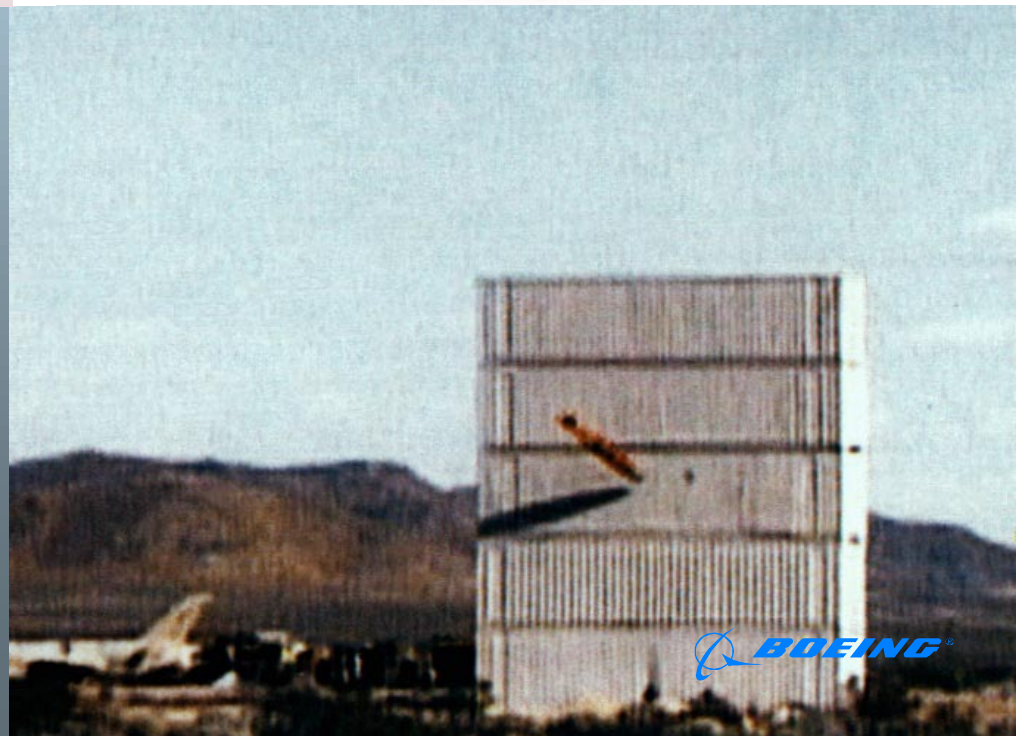


# **JDAM**

## **The Kosovo Experience and DPAS**

**Charles H. Davis**  
The Boeing Company





## Why JDAM?



### Operation Desert Storm:

- Pilots noted IR, EO, laser seriously degraded by clouds, rain, fog, smoke
- Air superiority allowed U.S. commanders to use medium- and high-altitude strike tactics maximizing survivability
- Higher altitudes reduced accuracy, leading to reduced effectiveness, higher costs from additional restrikes
- Current guided weapons are expensive

Source: *Operation Desert Storm: Evaluation of the Air War*, GAO Report PEMD-96-10



# Advantages to the Warfighter



- Day/Night/ Adverse Weather Capability
- GPS Accuracy
- Fire and Forget
- In-Flight Captive Carriage Retargeting
- Multiple Targets per Sortie
- Aircraft Carrier Compatibility
- Affordable



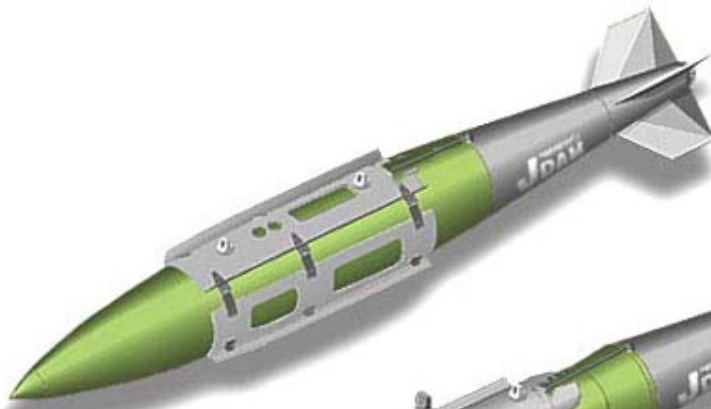


# JDAM Weapon Family

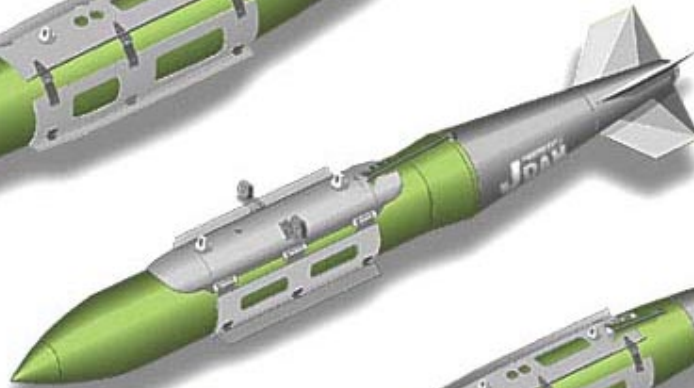


Affordable, Accurate, Autonomous Adverse Weather

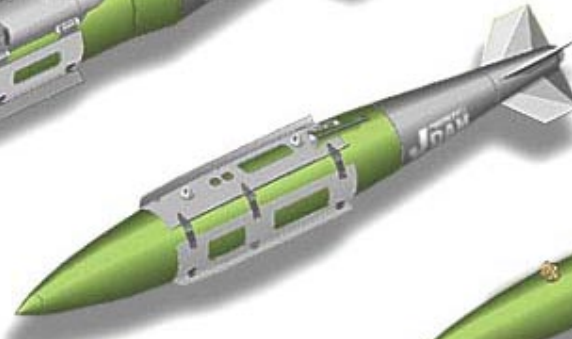
**Mk-84**



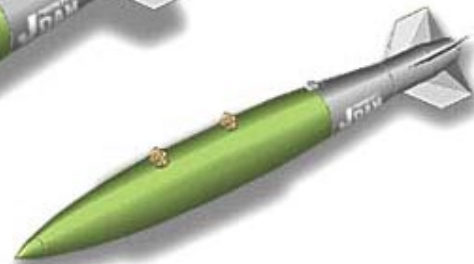
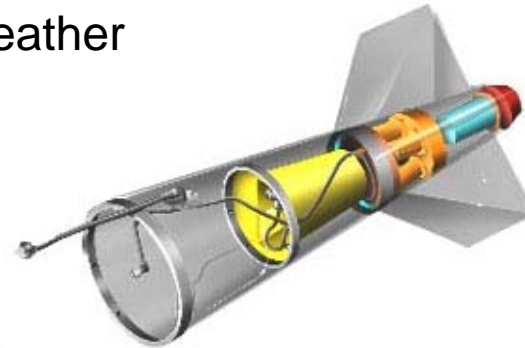
**BLU-109**



