

The Role of CFBL in Harmonizing Technological Advancements in Military Coalitions

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As executive agent of the Combined Federated Battle Labs (CFBL), the Joint C4ISR Battle Center (JBC) takes an expanded view of C4ISR beyond national boundaries addressing interoperability in a global context. This expanded consideration, however, is only the first step towards coalition success. JBC also facilitates the use of United States C4ISR assets in a coalition forum and actively coordinates the co-evolution of coalition C4ISR systems. As background, this paper discusses the emergence of JBC from the United States Department of Defense post-Cold War acquisition transition efforts. Also discussed is how JBC's chartered role in serving the United States joint community has prepared the organization for taking the next step—coalition C4ISR experimentation and assessment.

As we enter the new millennium, the strategic environment and operational imperatives of the Cold War have given way to a world gripped by increasing complexity. In the absence of the forces that polarized the world during the Cold War era, the "three worlds" previously shaping strategic thought have given way to emergent decisions by nations gone critical. Society today competes with both the historic as well as futuristic visions of a world order dominated by multinational corporations or multinational crime syndicates. The role of the nation state is debated by academics, leveraged by economists, and challenged by criminals. Traditional societies dominated by ancient beliefs and lifestyles seek to retain either relevance and/or dominance amid this revolutionary turmoil. Squarely in the center of this percolating world stands the professional soldier who will inevitably be at the vortex of their interactions.

While tempting and convenient to define this period as the "Information Age", naming our era after one of many catalysts falls short of defining the full nature of the changes taking place around us. As proposed by Ralph Peters in Fighting for the Future¹, six simultaneous revolutions are driving the global changes confronting each of us. Technology, Information, Social Organization, Biology, Economics, and Convenience all provide fertile fields for radical shifts in thinking, relationships, behavior, and conflict. Peters also offers that analysis of these areas of revolution presents a vehicle to identify potential trouble spots by "...spotting the losers" whose societies will reflect their failure to confront the ongoing changes to their worlds:

- Restricted information flow
- Subjugation of Women
- Inability to accept responsibility for failure
- Extended family or clan as the basic unit of social organization
- Domination by a restrictive religion.
- Low valuation of education

- Low prestige assigned to work

Even if these pulse points are not wholly indicative of societal stability, they are worth noting as a vehicle for self-examination in the context of revolutionary adaptation. One thing seems apparent as the political landscape erodes to form new deltas—only the widely distributed infrastructure will be able to stand on this shifting ground.

Concomitant with and dependent on the already noted revolutions in progress is the much heralded Revolution in Military Affairs (RMA). Among the driving forces in the RMA is the rapid development and fielding of information technology and its nonlinear effect on doctrine, tactics, techniques, procedures, and the full spectrum of military operations. Information age warfare, or Network Centric Warfare (NCW), is characterized by “an information superiority-enabled concept of operations that generates increased combat power by networking sensors, decision makers, and shooters to achieve shared awareness, increased speed of command, higher tempo operations, greater lethality, increased survivability, and a degree of self-synchronization.”² Information Superiority is at the heart of the RMA, with C4ISR dominance providing knowledge-enabled commanders, linked throughout the battlespace, the capability to execute decisions with near-perfect situational awareness. In this network centric environment, command echelons will share a Common Operational Picture (COP), receive instantaneous operational results, and capitalize on information gained from and provided to players such as CNN and MSNBC. Armed with knowledge, combatant commanders will deliver a focused lethality and full-spectrum military dominance that is orders of magnitude greater than previously achievable through attrition warfare. C4ISR Dominance is the “sine qua non” for mission accomplishment. However, the rapid C4ISR technological advancement rendering new capabilities also presents us with new challenges, as articulated by Vice Admiral Jerry O. Tuttle, “the mean time between obsolescence is less than the mean time between failure.” Under the current acquisition process, the mean time between obsolescence is also less than the mean time between acquisition. Based on assumed stability of a bureaucratic adversary and moderate technological advancements, by design, the U.S. approach to acquisition lacks flexibility, adaptability, and speed.

This acquisition process, as currently defined by DOD Directive 5000--while once adequate for building ships, procuring tanks and artillery, and conducting ongoing research and development--is unable to keep pace with the speed of information technology development. Upon post-Cold War scrutiny, the Office of the Secretary of Defense (OSD) identified shortcomings in the DOD Directive 5000 model³, as the acquisition process:

- Treats Advanced Concept Technology Demonstrations (ACTDs), and other innovations, as “non-traditional” excursions;
- Treats evolutionary block approaches as “non-traditional” excursions;
- Endorses tailoring but provides no amplifying guidance to assist strategy development;
- Provides no institutionalized path for demonstration and accelerated development of innovative design and employment concepts.

