

AIR UNIVERSITY

iC2

*Advancing our Understanding of
Command and Control*

We Produce the Future

**Presented By:
Team Falcon**



Redefining the Problem

Develop America's Airmen Today ... for Tomorrow

How can we develop an Air Force CONOP that is built to provide a Global Network Command and Control (C2) Infrastructure to link sensors-to-effects?

Assumptions

The Air Force is the first to respond to a contingency event

Multi-domain operations demand cross-domain synergy

The ultimate solution to Global Network C2 Infrastructure is at the national level

In order to develop an Air Force CONOP capable of providing Global Network Command and Control linking sensors-to-effects, the Air Force must **expand the basic doctrinal understanding of C2.**



Defining C2



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Joint Publication 1-02

The exercise of authority and direction by a designated commander over assigned forces in the accomplishment of the mission



Defining iC2



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Expanded Definition

The exercise of authority, direction, **and influence** by a designated commander over **available forces and across all domains** to accomplish the mission

Influence: The capacity to leverage capabilities outside traditional command structures



The Current Model

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C2 as “Formal Control”



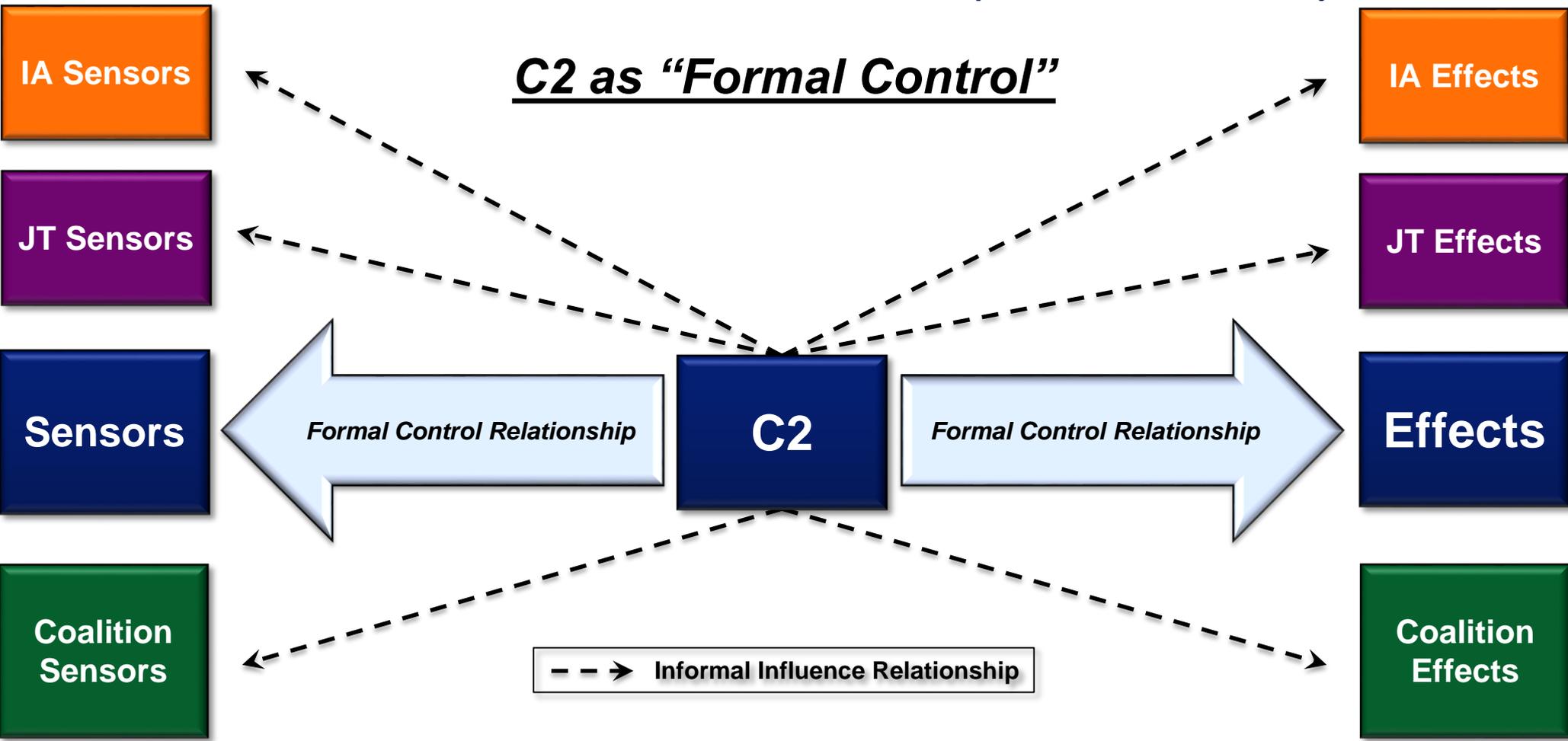
Does C2 extend beyond these formal control relationships (hierarchy)? If not, should it?