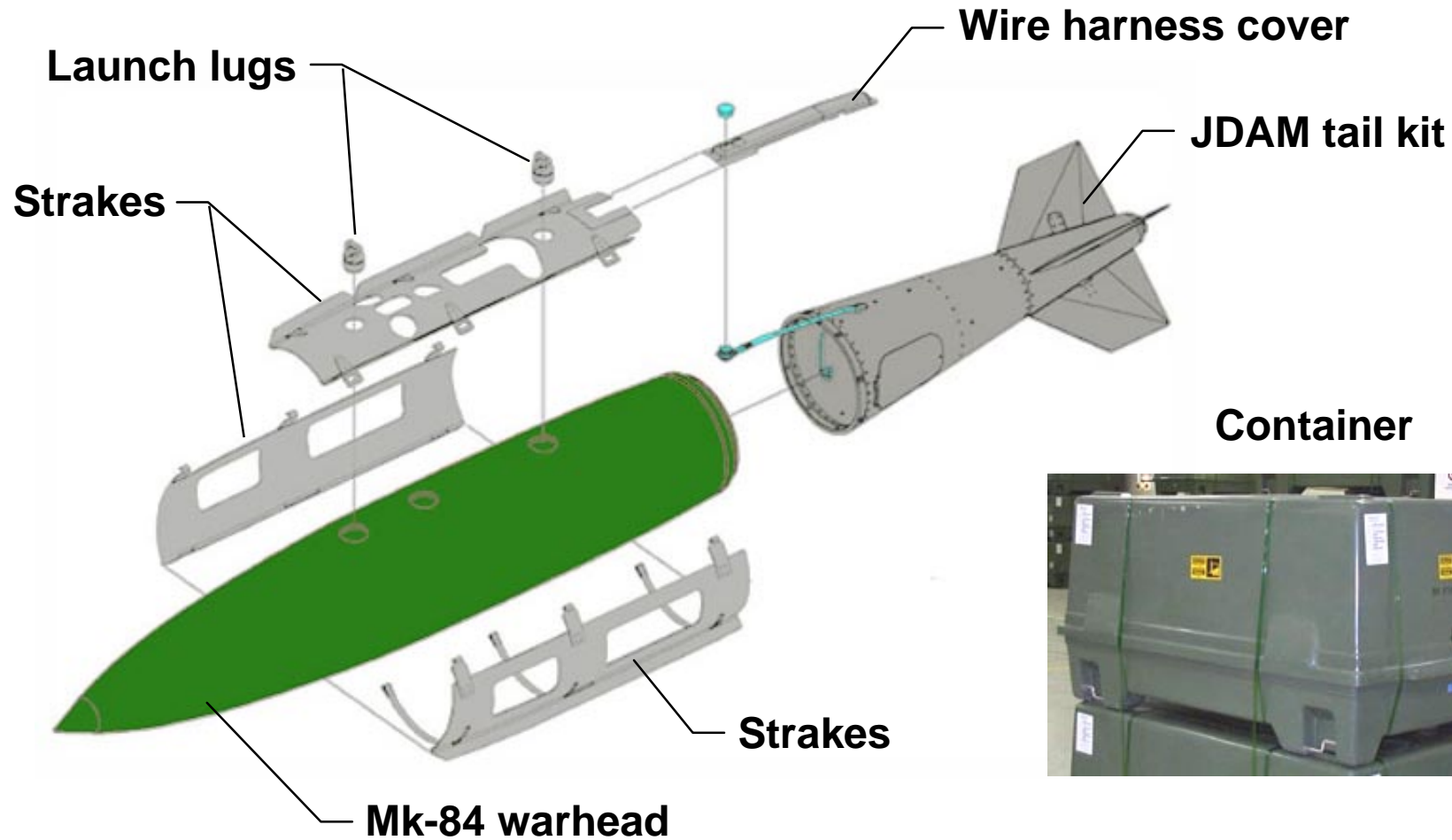
**Mk-83, BLU-110**



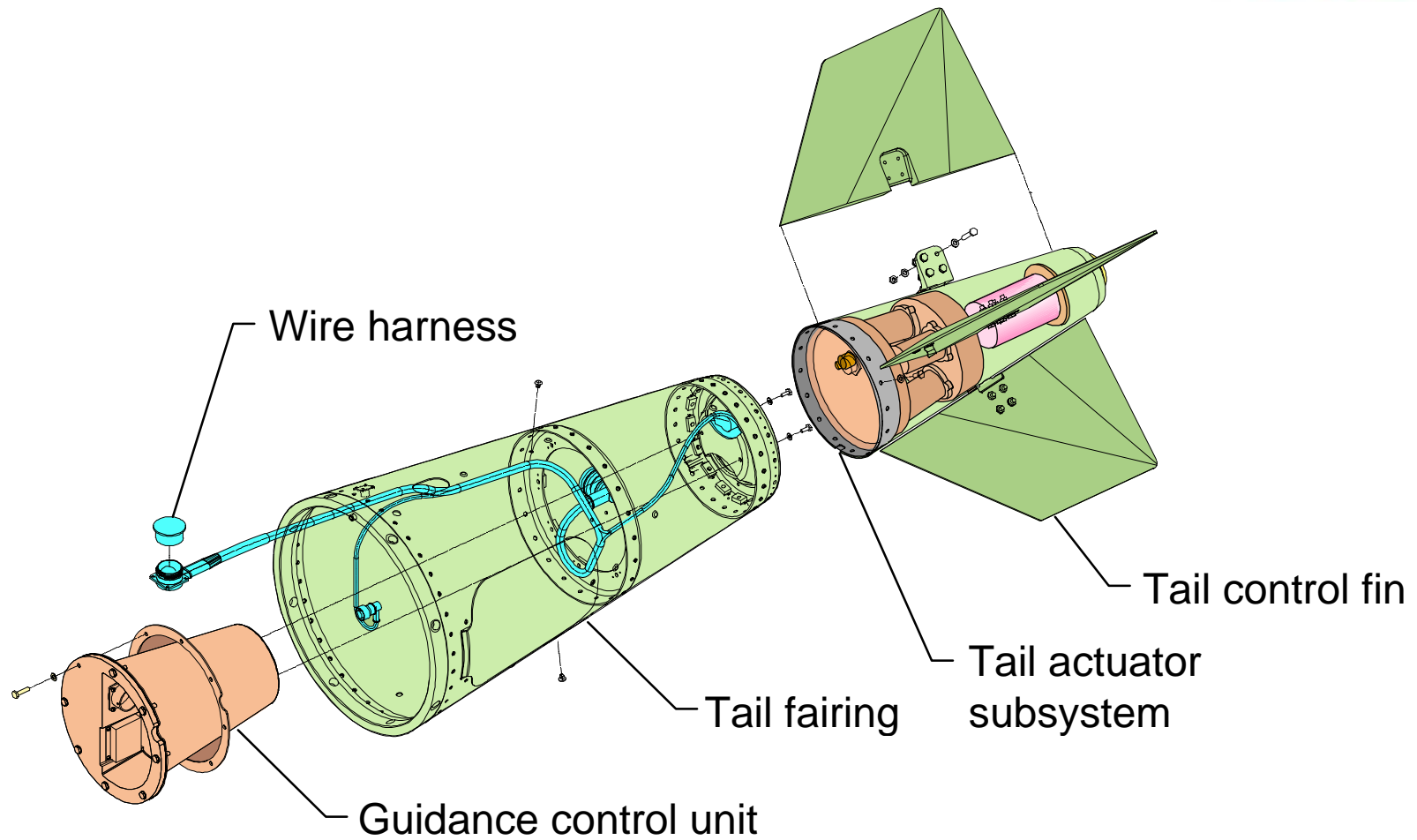
**Mk-82  
(Commercial Development)**