In short, the United States acquisition strategy is an unwieldy relic of the Cold War.

In this context, the past decade has seen a proliferation of "technological demonstrations" aimed at reaping the benefits of accelerated technological advancements while avoiding the deliberate and extended acquisition process. In Dominant Battlespace Knowledge, Johnson and Libicki relate that "most of the programs that drive the RMA are already funded. They will reach fruition relatively soon, and not all of them should necessarily be accelerated. Their significance is, after all, a function of their interaction." Therefore, "the intellectual basis for arguing for change rests with a sense of opportunity to make high dividend changes."⁴ ACTDs and the annual Joint Warrior Interoperability Demonstration (JWID) are two initiatives whereby warfighters and technologists identify C4ISR high dividend, or "gold nugget", technology candidates ready for near-term fielding. Similarly, the Joint C4ISR Battle Center's chartered mission is rapid experimentation, rigorous assessment, and evidence-based recommendations on accelerated delivery of enhanced capability to the combatant commanders.

Since its activation in 1997, the JBC has aggressively pursued the objectives stated in its charter:

- To provide the combatant commands at the Joint Task Force Level, with a joint assessment and experimentation capability;
- To maintain strong connectivity to programmatic implementations through the Joint Staff J8 and provide a forcing function for joint capability/interoperability;
- To foster rapid near-term insertion and exploitation of C4ISR technology at the combatant command level;
- To recommend interoperability solutions to the Joint Requirements Oversight Council (JROC);
- To act as a learning and experimentation center for the warfighter and the technologist, supporting Joint Vision 2010 (now validated as JV2020) and CINC's requirements for C4ISR capability;
- To support integration of CINC-based C4ISR requirements and solutions into the formal Requirements, Planning, Programming and Budgeting System (PPBS), and joint planning processes.

The charter also tasks JBC with actively engaging in all areas of Joint C4ISR requirements and capabilities, with a focus on near-term exploitation of technology and involvement in the formal requirements process.

The term "requirement" has a precise legal definition under the provisions of DOD Directive 5000, and the services dedicate a significant amount of resources to the requirement definition process. These efforts are ultimately substantiated by published "Mission Need Statements" and "Operational Requirements Documents" subjected to a high degree of intellectual rigor in preparation for JROC review. Prior to the JBC, no joint agency had developed formal joint requirements beyond stated needs contained in periodic reports from theater commanders. JBC has taken the initiative in this area to develop a CINC's "requirement" into a legally supported and intellectually defensible initiative that can bear JROC scrutiny while leveraging already approved service requirement documentation.

The envisioned End State of Joint Vision 2020 clearly maps JBC's area of operations to lie squarely in the "no man's land" defined by the divergent paths of CINC and service requirements. To the theater commander, the path to 2020 is clear and straight with easily defined requirements for which the technological solutions are available today. The services on the other hand, often see the requirements differently and the path they follow to 2020 is not nearly as direct. Within the service budgets, C4ISR solutions must routinely compete with weapons systems, vehicles, ships and aircraft. The difficult PPBS decisions made by the services often create a perceived chasm between service Requirements and the immediate needs of the theater commander. As a result, both the services and the Joint community tend to overlook readily available and mature technology, new enhancements, and associated risks of emerging technology. JBC operates in the Joint-Service gap to challenge the PPBS "requirements" process with the question, "If we can give the warfighter an information superiority edge now, why wait until 2020?"

Over the past three years JBC has provided recommendations for accelerated fielding of enhanced capabilities, or recommendations not to field if the technology failed to measure up to the warfighter utility, maturity, and joint metrics. Lessons learned from the successful identification of high dividend technology during ACTDs, JWIDs, and JBC assessments influenced the rewrite of DOD Directive 5000 acquisition guidance. The new acquisition guidance, currently in draft⁵, will provide an approach well suited to address the emerging acquisition needs of a complex evolving systems of systems. New provisions will include:

- Multiple process paths - not just one way of entering the acquisition process;
- Evolutionary acquisition as the preferred approach;
- Focus on technology development and risk reduction prior to program commitment;
- Timing the funding commitment and program initiation based on maturity of the technology and concept;
- Flexible, time-phased requirements facilitate Cost As an Independent Variable (CAIV) trades;
- Rigorous exit criteria before program commitment;
- Only three potential milestone points: X (Exploration), D (Demonstration), and C (Commitment).