The Current Model

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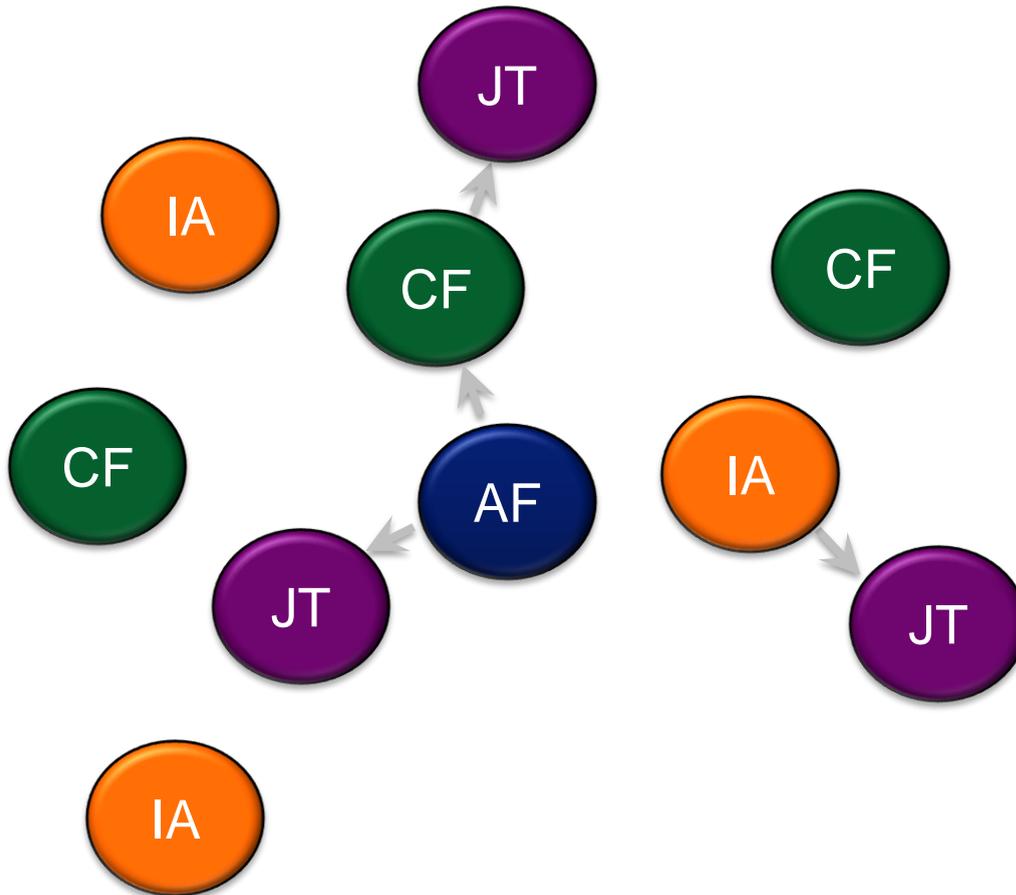


The Current Model

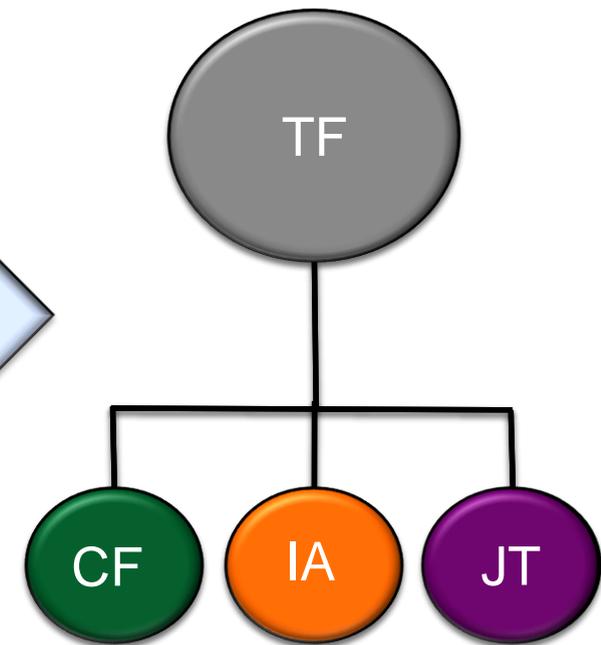
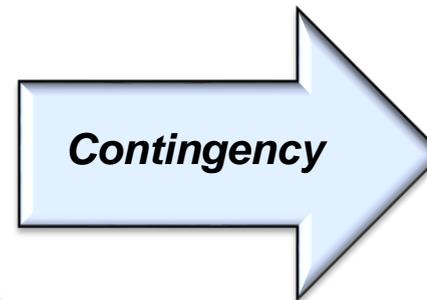


