

AFFTC-PA-12286



## C-Band Working Group Update

Steve O'Neal

AIR FORCE FLIGHT TEST CENTER  
EDWARDS AFB, CA

2/20/13

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# REPORT DOCUMENTATION PAGE

*Form Approved*  
*OMB No. 0704-0188*

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<b>1. REPORT DATE</b> (20-02-2013)		<b>2. REPORT TYPE</b> Technical		<b>3. DATES COVERED</b> (From - To) 3/12 -- 5/12	
<b>4. TITLE AND SUBTITLE</b> C-Band Working Group Update				<b>5a. CONTRACT NUMBER</b> MIPR	
				<b>5b. GRANT NUMBER</b>	
				<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b> Steve O'Neal				<b>5d. PROJECT NUMBER</b>	
				<b>5e. TASK NUMBER</b>	
				<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Jacobs Corporation, Steve.Oneal.ctr@edwards.af.mil				<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b> AFFTC-PA-12286	
<b>9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> Tom Young, EA				<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b> N/A	
				<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>	
<b>12. DISTRIBUTION / AVAILABILITY STATEMENT</b> Approved for public release A: distribution is unlimited.					
<b>13. SUPPLEMENTARY NOTES</b> CA: Air Force Flight Test Center Edwards AFB CA                      CC: 012100					
<b>14. ABSTRACT</b> As a way to alleviate today's Spectrum congestion by augmenting operations using C-Band T&E mission execution delays caused by L/S spectrum assignments constraints Improve mission capabilities with services not possible using current L/S allocations "Use it or lose it"... Spectrum not being used is always a prime target for others who want additional spectrum Preparing for future spectrum auctions by experimenting with C-Band					
<b>15. SUBJECT TERMS</b> C-Band Working Group Update, Spectrum, Telemetry, L-band, S-band, C-band					
<b>16. SECURITY CLASSIFICATION OF:</b> Unclassified			<b>17. LIMITATION OF ABSTRACT</b>  None	<b>18. NUMBER OF PAGES</b>  15	<b>19a. NAME OF RESPONSIBLE PERSON</b> 412 TENG/EN (Tech Pubs)
<b>a. REPORT</b> Unclassified	<b>b. ABSTRACT</b> Unclassified	<b>c. THIS PAGE</b> Unclassified			<b>19b. TELEPHONE NUMBER</b> (include area code) 661-277-8615

# Air Force Flight Test Center

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## C-Band Working Group Update

Steve O'Neal 412 TW/TMGGB

**U.S. AIR FORCE**

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AFFTC-PA No.: XXXXX

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## Agenda

- C-Band Overview
- Spectrum Use Trends
- Why Use C-Band
- C-Band Current Utilization
- C-Band Implementation Resources
- Conclusions