Although this latest version of the DOD 5000 is still in draft form, JBC has 3 years of experience operating under the progressive acquisition guidance being proposed.

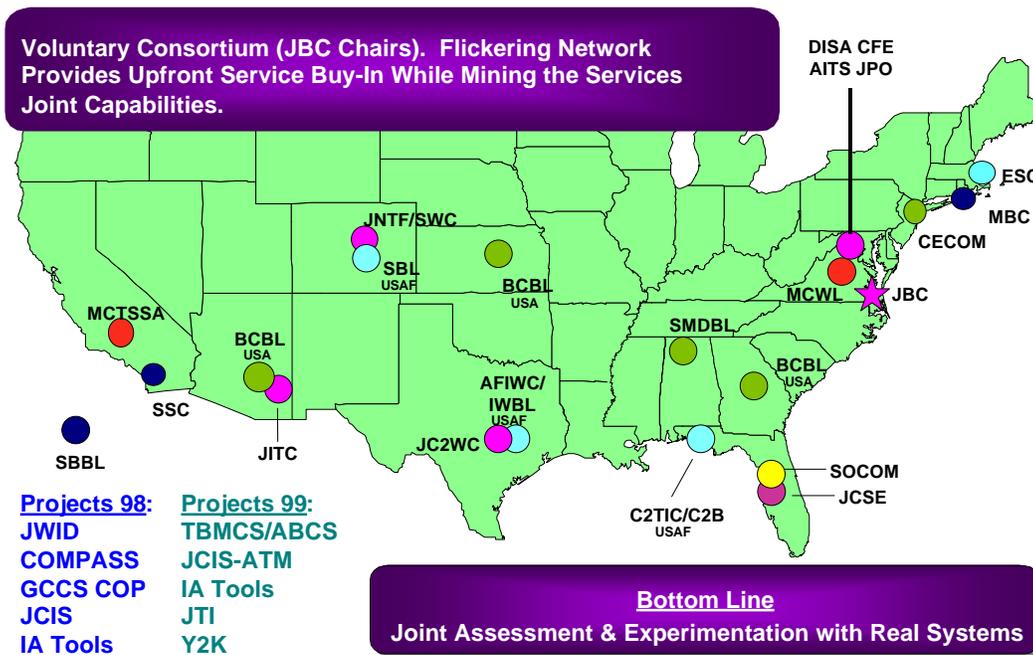
The role of the Joint Battle Center as a challenger of the status quo depends on the establishment and maintenance of partnerships with other agencies and commands who share a similar focus on the co-evolution of joint warfighting capabilities. Collocated in Suffolk, Virginia with the Joint Training, Analysis and Simulation Center (JTASC) and the Joint Warfighting Center, JBC is well positioned to participate and assess technology solutions in tandem with the continuous cycle of JTF training programs. The Hampton Roads area is also home to Joint and Army doctrine developers. JBC maintains close relations with these and all other service doctrine commands to insure that technology and doctrine co-evolve. In *The Unintended Consequences of Information Age*

Technologies: Avoiding the Pitfalls, Seizing the Initiative, Dr. David S. Alberts provides observations on the relationship between policy and doctrine. “When the nature and distribution of information changes, radically new ways of doing business and complications in the old ways of doing business emerge.”⁶ Under such conditions, a change in doctrine “is often essential if the benefits of new information systems are to be realized and inconsistencies between capacity and doctrine avoided.”⁶ U. S. Joint Forces Command Joint Experimentation Directorate conducts exercises to explore the impact of technology not only doctrine, but the full range of DOTMLP (doctrine, organization, training, materiel, leadership, and personnel). As the Joint Experimentation (JE) Directorate charts the path to long-term capabilities, the JBC and JE share physical and intellectual resources to ensure that near-term efforts support movement towards an evolving official future.

While JBC continuously participates in *ad hoc* meetings with information industry leaders and representatives, in June 2000, JBC and the Armed Forces Communications and Electronics Association (AFCEA) conducted the first annual Joint C4ISR Battle Center Industry Day. The Industry Day conference provided the C4ISR industry with the opportunity see what JBC does, what its problems are, and what it needs from the community. The first Industry Day included presentations by the Joint Forces Command Deputy Commander in Chief, the JBC Commander, and other key JBC leadership. The conference attendees also received a tour of the JBC facility and a Federated Battle Lab demonstration.