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Loosely Coupled Movement



Tightly-Coupled Group



The reliance on a Tightly-Coupled Group to fully leverage joint, interagency, and coalition interoperability restricts our adaptability and places our operations in a reactive setting limited by our capability to predict future events.

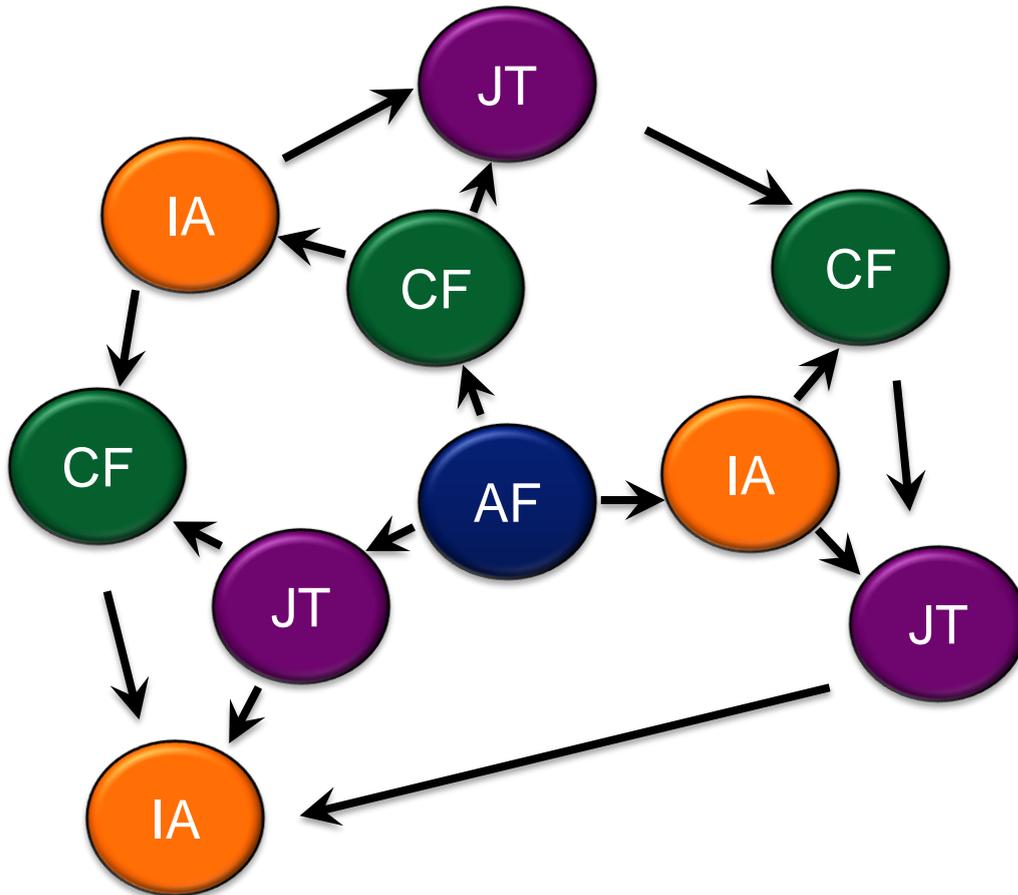


The Future Model – iC2

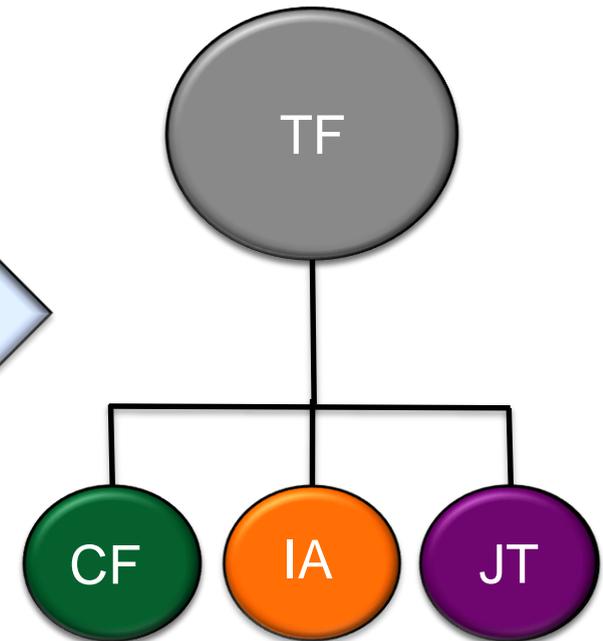
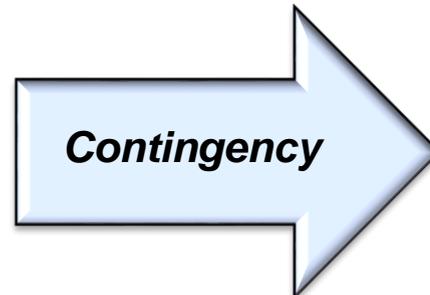


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Coupled Network



Tightly-Coupled Group



Reduce the time required to effectively respond to a contingency
Expand the potential sensor/effect options available to Commanders
Empower decision-makers at the lowest level



iC2 Way-Ahead



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Doctrine

C2 Expanded

Influence Recognized



People

LNOs

Training

Crossflow



Systems

Datalinks

Proactive

Rapidly Scaled



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Questions?



Sources



Develop America's Airmen Today ... for Tomorrow

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- Joint Publication 3-08, *Interorganizational Coordination During Joint Operations*, June 2011
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- *C2 Rising: A Historical View of Our Critical Advantage*, August 2014
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- *A Military Guide to Terrorism in the 21st Century: Terrorist Organizational Models*, August 2007
- *Groups, Networks, or Movements: A Command-and-Control-Driven Approach to Classifying Terrorist Organizations and Its Application to Al Qaeda*, June 2005
- *Cross Domain Synergy: Advancing Jointness*, June 2014
- *The Army's "Organic" Unmanned Aircraft Systems*, June 2009



Backup Slides



Personnel/Training Solutions



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How do we train Airmen in an academic setting to understand the role of influence in C2 and, importantly, how do we empower Airmen to utilize influence in an operational setting?

- **Utilize USAFWS Graduate as school model for “Influence Officer” training**
 - Unwritten influence exists between Graduates’ “Bro Network”