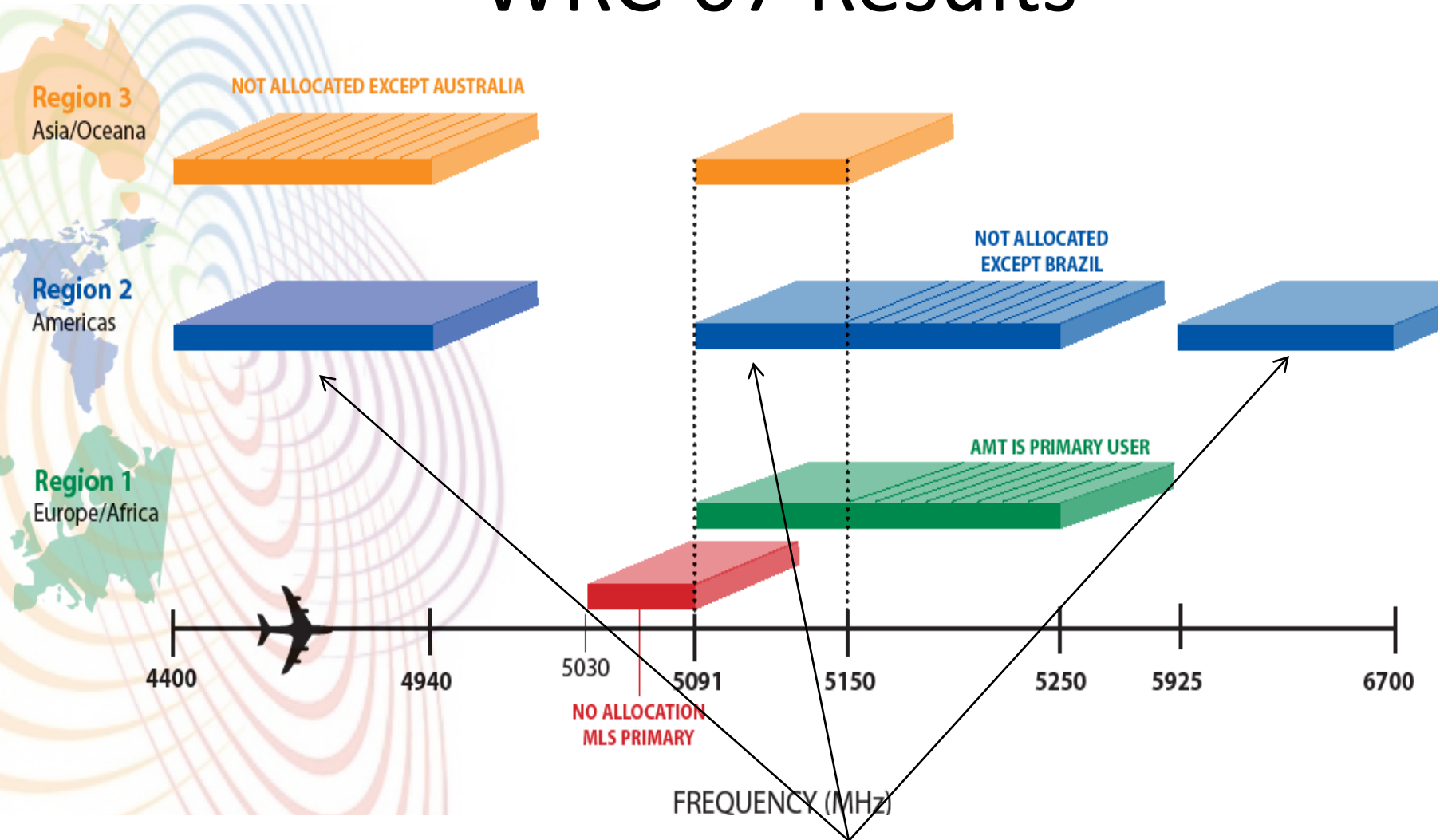
## C-Band Overview

- **World Radio Conference (WRC) 2007 approved a C-Band allocation for “Airborne Mobile Telemetry” (AMT)**
  - 4400 to 4940 MHz ITU Region 2
  - 5091 to 5150 MHz All ITU Regions
  - 5150 to 5250 MHz ITU Region 1
  - 5925 to 6700 MHz ITU Region 2
- **IRIG STANDARD 106-11, Chapter 2 defined C-Band as**
  - Lower C-band 4400 - 4940 MHz
  - Middle C-band 5091 - 5150 MHz
  - Upper C-band 5925 - 6700 MHz

Reference: [http://www.wsmr.army.mil/RCCsite/Documents/106-11\\_Telemetry%20Standards/chapter2.pdf](http://www.wsmr.army.mil/RCCsite/Documents/106-11_Telemetry%20Standards/chapter2.pdf)