# Joint Direct Attack Munition Kit Mk-84 Warhead

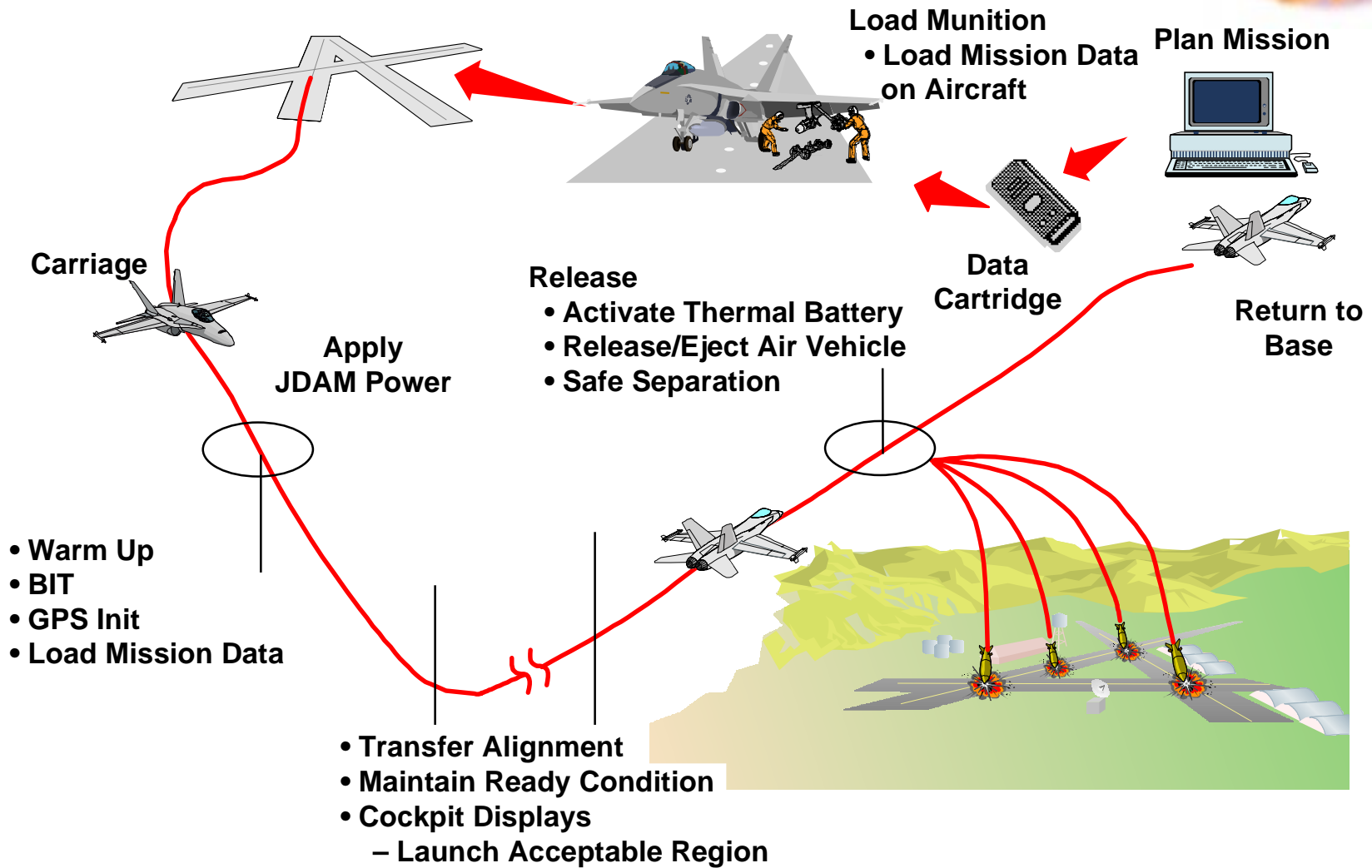


# JDAM Tail Kit





# JDAM Concept of Operations



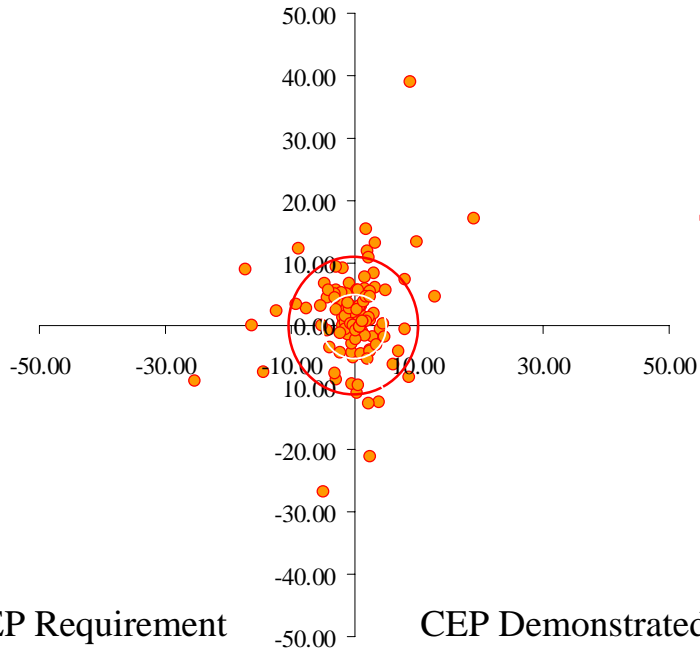