Over the past three years, JBC has developed partnerships with the scientific community. Service activities such as the U. S. Air Force's Rome Laboratories and the U. S. Army's Communication Electronics Command, independent research activities, and academic institutions are essential to providing C4ISR capability with operational viability and technical supportability. During operational assessments, JBC routinely relies on its partnership with DISA's Joint Interoperability Test Center for in-depth technical and engineering analysis.

Another major partnership exists between JBC and the Service Battle Laboratories in the context of the Federated Battle Laboratory (Figure 1). The FBL is a voluntary consortium that comes together to seize opportunities to test and evaluate technological innovations. During the past two years, the FBL has leveraged technology solutions from other member labs, gaining several significant and high pay-off capabilities. Of particular note is the partnership between Fort Gordon's Signal Center, SPAWAR Systems Center, and the JBC in the area of mobile communications through the use of Wireless Asynchronous Transfer Mode (ATM) communications.



Federated Battle Lab Sites
Figure 1

As depicted in Figure 2, Memoranda of Agreement (MOAs) with services and agencies insure JBC's computer laboratories receive the latest versions of Joint and Service command and control hardware and software.

Subject

- Joint Battle Center
- JTASC ISSA
- Exercise Integration
- Joint Interface Control Officer (JICO)
- Joint Simulation Systems (JSIMS)
- Global Broadcast Service (GBS)
- Intelligence Analysis System (IAS)

- All Source Analysis System (ASAS)
- Information Dissemination Management (IDM)
- SIPRNET Connectivity
- GBS Asymmetric Networking
- GCCS-M

Partner

- USJFCOM/Joint Staff
- USJFCOM/J7 (JTASC)
- USJFCOM/J7

- USMC Systems Command, Info Systems PM
- USMC Tactical Systems Support Activity
- Program Manager, Intelligence Fusion
- IDM Product Team, DISA
- USJFCOM
- Naval Research Lab
- SPAWAR Systems Command

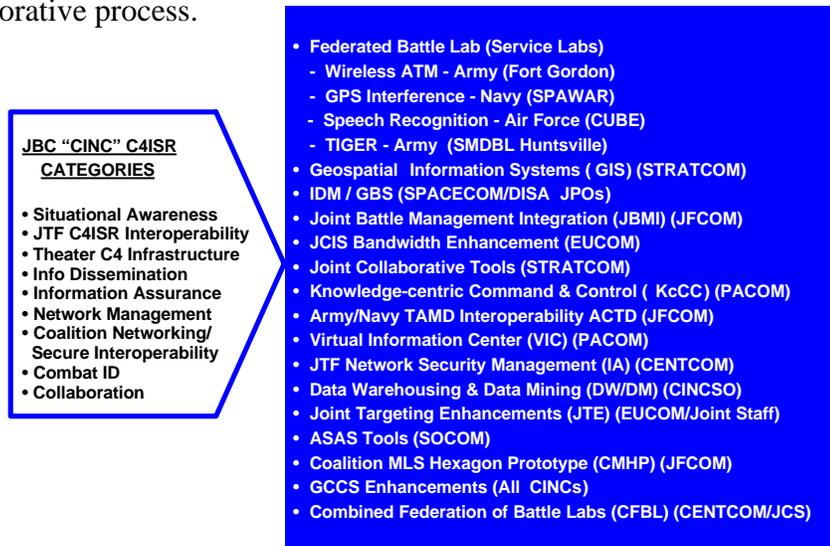
Partnership MOAs
Figure 2

Within the context of open relationships with the services and agencies, JBC's mission remains centered on the fulfillment of combatant commander requirements. As

an important collateral benefit, knowledge gained through JBC's assessment process also facilitates a coordinated approach to finding solutions to both CINC and service requirements. The standard JBC Assessment is a three-phased series of analyses over a period of 18 to 24 months. Phase 1 normally involves both a "desk top" and an initial laboratory evaluation of available technology to determine the feasibility of a comparative assessment. Phase 2 centers on employing technology in a laboratory and field environment to assess its mission applicability and capabilities. Phase 3 puts technology in the hands of the operational commander, with the final assessment report reflecting both the technologist's and the warfighter's evaluation. The assessment report forwarded to the JROC for decision constitutes the JBC's chartered challenge to the C4ISR acquisition policy and process. The end of the process, the ultimate JBC product, is a JROC decision to deliver a JV2020 capability to the warfighter sooner than achievable through the traditional acquisition process.

