

# Capturing Behavioral Influences in Synthetic C2

Doug Flournoy

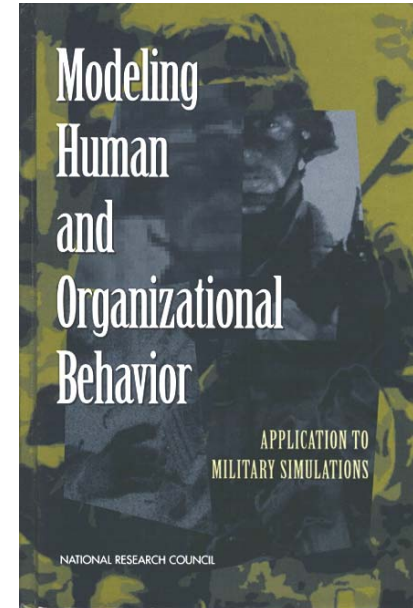
781-271-4970 • [rflourno@mitre.org](mailto:rflourno@mitre.org)

Air Force MOIE



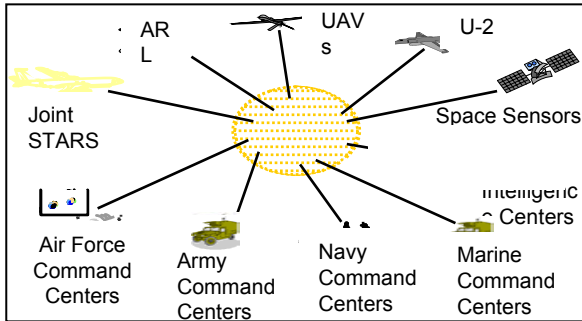
# Problem

- We do quite well at simulating the physical aspects of C2 (sensors, networks, etc.); behavioral representations pale in comparison
  - *Further research/application of HBR methods can address this deficiency*
- National Research Council (NRC) study urges investment in behavior modeling technologies
  - *Users of military simulations cite weaknesses in human behavior representations, especially in C2*



