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The 21st Century JAOC: Virtual, Modular, Responsive

by

Maj Johnathan B. Hughes, USAF

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Maritime Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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15. Abstract:

The concept of the Joint Air Operations Center (JAOC) began in World War II, when Allied forces realized the inherent weakness of parceling airpower assets in direct support of ground commanders. Since then, the JAOC has been evolving in response to practical concerns in other conflicts as well as joint doctrine. The current system, therefore, is less a product of efficient design than it is a reflection of the way the services have always done business. This report examines the JAOC concept in light of current joint doctrine as well as current and near-future technologies in an effort to re-tool the organization along more efficient, modular lines. By capitalizing on reachback to CONUS or HQ for many functions, the organization can be drastically streamlined. Additionally, by making use of emerging web-based technologies, the air tasking cycle can be reduced and made much more dynamic and responsive. Finally, since nothing can be implemented in a vacuum, limiting factors—service rivalries, training requirements, and JFC buy-in—are discussed.

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Introduction

The Joint Air Operations Center (JAOC), which began in World War II, has evolved to meet new challenges—from Vietnam to Iraq to Kosovo—by adding layers to the original structure or by speeding up original procedures; it is time to re-think the concept in terms of both current joint doctrine and current (or near-future) technology. The JAOC must be designed from the ground up to prosecute likely future conflict, rather than to placate historic nostalgia or service insecurities. The Joint Force Air Component Commander (JFACC) exercises operational control (OPCON) over assigned and attached forces, and tactical control (TACON) over other forces made available for tasking[1], and is charged with "planning, coordinating, allocating, and tasking joint air operations based on the JFC's concept of operations and apportionment decision."[2] The JAOC must be structured, staffed, and organized to allow the JFACC' to fulfill his responsibilities.[3]

As early as the North Africa campaign in World War II, it became apparent that airpower must be centrally directed rather than parceled out to commanders in the field; Roosevelt and Churchill recognized that, and centralized control of airpower under an airman during the 1943 Casablanca Conference.[4] Thus the AOC was born, and the JFACC (though not given that title until 1986) to command it.

During Vietnam, the AOC was reborn as the Tactical Air Control Center (TACC), though the dual nature of the air war in that conflict—tactical air, which needed a great deal of flexibility, supporting ground troops in South Vietnam, and strategic air, which required careful planning, performing interdiction in North Vietnam—became reflected in the "combat plans" and "current operations" sections of the TACC.[5] Thus the idea of two staffs, one to orchestrate "today's war," and one to plan "tomorrow's war," which is enshrined in joint doctrine even today. Joint Pub 3-56.1, *Command and Control for Joint Air Operations*, specifies that "the two organizations or functions which should be common to all JAOCs are **Combat Plans** (future joint air operations) and **Combat Operations** (execution of the daily joint ATO)."[6]

Operation DESERT STORM, in 1991, became the first true test of the JFACC concept, and it very nearly did not survive the service rivalries, with "senior Navy commanders vigorously opposed to working in a joint operation, especially with an Air Force general in charge."[7] Even more defiant, Marine Corps headquarters referred to the "Joint Force Air *Coordinator*," and refused to recognize the JFACC's authority.[8] The Goldwater-Nichols Act, meant to force the services to work together, seemed merely to have inflamed the old rivalries.

Finally, Operation ALLIED FORCE, the air operation in Kosovo, highlighted not only the challenges of prosecuting a war with severe political constraints, but of working in a coalition environment, as well.[9] Not only did NATO allies lag behind the United States in ability to control large-scale air

operations,[10] but U.S. forces maintained a separate chain of command, outside that established by NATO for just such an occasion.[11] The historical inertia illustrated by the above examples must be overcome as we re-think the concept of the JAOC.

What, then, are the specific shortcomings of the current incarnation of the JAOC? The shortcomings—inefficiencies more than failings, really—fall into four broad categories: the organization's unwieldy size, the long planning cycle (48-72 hours for the Air Tasking Order), service and component stovepipes, and doctrinal immaturity. The first shortcoming is the inevitable result of the bureaucratic evolution of the JAOC since World War II, but is nevertheless significant: "fully deploying a JAOC for a large campaign like Desert Storm requires 41 loads on C-141 aircraft to carry the equipment, in addition to 3 widebody airliners required to deploy the 900 people needed to operate the JAOC."[12] The second shortcoming, Joris Janssen Lok, of *Jane's International Defense Review*, points out, is that, not only is the current planning cycle too long given today's dynamic battlefield conditions, but there is only "limited integration of force execution."[13] Third, the service stovepipes must be reduced, because "the key to success in future joint operations will be the ability to synergistically prosecute the war throughout the depth of the theater. This ability begins by assuring unity of command at all command echelons, providing explicit clean lines of command and communication, and by focused, coordinated objectives."[14] Finally, the joint community must come to grips with both the

theory and practice of employing airpower. A fundamental reality of airpower is its ability to mass anywhere in a theater, and that ability is degraded or lost if control is divided or decentralized,[15] as Roosevelt and Churchill realized more than 50 years ago. As J. L. Whitlow puts it, "It is time to take off the doctrinal blinders and look harder for the solutions."[16]