# JDAM ACCURACY

GPS-AIDED HORIZONTAL TARGETS



## Test CEP (Surveyed Target - No TLE)

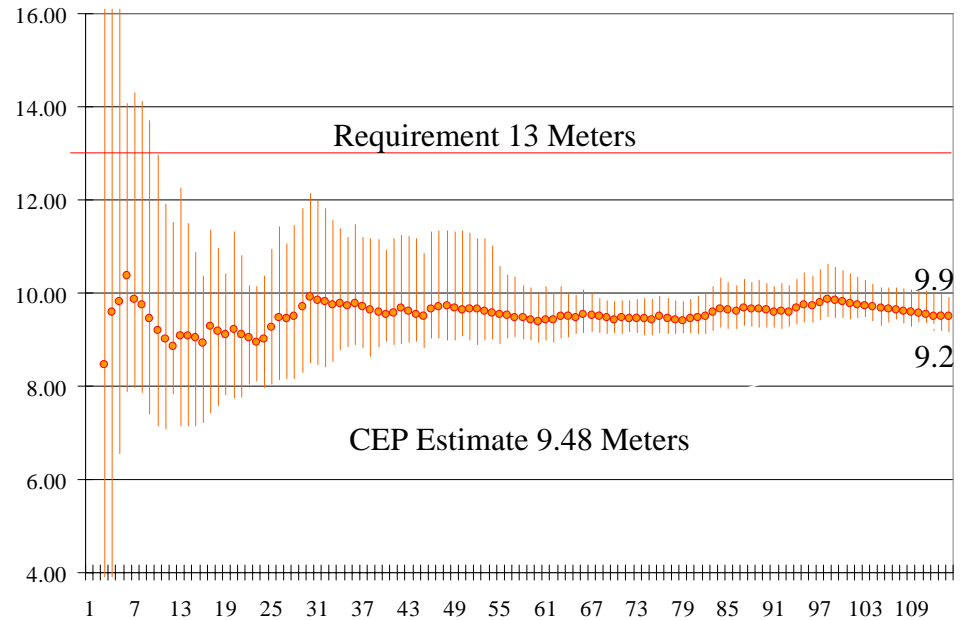
- Surveyed Impact Point (TLE=0)