Although JBC's charter⁷ is to challenge the process to provide information superiority to the theater commander and Joint Task Forces he deploys, the process must be more than a "science fair". If the fight is not faster or more lethal to our enemies, JBC has spent time and resources for naught. Accordingly, every potential project must meet three basic criteria before the assessment process even begins. As "Go - No Go" criteria, the candidate technology must have warfighting utility with respect to its function and information it provides. Secondly, it must be "Joint" in nature, supporting information exchange and meeting security and accreditation requirements to eliminate traditional service or functional "stove pipe" configurations. Finally, operational, technological, and programmatic maturity is essential to the accelerated acquisition and successful fielding of any technology.

To maintain an operational emphasis rooted in reality, every January the JBC solicits theater combatant commanders for their lists of C4ISR theater priorities. Based on these submissions, JBC conducts detailed reviews of pertinent technologies, refines them into project proposals, and presents them to the various headquarters for review and concurrence. Figure 3 depicts the Fiscal Year 00 Projects that resulted from this collaborative process.



Fiscal Year 00 Projects
Figure 3

Emergence of the Combined Federated Battle Labs (CFBL)

“I believe there is one common element to all correct decisions. They include considerations of the bigger picture.”⁸

-Peter Schwartz

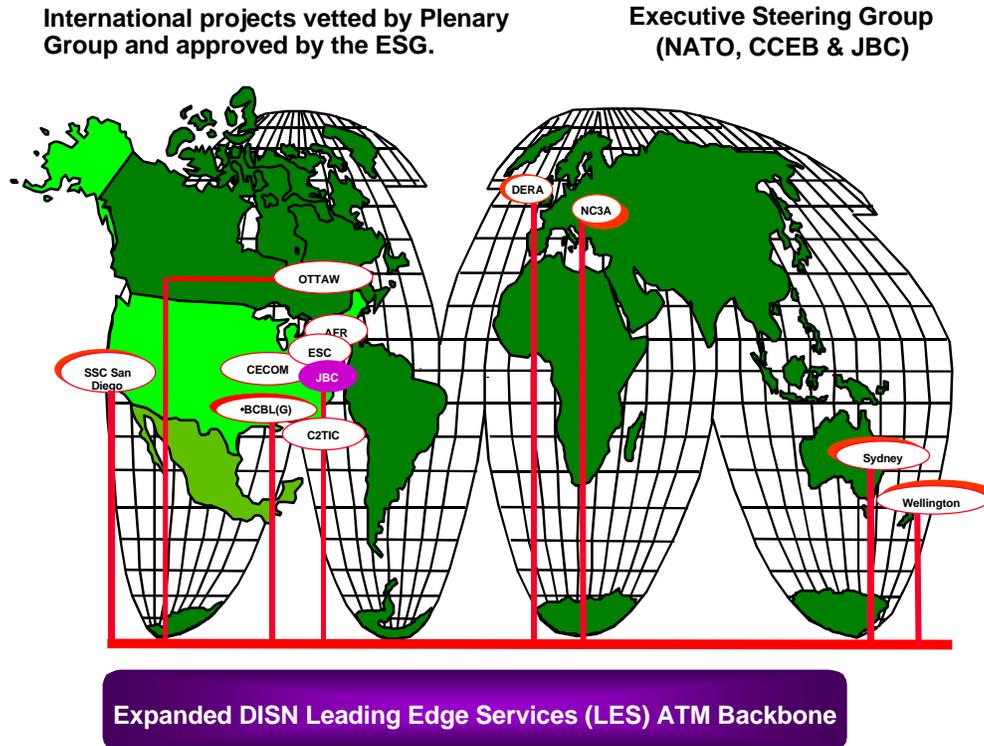
A recent report from the U. S. Army Digitization Office, recognizing the Congressional and Department of Defense guidance to enhance United States capabilities in combined operations, concluded the following:

- A coalition operational architecture does not exist.
- A process is required to determine priorities and resources for research and development.
- A process is required to insure that the products of various military and technology forums are integrated into systems and architectures.
- Experiments/exercises are required to prove out the capabilities being developed in multinational forums.

The authors of *Network Centric Warfare* articulate the “need for improved approaches to the challenges associated with integrating a federation of systems.”⁹ With insight that is applicable in a military context, Peter Schwartz, President of Global Business Network, proposes that “the world needs a framework of new international institutions--a new global commons-- to coordinate people worldwide.”¹⁰ Addressing the need for worldwide coordination of C4ISR experimentation and development, the Joint Staff tasked the JBC, in April 1999, to support their efforts to establish a Combined Federation of Battle Laboratories. This organization exists today as the Combined Federated Battle Labs (CFBL). The overarching framework for this "confederation" provides a venue for combined tests and experiments multinational in nature, supports the United States' Joint Vision 2020, and remains responsive to the combatant commanders. Resultant of CFBL establishment is the ability to leverage the existing Federated Battle Laboratory system with JBC as the junction of the two networks. Capitalizing on an open partnership of equal members, the objectives of the CFBL emphasize mutual benefits to its members as follows:

- Provide an environment to investigate interoperability solutions to identified deficiencies.
- Provide linkage between U. S. Federated Battle Labs and Allied Battle Labs.
- Share results of operational assessments of emerging interoperability solutions.
- Provide templates for operational networks within the various theaters.
- Provide a venue to assess tactics, techniques, and procedures (TTP) that leverage technological innovations.

