TOP-LEVEL DC2BM SUGGESTED ACTIONS

Our top-level suggested actions to enhance DC2BM fall into four areas:

- Refinement and formalization of a CONOPS and TTP for DC2BM of ISR assets and weapons systems.
- Creation of a consistent, common view of the battlespace.
- Automation of the DC2BM process.
- Development of a robust, collaborative, distributed environment.

An updated and refined joint CONOPS and TTP for DC2BM of ISR assets and weapon systems for the prosecution of TCTs should be formalized.\(^1\) Those CONOPS and TTP should address who, where, and how the DC2BM functions should be performed to support attacks.

\(^1\)Air Combat Command has promulgated a top-level CONOPS for C2 against TCTs for the Combat Air Forces (ACC, 1997). The Air Force Command and Control Training and Innovation Group also developed baseline CONOPS and TTP for TCTs to support JEFX 2000 (AC2ISRC/AFC2TIG, 2000a, 2000b). U.S. Joint Forces Command’s explorations of approaches against TCTs in its Attack Operations Against Critical Mobile Targets (AOACMT) efforts, conducted in 1999–2000, contain various lessons that may also be applicable. Other service activities (e.g., Fleet Battle Experiment results) hold sources of documented insights that may be helpful. These documents provide a good starting point.
against cruise missiles, theater ballistic missile launchers, fielded forces, and SAMs—all using hide, survival, and shoot-and-scoot tactics. Because counter-TCT operations may be conducted in a wide range of crises (small- and large-scale operations) and because command authority prerogatives on how and where to exercise DC2BM of ISR and weapon systems to achieve desired effects may be vested at varying levels (from JFACC to National Command Authorities), the challenge lies in crafting a scalable and flexible TCT functionality. For example, the TCT functionality could be performed on board the Iron Triad; in a TCT cell embedded in the AOC; or at distributed locations.

An overarching DC2BM need in the mission areas of TMD, SEAD, and interdiction of small-unit ground forces is the refinement and mechanization of the processes, TTP, and systems for developing a consistent, common view of the battlespace that underpin the creation of common operational and tactical pictures. Without proper mechanization (including substantial automated support) to create an IPB-based geographic product underlay and subsequently to insert, with date and time stamps, the locations and dispositions of friendly, enemy, and neutral forces and targets (based on correlated multi-INT and surveillance data), decisionmakers will continue to be hampered in their performance of key functions (e.g., the timely de-confliction of TCT and preplanned missions and airspace that is implicit in rapid targeting, target nomination, and weapon and target pairing). Most elements\(^2\) to achieve this DC2BM capability are available or are being developed, but they must be integrated and adequately funded.

Timelines for performing DC2BM functions—from target detection to weapons on target—must approach 10 minutes or less to achieve even modest effectiveness against many types of TCTs. To shorten current timelines, extensive automation (tools and applications) is required in each of the six functional areas. New DC2BM capabilities should be pursued in close coordination with TBMCS improvements.

\(^2\)For example, Integrated Collection Management advanced concept technology demonstration, Automated Assistance with Intelligence Preparation of the Battlespace, Air Defense System Integrator, Dynamic Moving Target Indicator Experiment, TBMCS Situational Awareness and Assessment, and Global Command and Control System common operational picture.
One area for consideration within the TBMCS construct is the use of an open architecture structure leveraging and based on a Web-enabled\(^3\) browsing and information access approach. Making use of disparate tools and applications of legacy, current, and future iterations may require a software translator or some sort of software wrapper.\(^4\) Such considerations will be necessary if continued integration and automation of TBMCS core processes are pursued.

Finally, a robust, collaborative, distributed environment—tools for collaboration; on-demand, sufficient, and assured communications; a flexible network and server architecture with responsive operating protocols; an effective network manager; and an empowered information manager—is essential to the DC2BM process. An improved InfoWorkSpace-like tool with expanded simultaneous multinetwork participation capabilities and a stable network and server architecture needs to be developed. Formal network and information manager positions should be created for the AOC, and personnel must be trained to perform the functions of those positions. Finally, tests of the DC2BM process and tools in collaborative environments should be continued to determine both the extent to which decisionmakers will be able to rely on a collaborative, distributed environment in future operations and the level of personnel expertise and training that will be required to operate in such an environment.

**TOP-LEVEL CONSIDERATIONS**

In developing a flexible TCT functionality and selecting specific tools to support the timely performance of the six top-level DC2BM functional areas, four important factors should be considered:

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\(^3\)The term *Web-enabled* refers to the use of markup languages (e.g., HTML, XML) to present information using links between various documents, images, and servers within a given information enterprise accessed by a browser (e.g., Microsoft Internet Explorer, Netscape Navigator).