 - USAFWS Graduates still vital players and embedded in squadrons as SMEs. Integration Officer concept embeds across various platforms, domains and Mission Design Series (MDS)
- **Integration/Crossflow models used in Civilian Sector**
 - Southwest Airlines has developed the “Emerging Leaders Development Program” (ELDP) in which individuals are hand selected to receive training and perform rotational job programs in departments outside their sphere of influence
 - Graduates of this course use their knowledge and new connections as mid-level managers, essentially linking “sensors to effects” by making decisions of benefit to both the Company and to the Customer as well
- **Integration training should start at lower levels than the strategic level**
 - Experts in the field at both the operational and tactical level must be better taught to integrate
 - The LNO program must be updated to reflect quality personnel and training
 - Career fields must view the LNO position as their best asset to advocate for their platform in order to leverage resources
 - Develop a training program in which LNOs have a better understanding of “Influence” & “iC2”



Materiel Solutions



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How do we develop systems and a C2 infrastructure that enables and encourages both formal control and informal influence relationships?

- **Build systems and networks robust to Anti-Access/Area-Denial (A2/AD)**
 - Scalable networks
 - Able to speak on all networks using modules to scale
 - Redundant paths using a Mesh Topology
 - Use local infrastructure
- **Control data flow to minimize issues with having too much information to make a decision**
 - Saves on bandwidth so you can do more with less
 - Shortens the OODA loop
- **Make your systems plug and play with all agencies/organizations/partners**
 - Ease of access approval and connect ability makes working together less of a hassle
 - Demonstrates a willingness to participate
- **Move away from a hub-and-spoke model and look towards point-to-point solutions**



Mesh Topology

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Mesh topology is a communication structure where each node is connected to all other nodes. This provides a redundant path to all other nodes at the cost of increased number of connections.