# Background:

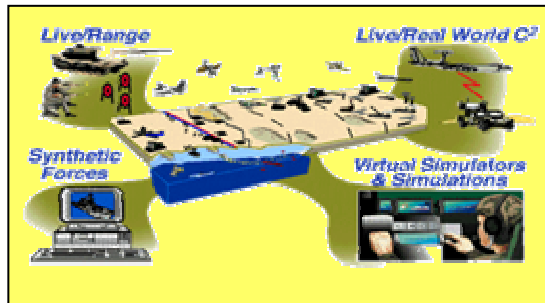
## Strengthening C2 Development



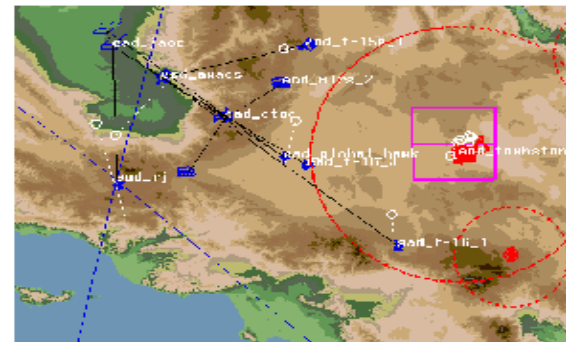
**Operations Analysis**  
**SIAP**



**Man-in-the-Loop Experimentation**  
**JEFX, VSWE, JSB, CAOC-X**



**"Train As We Fight"**  
**NASM/JSIMS**



**Embedded Decision Aids**  
**AMASS**

# Objective

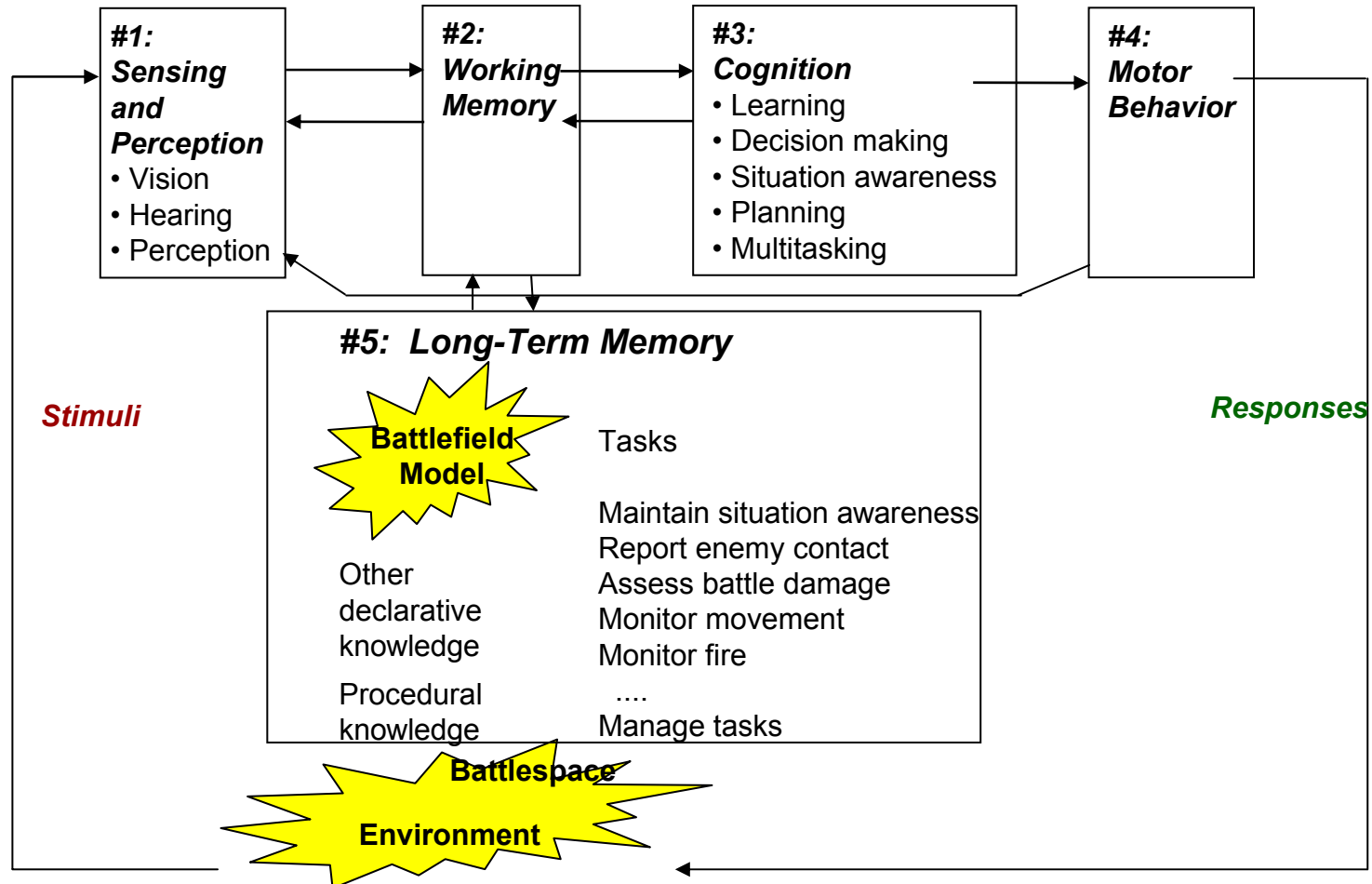
- **Strategic objective: determine the potential for Human Behavior Representation (HBR) technologies to *deliver better C2* by strengthening:**
  - operations analysis
  - decision aids
  - man-in-the-loop experimentation
  - training
- **Initial thrusts:**
  - Evaluate HBR modeling frameworks for C2 applications
  - Develop and experiment with a C2 operator model (JSTARS Surveillance Operator)

# Activities

- **Perform JSTARS operator Cognitive Task Analysis (CTA)**
- **Obtain/Assess HBR toolsets**
- **Develop JSTARS Operator Surrogate Human (JOSH)**
- **Integrate JOSH into synthetic battlespace**
- **Perform iterative experimentation**