Initial CFBL membership includes NATO as represented by the NATO Consultation, Command and Control Agency (NC3A), the Combined Communications Electronics Board (CCEB), and the United States. As depicted in Figure 4, the CFBL

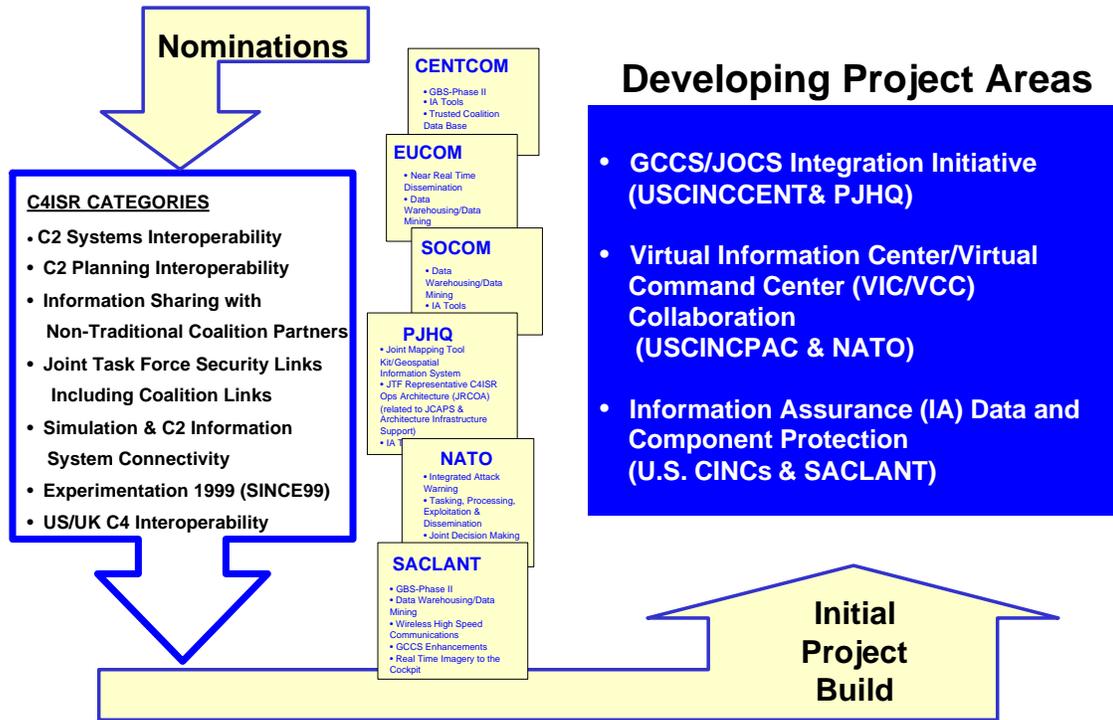


Combined Federated Battle Lab Sites
Figure 4

Net incorporates the CWAN backbone of Joint Warrior Interoperability Demonstration (JWID) 99 and provides a venue for year round experimentation by the combined research labs of CFBL members. Building on the relationships and confidence established during previous JWIDs, the strategy is to incorporate the proven methods of both the Federated Battle Laboratories, NATO Best Practices, and the experiences of the CFBL members. The CFBL provides members a venue for asking "what if" in a coalition sense, and provides the means to find the answers based on evidence gained through experimentation—answers contributing to the development of combined C4ISR tactics, techniques and procedures.

Ongoing discussions regarding the CFBL have outlined Combined C4ISR priorities that are strikingly (but not surprisingly) similar to the categories developed by U. S. Combatant Commanders (Figure 3). As CFBL continues to mature, a project development process (Figure 5) incorporating the operational perspectives of the diverse theater and operational commands has started to evolve. The CFBL Permanent Working Group, comprised of representatives from various CFBL member nations and alliances, provides a balanced representative body to review and recommend projects to meet

coalition priorities.



