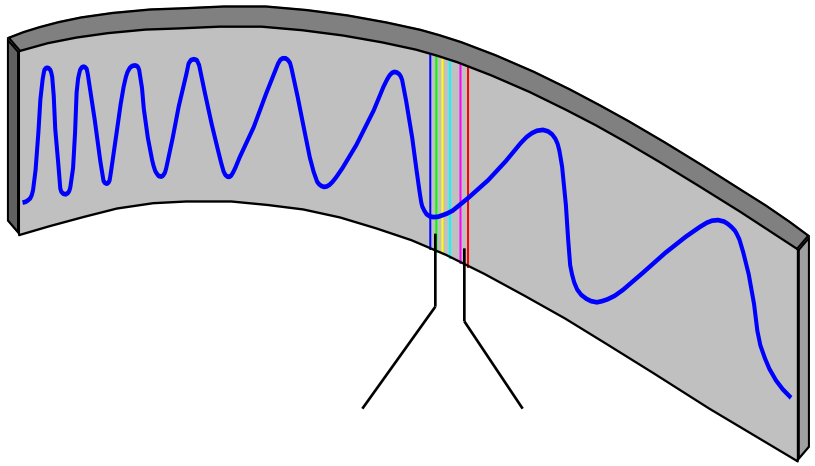
-What other systems are in band?

- Is there enough spectrum available to support requirement?