CEP Requirement  
10.8 Meters

CEP Demonstrated  
5.1 Meters

## Operational CEP Estimate (With TLE)



95% Confidence  
True CEP is 9.2 - 9.9 Meters

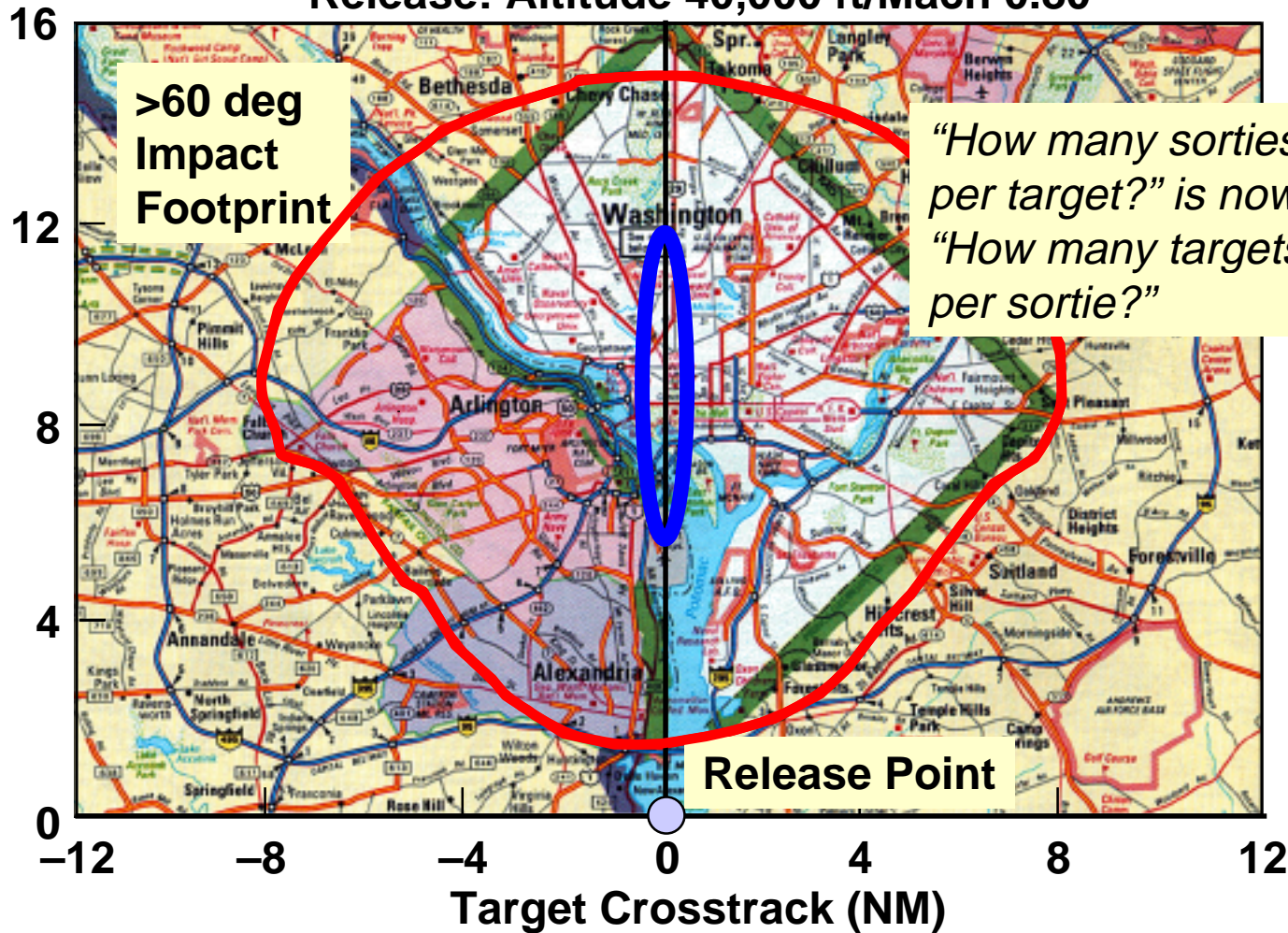




# JDAM Revolutionized Strike Warfare








Release: Altitude 40,000 ft/Mach 0.80



# JDAM Flight Test Activity

31 Jan 00



	Separation Tests	Captive	Guided Launches
<b>F/A-18C/D</b> DT, DT/OT & OT 	19 MK-84 9 BLU-109 4 MK--83	28 Flights (11C) 68 Flights (13C) 1 Flight (13E) 7 Flights (15C)	82 MK-84 * 41 BLU-109 * Includes 1 DAMASK Asset 123
<b>B-52H</b> DT, DT/OT, & OT 	7 MK-84 9 BLU-109	9 Flights	43 MK-84 24 BLU-109 67
<b>B-1B</b> DT, DT/OT & IOT&E 	11 MK-84 3 BLU-109	10 Flights	23 MK-84 17 BLU-109 40
<b>F-16C/D</b> DT, ISE & Block 50 	7 MK-84 4 BLU-109 10 Mk-83	49 Flights	50* MK-84 22 BLU-109 17 MK-83 89
<b>B-2A</b> DT, IOT&E, & EOC 	1 MK-84 2 BLU-109	7 Flights	82 MK-84 54 BLU-109 136
<b>Totals</b>	45 MK-84 27 BLU-109 = 89 STVs 14 MK-83	179 Flights	280 MK-84 158 BLU-109 = <b>455*</b> GTVs 17 MK-83

\* Includes One (1) LAT Asset

4/19/00

# Follow-on Aircraft Integration



	CY 1999	CY 2000	CY 2001	CY 2002
F/A-18E/F	DT			
F-16 M2+, Bk 40T6	DT			
F-16 Block 30		DT OT	DT OT	DT OT
F-14B	Development	DT OT		
F-14D		Development	DT OT	
F-15E		Development	DT	OT
F/A-18C/D MK-83		DT OT		
F-22 MK-83	Development			DT
AV-8B	Development			DT



# Why JDAM?



## Because:

- **Pilot Doesn't Need to To See Target**
  - Can Use JDAM Through Clouds, Rain, Fog, Smoke
- **JDAM Accuracy Independent of Release Altitude**
  - Can Release JDAM From Higher Altitudes and Off-Axis for Greater Survivability
- **Multiple Kills per Pass + Fire and Forget**
  - Fewer Sorties, Greater Standoff = Less Risk, Less Cost
- **JDAM is Affordable!**





# JDAM

*"Has Revolutionized Strike Warfare"*



# Combat Proven JDAM Accuracy



Source: DoD Photograph

# JDAM - Operation Allied Force





# JDAM - Operation Allied Force

Pre Strike



# JDAM - Operation Allied Force

Post Strike



# JDAM - Operation Allied Force



**BELGRADE FEDERAL MINISTRY INTERNAL AFFAIRS, SERBIA**

**POST STRIKE**





# JDAM Performance Summary



- **JDAM Weapon System Has Shown Good Performance in DT, DT/OT, Operation Allied Force & Southern Watch**

- **Storage Reliability  $\geq 98\%$  and  $\geq 95\%$  Mission Reliability**
  - 651 Launches in Kosovo
  - >20 Launches from F/A-18 in Southern Watch
  - >450 Guided Test Launches