# Highlight:

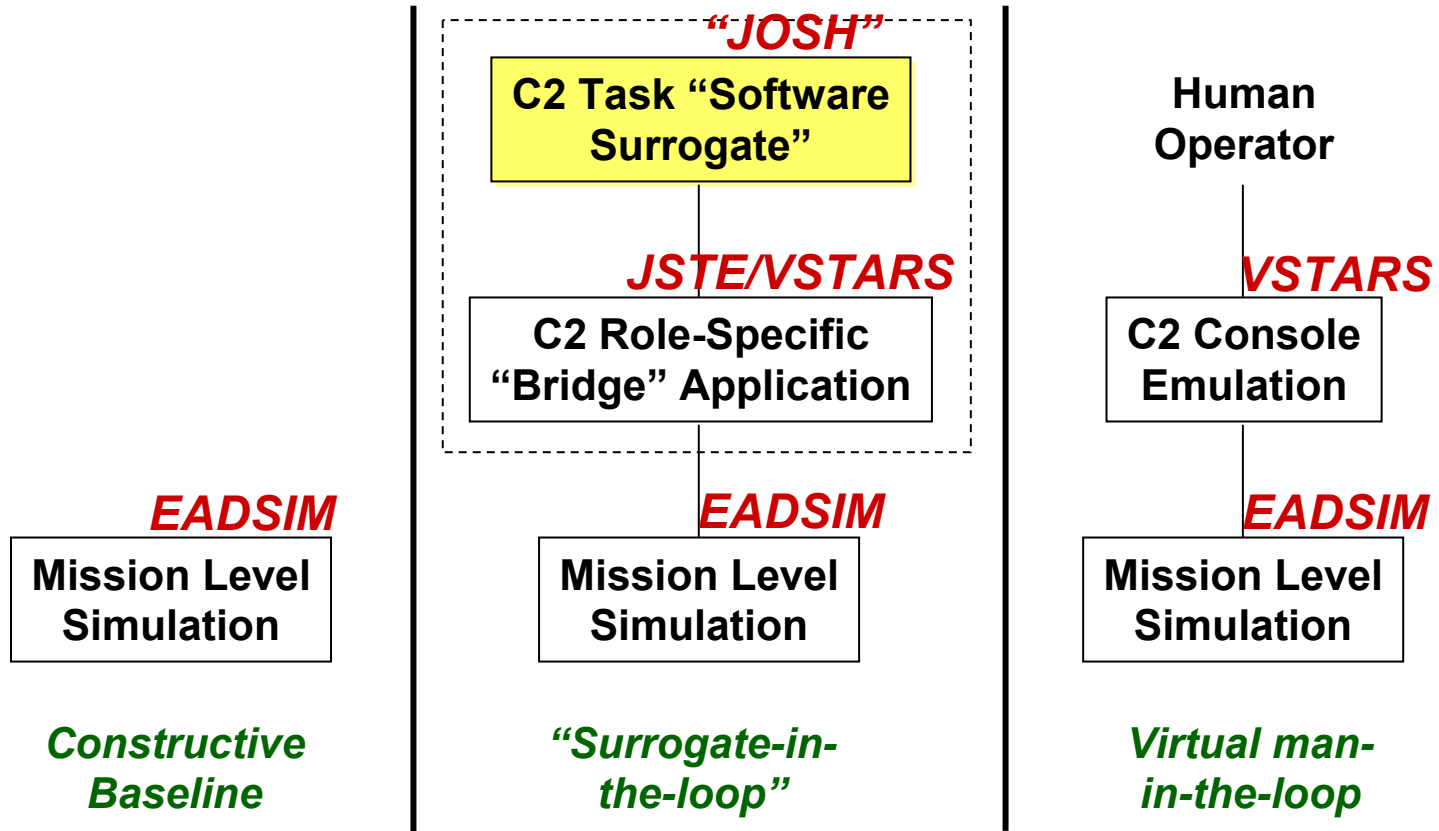
## Five Components of Behavior



Several commercially available modeling applications

- Differ in emphasis on the 5 human behavior components

# Highlight: Experimentation Approach



<b>JOSH</b>	JSTARS Operator Surrogate Human
<b>JSTE</b>	Joint STARS Transportable Emulator
<b>VSTARS</b>	Virtual Surveillance and Target Attack Radar System
<b>EADSIM</b>	Extended Air Defense Simulation

# Impacts

- **Improve modeling of “human element” in C2**
  - Strengthens analyses (SIAP), decision aids
  - Builds understanding of operator decision performance, strengths & limitations
- **Develop software surrogates that can perform single C2 operator tasks**
  - Extend/enhance MITL experimentation (JSB, VSWE, JEFX, CAOC-X)
  - ~~Reduce staffing requirements to support large~~  
~~batch staff training requirements (JSIMS)~~

*Opportunity to join now with AFRL & others to realize a C2 modeling breakthrough, while learning valuable lessons to strengthen ESC efforts*

# Future Plans

- Expand from individual operator models to collaborative team operations

– Candidate mission areas:

- JSTARS
- TCT Cell
- MC2A
- ...



- Explore executable architectures “connection”