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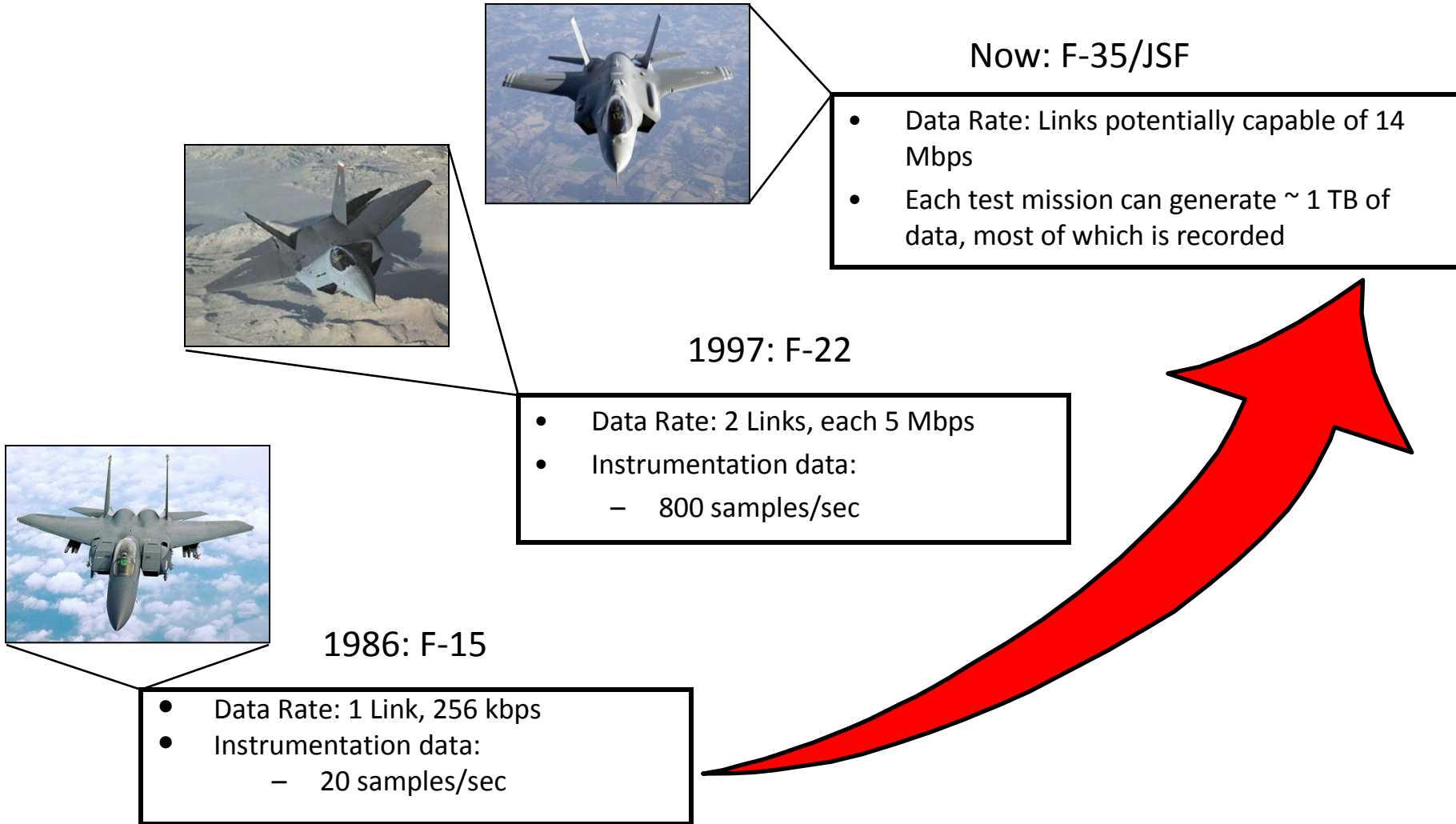
## WRC-07 Results