Project Development Process
Figure 5

CFBL plants the seeds of ingenuity, stimulated by informal experimentation and conversation, in the fertile ground of formal processes to produce tangible results. Additionally, the CFBL provides a forum for the evaluation of the effects of the interaction of technology with policy, doctrine and procedures. Perhaps most immediate in its benefit is the maintenance of a "living" operational architecture and template for combined wide area networks, and interoperability lessons learned.

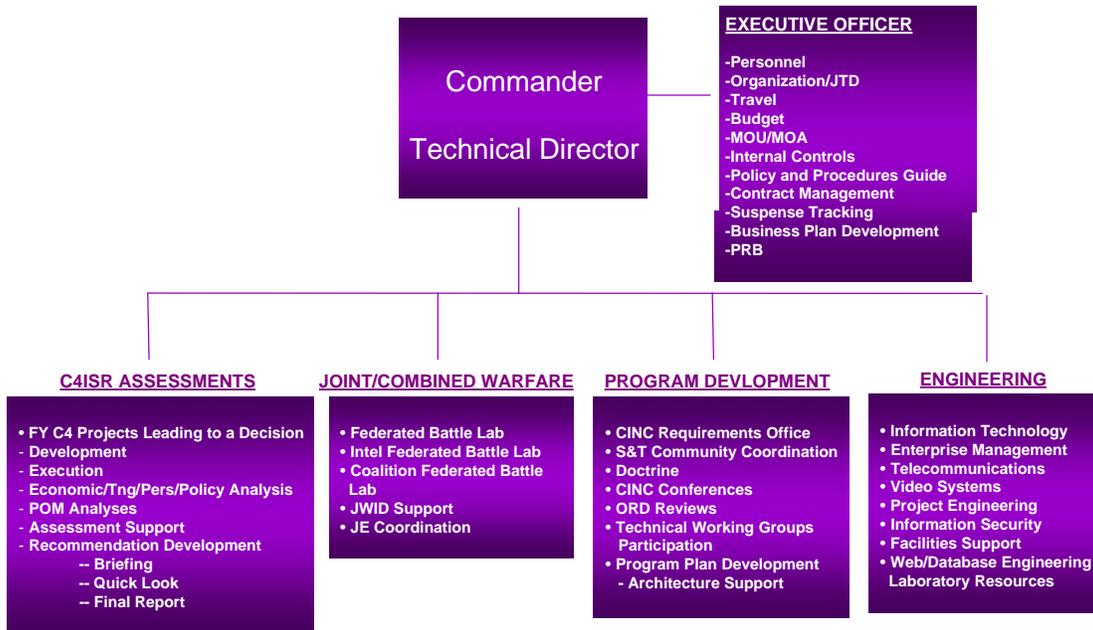
"If you build it, they will come!"

From the outset, JBC's role as the C4ISR advocate for the "Warfighting CINCs" has relied on the development of partnerships with services, agencies and allied laboratories. Over the past three years, these functional alliances, such as the Federated Battle Laboratory and the Combined Federated Battle Laboratory, have exceeded even the most optimistic expectations in the areas of maturity, synergy, the operational and technical returns exceeding the time and resources committed. These successes have led to a reevaluation of the JBC organization and the subsequent realignment of resources. Figure 6 depicts the new organizational model which seeks:

- To accentuate program development and CINC support;
- To streamline the assessment and reporting process;
- To coordinate battle laboratory activities;

- To interface with Joint/Combined experimentation;
- To respond to national and international C4ISR requirements.