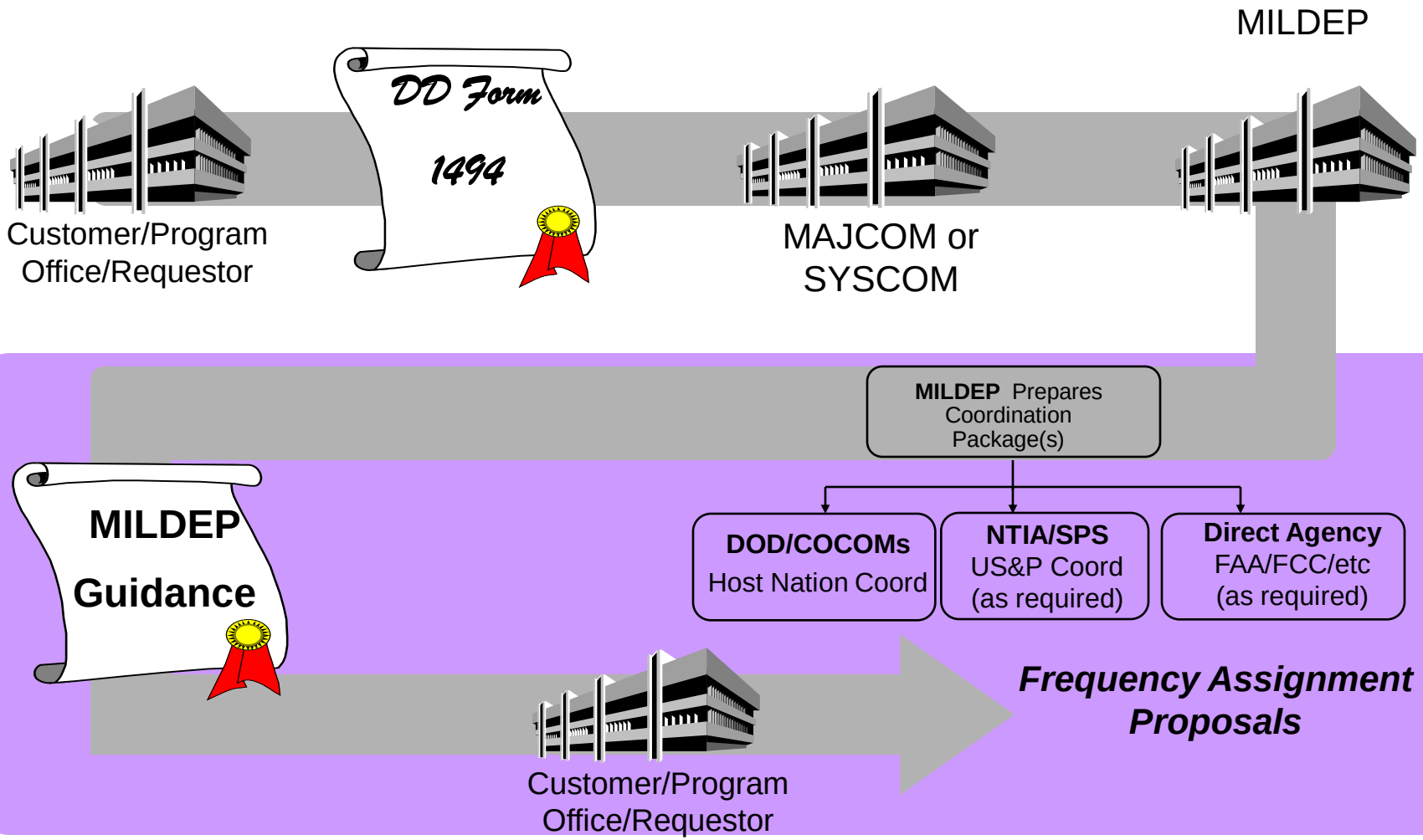
Assignment

Approval to use a specific channel in a specified manner



DOD Spectrum Supportability Process

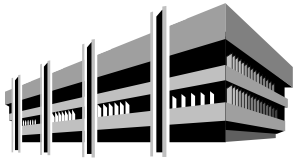
(Example only)



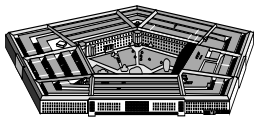
DD 1494 Equipment Application

- Used by Procuring Organization to Submit Request and Obtain Equipment Spectrum Certification
  - Detail Equipment RF Characteristics
  - Four Stages:
    - Stage 1 – Conceptual
    - Stage 2 – Experimental
    - Stage 3 – Developmental
    - Stage 4 – Operational
  - **Includes DoD Page, Transmitter Page(s), Receiver Page(s), Antenna Page(s), NTIA Page, and Foreign Coordination Page**

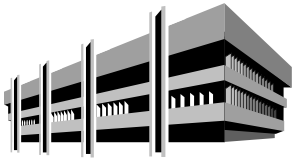
Equipment Design Coordination, Analysis & Negotiation



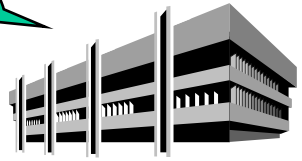
COCOMs-Host Nations Analyze EMC, regulatory compliance & impact to host/ allied systems



MILDEP CIOs Implement Coordination & Additional EMC studies, & Analyze impact to other DOD systems