1.4 GHz of RF Spectrum Awarded to Support Aeronautical Telemetry

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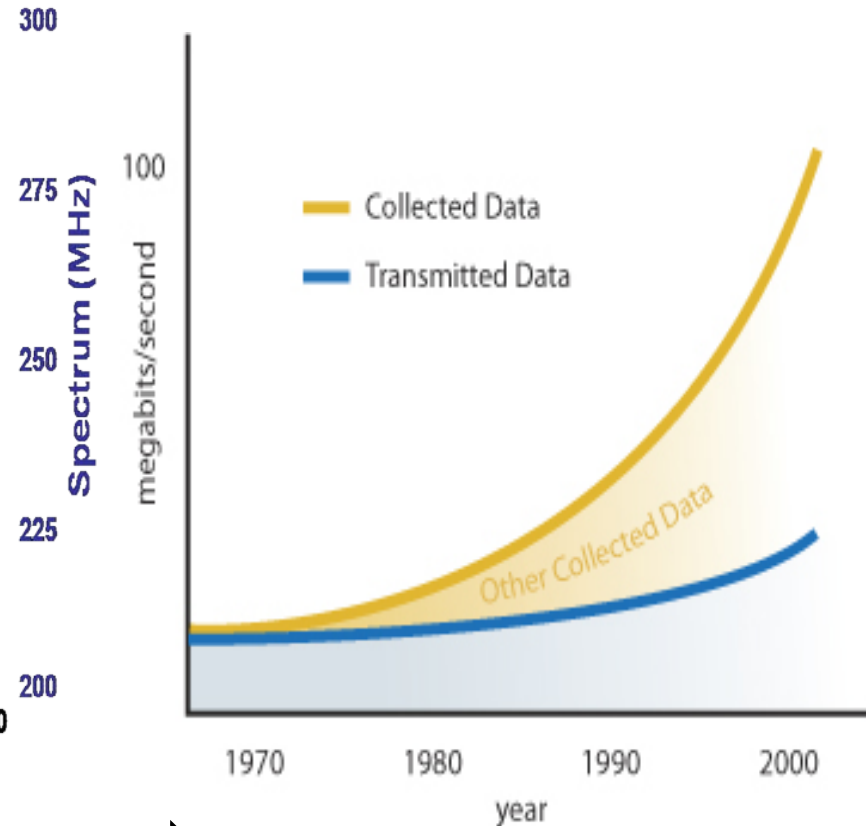
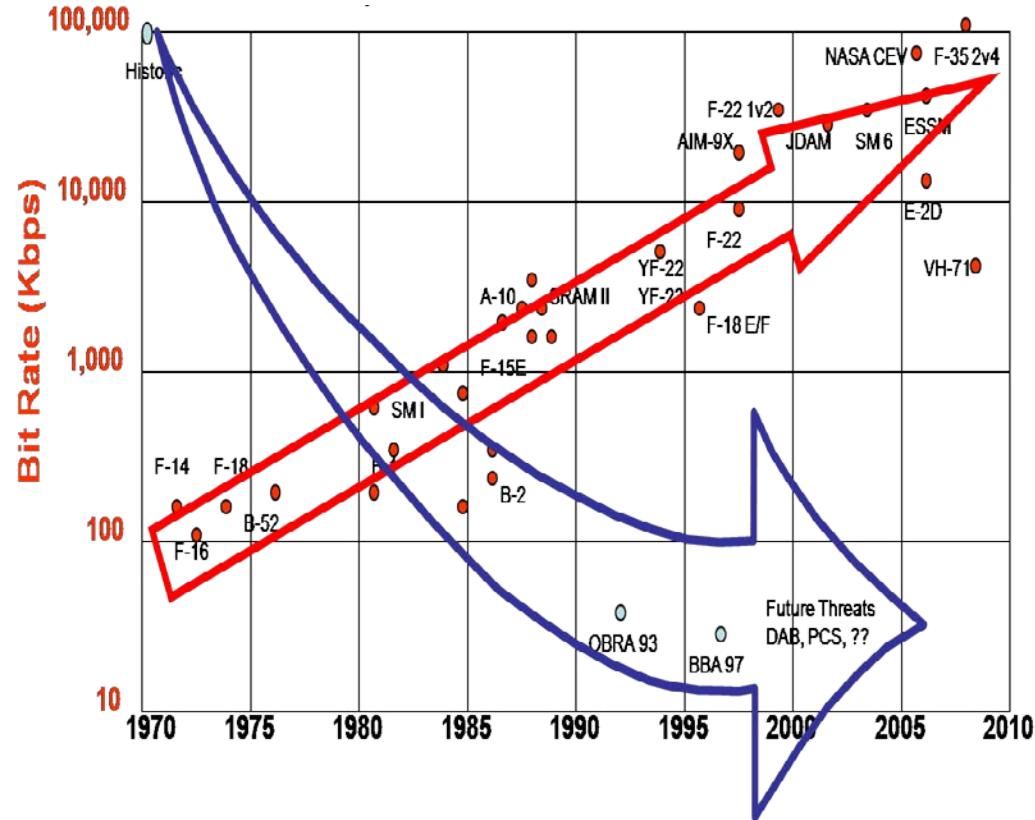
## Spectrum & Data Rate Trends