- **Excellent All-Weather Accuracy Demonstrated in Kosovo and in Test**



# JDAM Production Surge

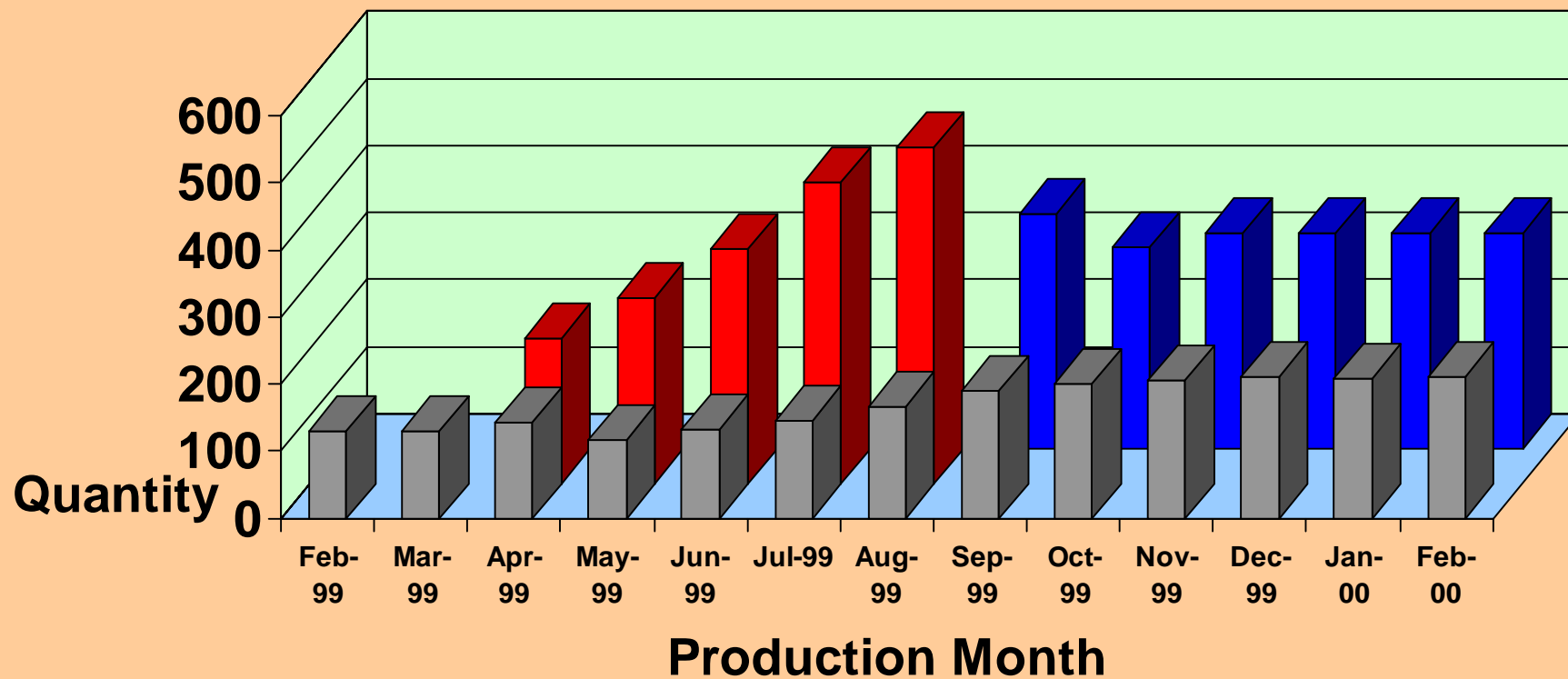


- **Went From a Production Rate of 130 Kits/Month to a Peak Rate of Over 450 Kits Per Month**
  - 5 Contract Mods in 2 Months
- **Delivered 1320 Kits in Less than 4 Months**
  - 1000 Kits 6 Months Earlier Than Original Contract Requirement
- **Critical Enablers**
  - Tightly Integrated Supplier Base
  - DPAS Interaction with Subtier Supply Base



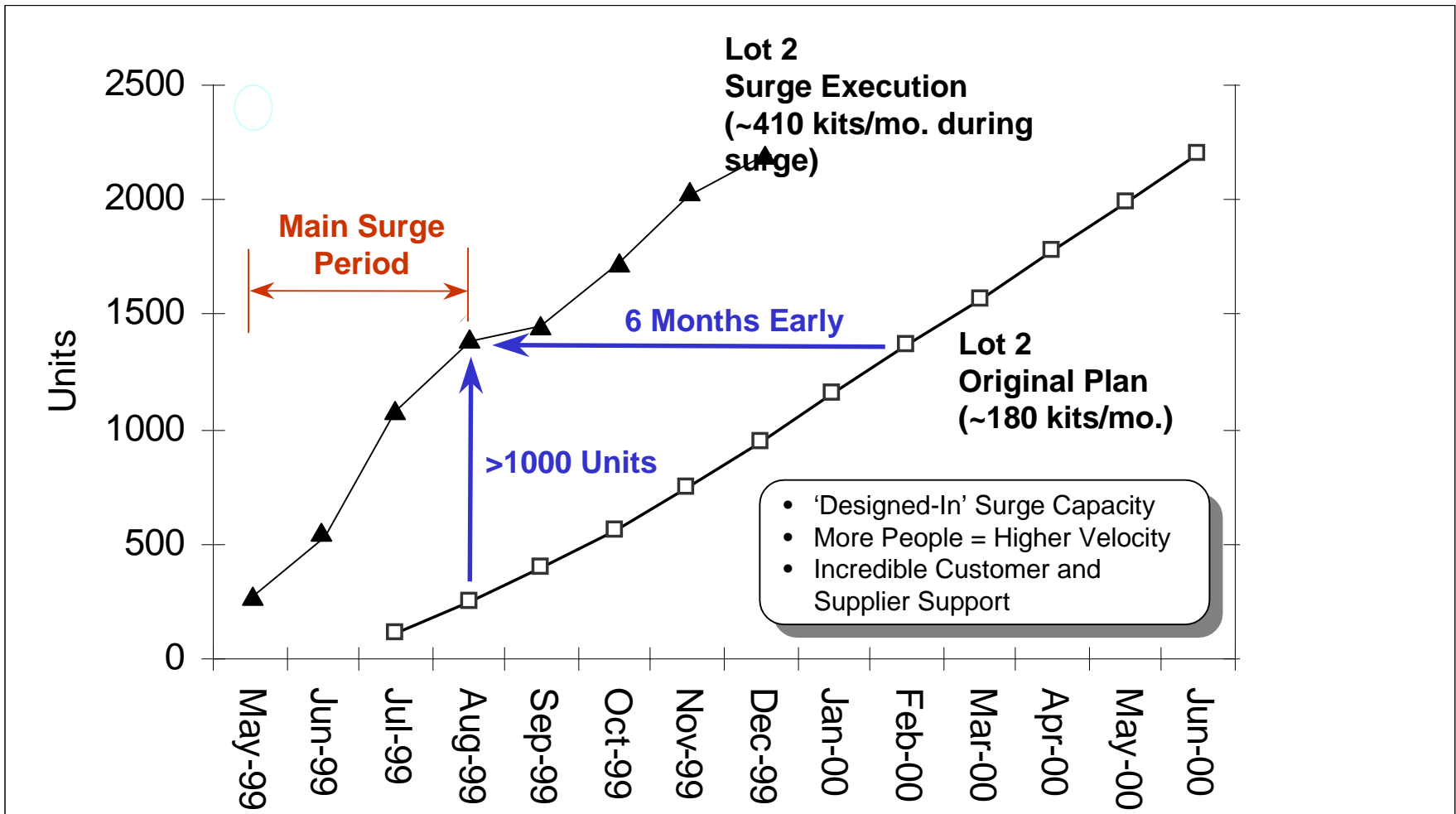
- **Post Kosovo Activity**
  - **On Contract for ~ 16,000 JDAMs**
  - Accelerated Schedule and Increased Quantities
  - Production Rate Ramp to 700 Kits/Month in Spring of 2001