JBC Command Organization



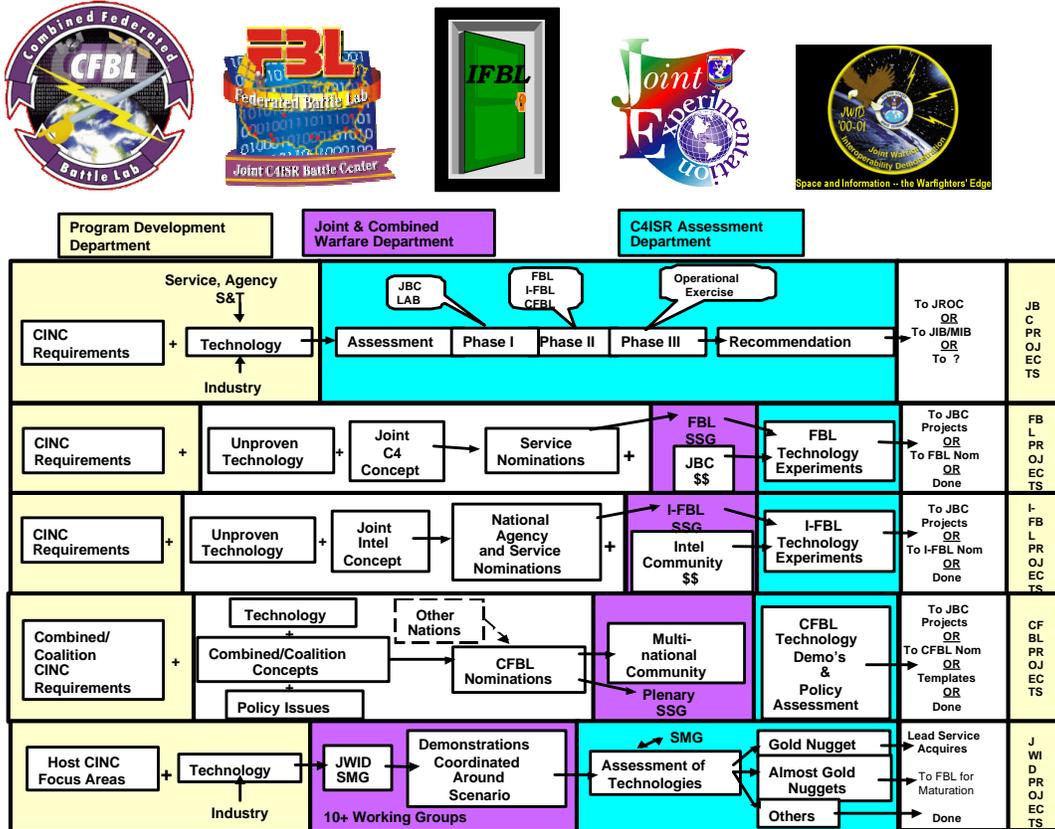
JBC Command Organization
Figure 6

At the heart of this innovation for the Twenty-first Century, is the Combined and Joint Operations Directorate. Integrating the proven successes of the FBL and the CFBL, with increased support to Joint Warrior Interoperability Demonstrations (JWID), the Combined and Joint Operations Department will execute the JBC’s mandate to provide frameworks and venues for experimentation and the assessment of Joint and Combined C4ISR initiatives. Incorporating increased linkages to “Joint experimentation” and an Intelligence Federated Battle Laboratory, this new directorate is tasked with a challenging and exciting set of objectives:

- Provide a national and international environment to identify interoperability solutions to known C4ISR deficiencies.
- Provide linkage between national and international C4ISR activities.
- Facilitate operational C4ISR experiments and assessments.
- Provide templates for operational C4ISR integration.
- Provide venues to assess processes that affect technological innovation.

This new organization provides the intersection of battle laboratories, JWID, and Joint Experimentation, with the already proven CINC Nomination Process. The increased

options for project execution (highlighted in Figure 7) form the basis for a continuing cycle of requirements definition, technology identification, experimentation and assessment, and interoperability solutions for the joint and combined warfighter.



How the Processes Come Together
Figure 7

The Way Ahead...Building Technical Solutions and Strategic Relationships

In the brief three years since its inception, JBC has actively sought to implement the provisions of its charter and expanded its initiatives in the pursuit of C4ISR solutions for the Joint and Combined Warfighter. The payoffs of the initial Joint Staff investment are reflected in the interoperability solutions that have already been forwarded for JROC decisions and incorporated in fielded capabilities. The initial Federated Battle Laboratory construct that provided a continuous, economical, and national C4ISR experimentation environment, has become a model for intelligence and coalition experimentation within and beyond the Joint Warrior Interoperability Demonstration process. The Project Development and Assessment process continues to provide theater commanders a streamlined conduit to facilitate programmatic and operational solutions to C4ISR interoperability issues while integrating technological and doctrinal development.

As C4ISR technologies are adopted and implemented across U. S. services and alliances, JBC will continue to innovate and evolve efficient experimentation and assessment models. Challenging the standing acquisition processes with innovation and integrity reflects ultimately our institutional loyalty to the soldiers, Marines, sailors and airmen as well as our coalition allies whose success and survival across the full spectrum of military operations will be our final report card.

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 3. Deputy Under Secretary of Defense (Acquisition Reform) [ODUSD\(AR\)](#) and the Office of the Under Secretary of Defense (Acquisition, Technology, and Logistics) Systems Acquisition [OUSD\(AT&L\) SA](#), <http://www.deskbook.osd.mil/>.
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