Increasingly complex systems have exponentially increased data rate

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## Spectrum & Data Rate Trends



Decreasing spectrum availability &  
Increasing system complexity

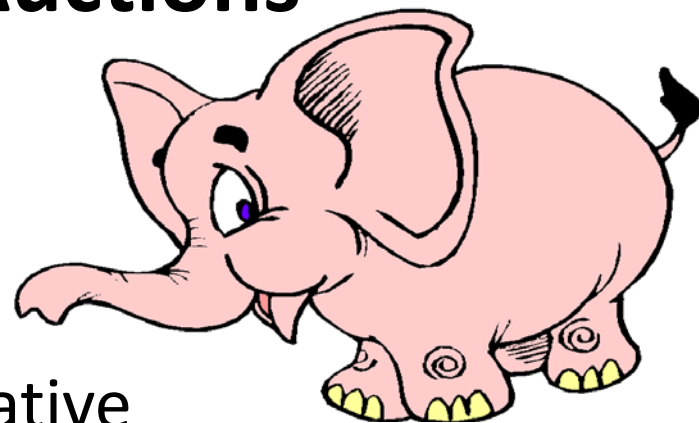
Leads to

Large amounts of data being  
recorded onboard the test  
platform

# Why use C-Band Now ?

- As a way to alleviate today's Spectrum congestion by augmenting operations using C-Band
  - T&E mission execution delays caused by L/S spectrum assignments constraints
  - Improve mission capabilities with services not possible using current L/S allocations
  - “Use it or loose it” ... Spectrum not being used is always a prime target for others who want additional spectrum
- Preparing for future spectrum auctions by experimenting with C-Band

# The “Elephant in the Room” Future Spectrum Auctions



- Pending Policy & Regulatory actions
  - FCC “*National Broadband Plan*”
  - President Obama’s 500 MHz Initiative
- 1755 to 1850 MHz relocation report just released
- Other DOD Spectrum allocations may (will?) be proposed for auctions
- Spectrum Auctions are here to stay

## Can C-Band be used **NOW?**

- Short answer **YES**
  - On any DOD *Major Range and Test Facility Base (MRTFB)*
    - National Telecommunications and Information Administration Agency (NTIA) Regulations, Paragraph 7.11 “Use of Frequencies by Certain Experimental Stations”
  - On any non-DOD MRTFB using “Temporary” assignments
    - FCC currently working with NTIA to formalize allocations allowing permanent assignments in *Manual of Regulations and Procedures for Federal Radio Frequency Management (Redbook)*

## Who is using C-Band now ?

- United States Navy
  - PAX River
    - Carrier Suitability Test telemetry
    - Rotary Wing testing telemetry
- United States Air Force
  - Edwards AFB
    - Test Pilot School support telemetry
    - Foreign Military Sales support telemetry
  - Eglin AFB
    - Ground mobile target vehicles video links

# C-Band Implementation Resources

- Working Group(s)
  - Range Spectrum Requirements Working Group
  - **Test Resource Management Center (TRMC) C-Band Working Group**
  - Missile Defense Agency C-Band Working Group
  - Raytheon C-Band Working Group
- TRMC C-Band Working Group
  - Monthly Telecons discuss current C-Band test results and Range Peer C-Band activities
  - Bi-Annual Face to Face Meeting held day prior to RCC/Telemetry Group meeting
  - On Line Information Portal (DOD ONLY)

## C-Band Implementation Resources cont.

### C-Band Deployment experts

#### – AFFTC/Edwards AFB

- Kip Temple, Instrumentation Systems
  - (661) 527-1604
- Robert Selbrede, Range Systems
  - (661) 527-1179

#### – AAC/Eglin

- Nathan King, Range Systems
  - (850) 882-3248

#### – NAVAIR/PAX

- Robert Myers, Range Systems
  - (301) 342-8739
- Bruce Johnson, Instrumentation Systems
  - (301) 342-3816

## Conclusions

- C-Band Spectrum Assignments to support aeronautical Applications are available **NOW** !
- C-Band performance is very similar to S-Band
- C-Band implementation resources are available to assist anyone investigating use of C-Band to support T&E missions