FAA/FCC/etc. Analyze EMC & impact to systems

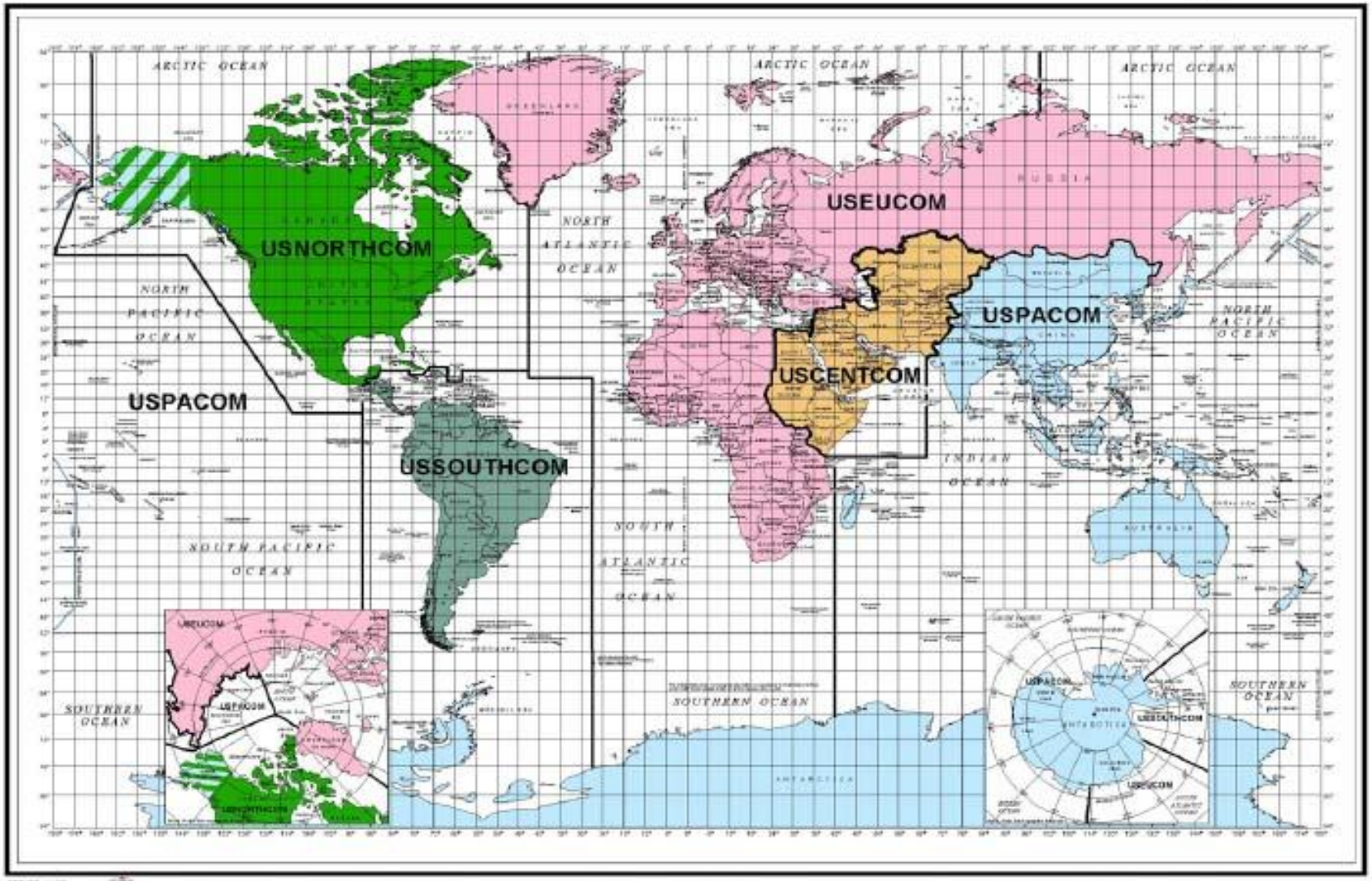


NTIA/SPS Analyze EMC, US regulatory compliance & impact to Federal systems

Results of analysis & coordination provided to Procuring Organization via MILDEP CIO

Host Nation Coordination

Commanders' Area of Responsibility



Observations

- **Early consideration of spectrum supportability reduces program impacts (cost and schedule)**
- **The *Wireless Revolution* will continue**
  - Spectrum = “Big $”, in US and abroad
- **Technology “lead dates” are getting shorter**
  - Acquisition reform will continue