# JDAM Production Acceleration

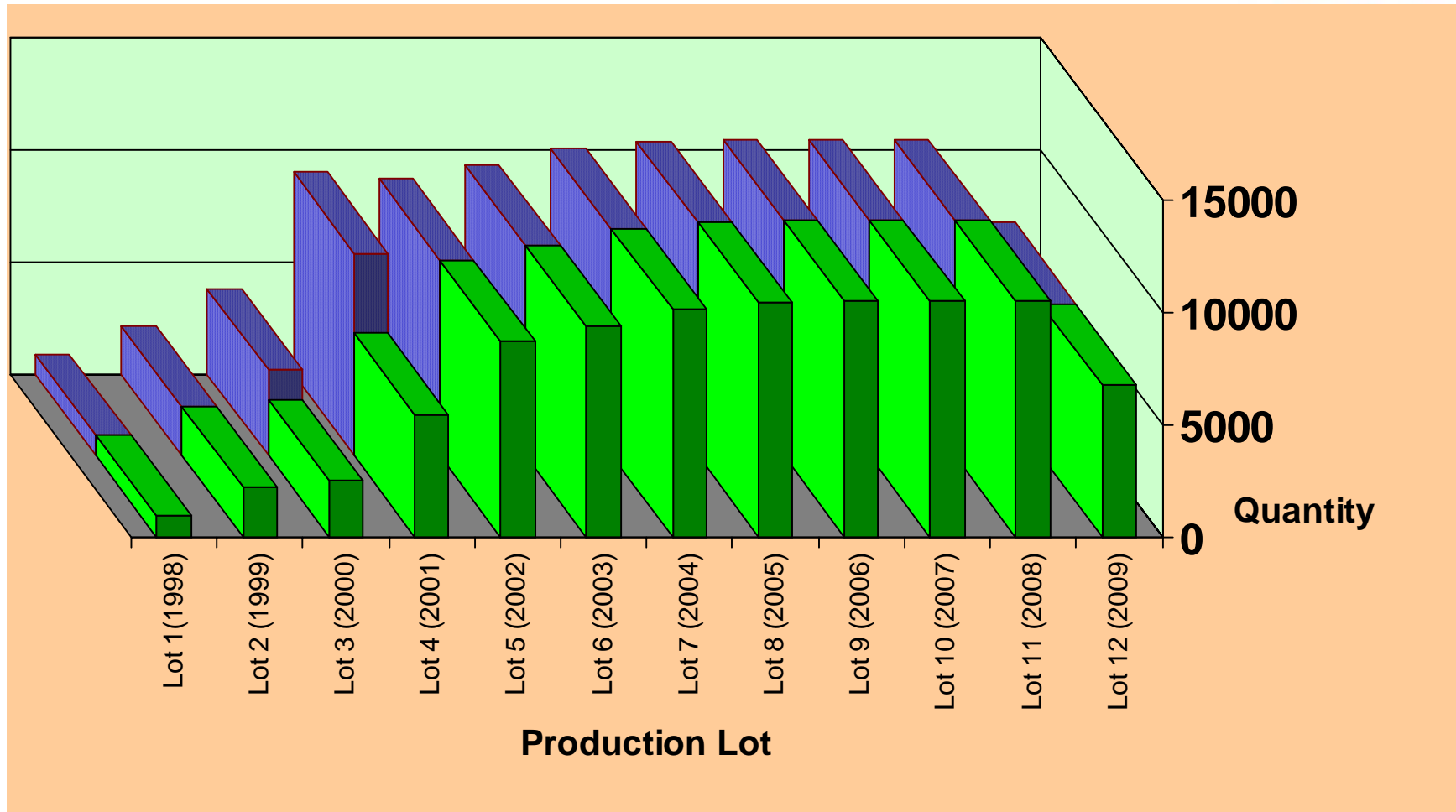


■ Baseline ■ Kosovo Surge ■ Post Kosovo

# Operation Allied Force Support



# JDAM Production Quantities

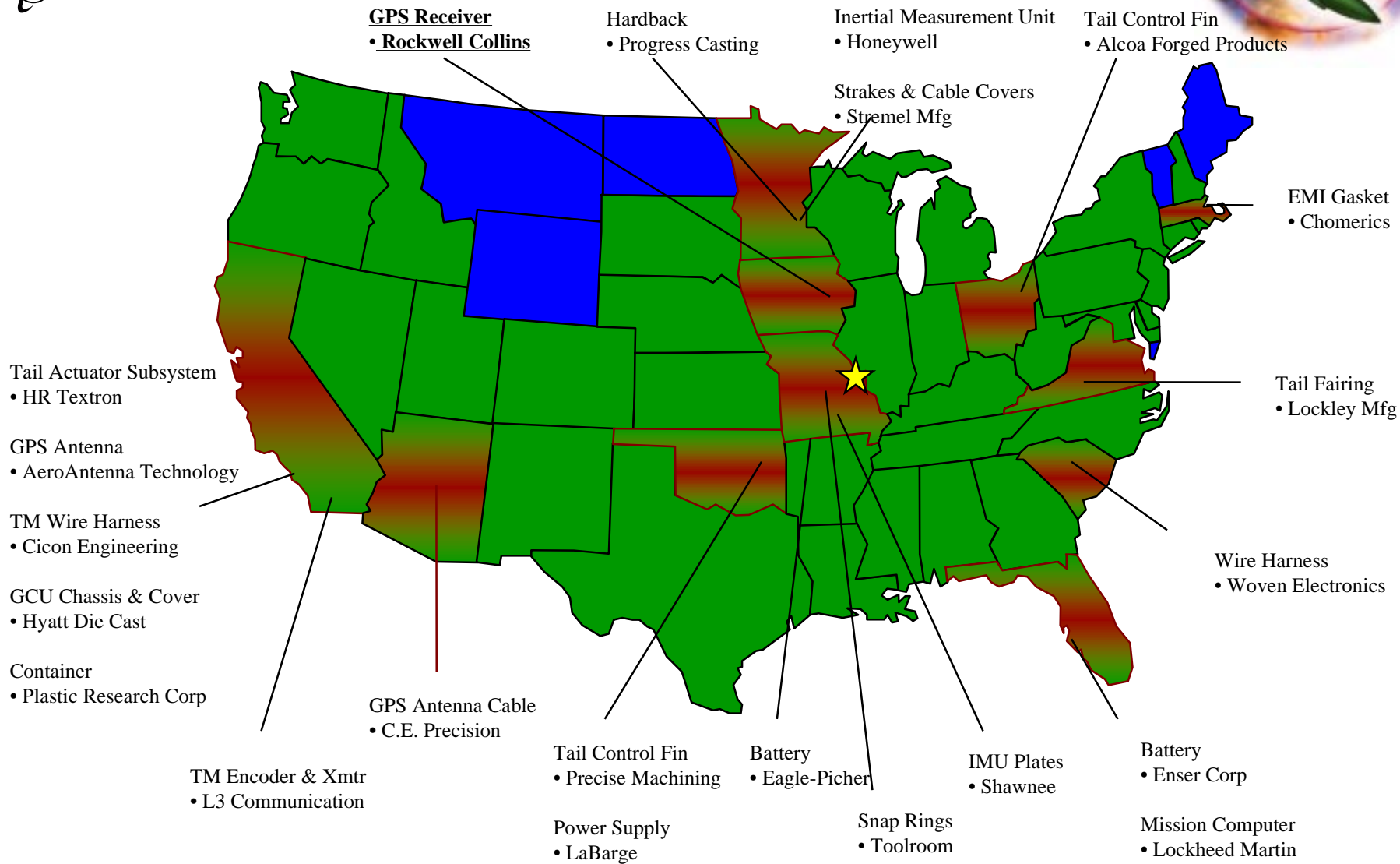


■ Baseline ■ Post-Kosovo





# JDAM, USA





# JDAM and DPAS



- **Schedule Acceleration Drove Necessity to Pursue Special Priorities Assistance Through DPAS**
  - Defense and Emergency Preparedness
- **Coordination with Department of Commerce DPAS Program Manager to Determine Which Suppliers Required Assistance**
- **Directives Issued to Those Suppliers Identified**
- **Continuous Communication and Coordination Maintained Throughout the Critical Need Period**