\(^4\)A *software wrapper* refers to the technique of integrating two applications written in differing source code languages through the use of a software program that provides the translation services between the two as well as permitting a common user access environment to both applications.
• Tension between planned and dynamically tasked missions.
• Jointness and defense in depth.
• Balanced and synchronized investments among DC2BM, ISR, aircraft, and weapons.
• Robustness and flexibility.

First and most important, new DC2BM improvements should be designed so that they do not jeopardize Air Force capabilities to execute deliberately planned strike and air superiority missions. Steady-state deliberate air operations (those planned and then executed as planned in the ATO) will continue to be important in the application of air power (e.g., strike missions against fixed components of adversary centers of gravity). Well-established Air Force dynamic air-to-air capabilities with ATO preallocated assets (e.g., offensive counterair sweep operations and defensive counterair combat air patrol) will also continue to be important. These operations are designed to achieve the operational objectives of the overall air campaign plan. However, improper design of new DC2BM capabilities (lack of adequate automation, poor deconfliction aids, excessive fragmentation of responsibilities, and inadequate dynamic resource reallocation decision aids) may cause AOC leadership to devote too much attention to TSTs, to the detriment of more-deliberate strike and preassigned air superiority missions. Moreover, in the target-rich and weapon-constrained environment typical of a limited-warning major theater war, the unwise reallocation of weapons systems from preplanned targets (missions that nominally have a high likelihood of success) to TCTs (mission with a much lower likelihood of success) may disrupt the intended battle rhythm and the timely accomplishment of intended effects. This suggests that new DC2BM programs must interact seamlessly with key elements of TBMCS that are integral to deliberate operations—intelligence and operational databases, master air attack planning, and targeting tools.

Joint DC2BM solutions will be required in all of the mission areas we considered, but this is particularly clear in interdiction of small-unit ground forces and theater air and missile defense. Interdiction of small-unit ground forces clearly requires a joint response (as our experience in Operation Allied Force showed). In particular, ground
forces and/or sensors must be involved to help detect, identify, and engage the targets under restrictive rules of engagement.

Theater air and missile threats also require a joint response, but for different reasons. Because it is clear that a single defense element cannot achieve the necessary robustness or performance level (i.e., 90 percent or greater probability of success), a joint defense-in-depth architecture, with more modest performance (e.g., 50 percent) in each layer, is usually envisioned for addressing cruise missiles and TBMNs. The capabilities discussed above must consider such multi-layer defense constructs. For example, Air Force TCT CONOPS must address defense in depth; collaboration tools should be developed with such constructs in mind; and communications capabilities should be interoperable to ensure information can be passed among the multiple layers.

The third consideration underscores the point that investments in DC2BM must be synchronized with those in ISR, aircraft, and weapons, as well as being adequately funded (often not the case), to ensure that desired TCT capabilities are met. By this we mean if particular improvements in ISR, aircraft, and weapons are made to address TCTs, the necessary DC2BM programs must be included. For example, if a survivable, deep-look, long-dwell, focused-look surveillance capability consisting of several sensors is developed, the accompanying (and interoperable) DC2BM processes, systems, and personnel must also be developed. Alternatively, if a single sensor system is to be the focus of such a capability (for instance, space-based radar), the needed DC2BM must be included as part of the system. The challenge here is to ensure that major ISR, aircraft, and weapon program funding requirements are presented to decision-makers in their totality. DC2BM requirements should be included in the C4ISR plan required by DoD for the acquisition of major systems; the plan can then be used to justify funding of needed C2BM programs.

Last, although the United States currently does not face any major military threat to its national security against which it cannot ultimately prevail, uncertainties about future threats underscore the need for a hedging strategy. The U.S. desire to maintain superior capabilities to perform military missions makes such a strategy even more important. These conditions suggest that DC2BM programs
and initiatives to fix current shortfalls must be sufficiently flexible to support more-advanced ISR, aircraft, and weapon systems. For example, efforts to improve rapid targeting of Global Positioning System (GPS)–aided weapons should be extendible to support GPS-aided standoff weapons with target acquisition sensors (such as Joint Air-to-Surface Standoff Missile and possibly advanced long-range missiles with inflight retargeting capabilities). Similarly, the design of rapid targeting and target nomination, target and weapon pairing, and order development and issuance for nonstealthy aircraft should not impede integration of comparable processes for low-observable aircraft and potential unmanned combat air vehicles. These considerations suggest that DC2BM programs should be carefully reviewed to see how well they support new ISR, aircraft, and weapon system programs.