The challenge will become increasingly more difficult

DoD
FRRS/GMF

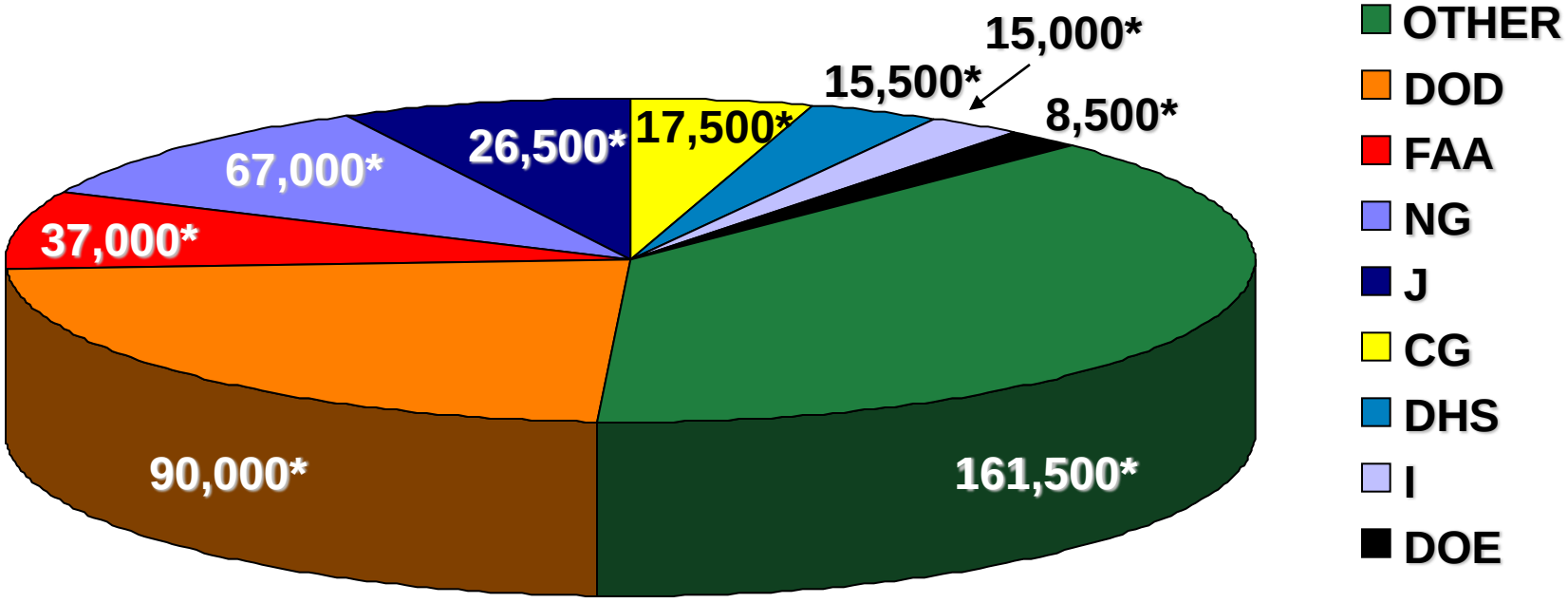
FREQUENCY ASSIGNMENTS

Frequency Resource Records System (FRRS)

FRRS Member	Records in FRRS Database
Department of the ARMY	35,500*
Department of the AIR FORCE	30,500*
Department of the NAVY	28,000*
USPACOM	16,000*
USEUCOM	4,000*
USJFCOM	3,000*
USSOUTHCOM	2,500*
USCENTCOM	1,500*
OTHER	100*
TOTAL	**121,100***

*Approximate

Government Master File (GMF)
Major Users



DOD has approx 20% of the GMF records

*Approximate

DoD Has *Approx* 124,500* Assignments In The FRRS And 90,000* In The GMF

Department of the Army Assignments:
- 35,500* FRRS
- 35,000* GMF

Department of the Air Force Assignments:
- 31,000* FRRS
- 28,000* GMF

Department of the Navy Assignments:
- 28,000* FRRS
- 27,000* GMF

*Approximate

Challenges and Opportunities

- **Domestic**
  - National Broadband Plan
    - “find 500 MHz”
  - Reallocations
    - Effect on the acquisition cycle
- **International**
  - Software Defined Radio (SDR)
    - Radio Emulators
  - Dynamic Spectrum Access (DSA)
    - Multiple methods beyond sensing

Software Defined Radio (SDR)

- "a radio communication system where components that have typically been implemented in hardware (e.g. mixers, filters, amplifiers, modulators/demodulators, detectors. etc.) are instead implemented using software on a personal computer or other embedded computing devices"
  http://en.wikipedia.org/wiki/Software-defined_radio of 6 May 09
- Offers a myriad of benefits for Navy and Marine Corps Communications
  - Multiple waveforms in a single box
- Initial SDR systems & equipment will be largely waveform emulators

Dynamic Spectrum Access (DSA)

- “"Dynamic Spectrum Access is the real-time adjustment of Spectrum Utilization in response to changing circumstances and objectives.", ”
  http://en.wikipedia.org/wiki/IEEE_SCC41of 1 March 2010

- Offers a myriad of benefits for all users of the electromagnetic spectrum

Points of Contact

Department of the Army
Army Spectrum Management Office
armyspecmgmt@hqda.army.mil
– (703) 325-8226

Department of the Navy
Navy-Marine Corps Spectrum Center
– navyspectrum@nmsc.navy.mil
– (703) 325-2714

Department of the Air Force
Air Force Frequency Management Agency
– affma.cc@pentagon.af.mil
– (703) 428-1544

Department of Defense
Defense Spectrum Organization
– dso@disa.mil
– (703) 325-0435

Questions?

Thank You