  - JDAM SPO, DPAS Program Office, Boeing, Suppliers and Subtier Suppliers

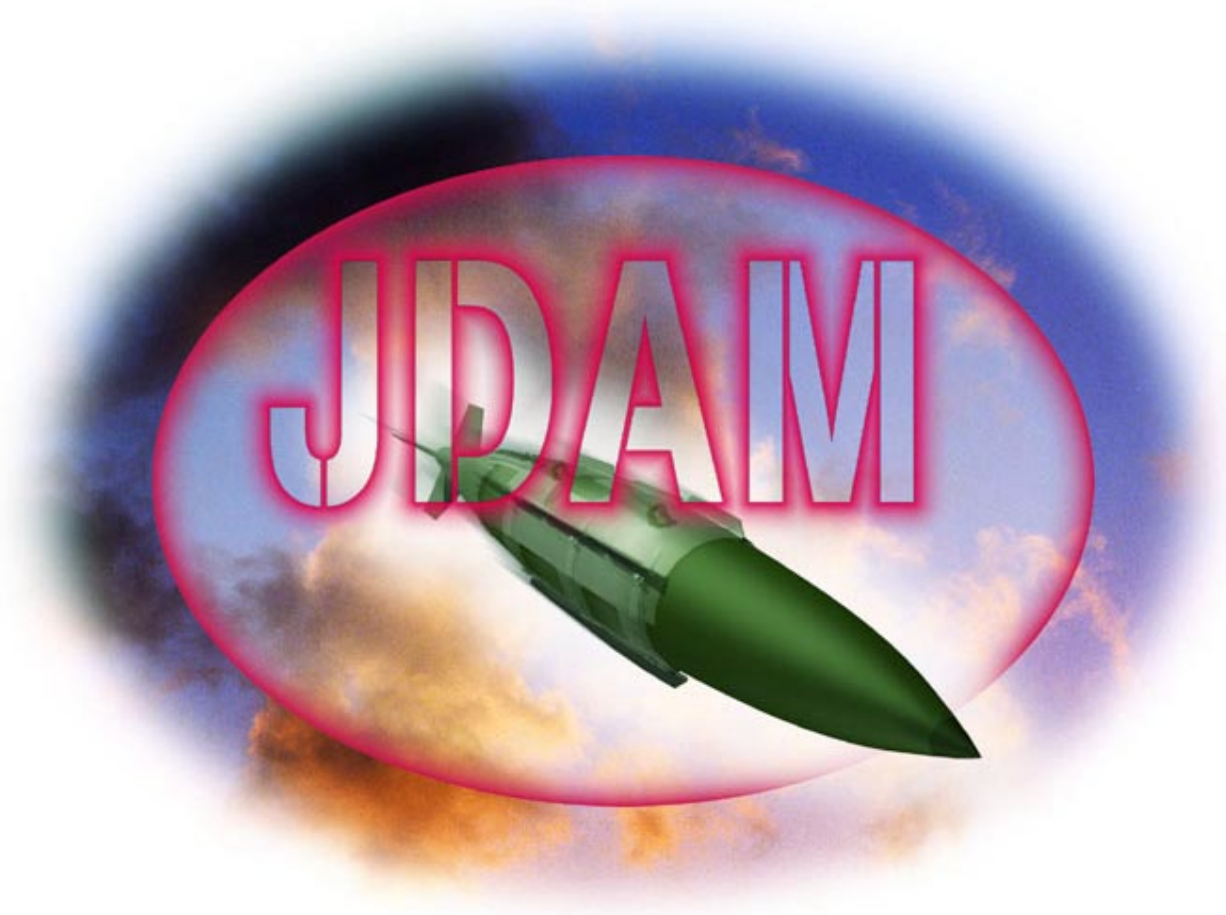


# Lessons Learned



- **Connectivity Between The Prime, The Subcontractor and The Subtier Supplier Must Be Sound and Effective**
- **Increase Familiarity with DPAS Requirements and Capabilities Throughout Supply Chain**
- **Commercial Parts are Subject to Competitive Dual Use Utilization Pressures**
- **Understand Limitations with International Subtier Suppliers**

**DPAS is a Valuable Resource Upon Whom the Contractor Can Call When a Priority Assistance Need is Identified**



JDAM