Re-thinking the JAOC must begin, of course, with an examination of current joint doctrine with regard to JFACC duties and JAOC organization. Examining the JFACC is necessary to ensure the JAOC fulfills its primary function of supporting him, and a look at the JAOC is necessary to find the baseline from which we will deviate. After looking at current doctrine, it becomes possible to explore ways to meet the current challenges or mitigate the shortcomings if a solution is not possible. Next, a new JAOC that incorporates the new structure and procedures may be constructed. Since it is unrealistic to expect perfect success, Limiting Factors (LIMFACs) that may hinder implementation of the new JAOC must also be considered. Finally, a way forward, toward implementation of the findings, will be presented.

Current Joint Doctrine

Joint Pub 3-56.1, *Command and Control for Joint Air Operations*, provides the doctrinal guidance for the JFACC and JAOC. As we saw earlier, the two—JFACC and JAOC—must be looked at together, since the JAOC is the organization tasked with implementing the JFACC's plan and is the instrument by which he fulfills his responsibilities. Also important to note is the JFACC's

component commander status, which, absent a specific situation and JFC guidance, is equal to that of the other component commanders. As Houle puts it, "From the broad doctrinal perspective, air power is not by definition subservient to the other two mediums. All three (air, land, and maritime) combine in joint operations to support the overall theater commander's objectives."[17]

JFACC Duties

The figure below encapsulates the JFACC's responsibilities in joint doctrine:

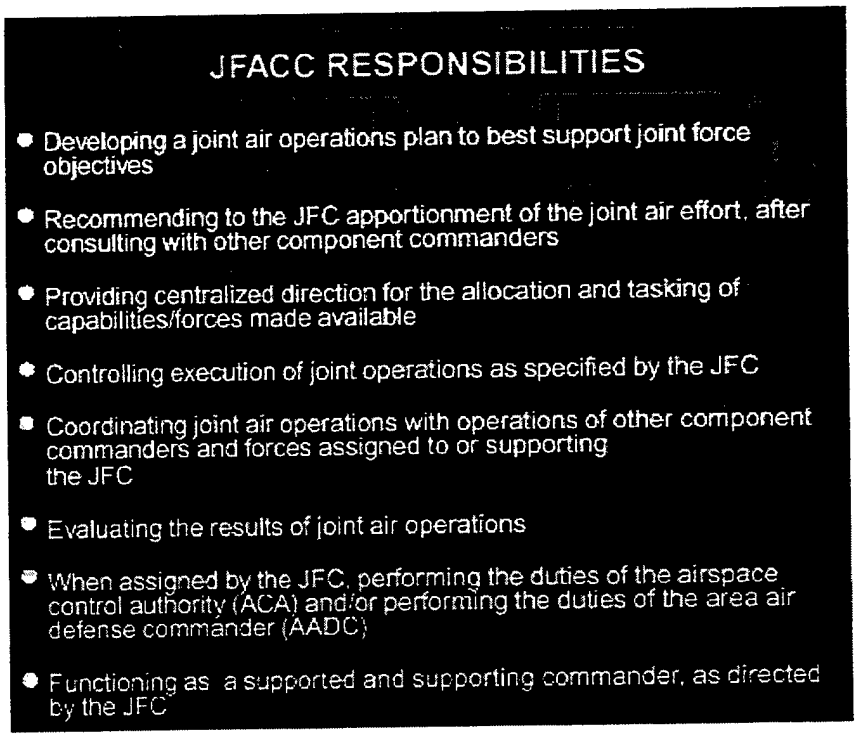


Figure II-1. JFACC Responsibilities

Figure 1.[18] JFACC Responsibilities

Because airpower, and hence the JFACC, has theater-wide perspective, the JFACC is normally designated the airspace control authority and the area

air defense commander. In practice, the JFACC's role is to apply airpower throughout the theater in support of the JFC's objectives:

> Once a theater CINC or JFC develops a concept of operations and designates a JFACC, the air component staff translates it into a cohesive joint air operations plan. In coordination with planners from other assigned functional components (land, sea, space, and special operations), air component planners design a comprehensive master attack plan to meet the overall objectives of the campaign plan. Air operations (which might include deep-strike helicopter missions, Tomahawk cruise missiles, and Army tactical missile strikes beyond the fire support coordination line) are then phased and sequenced in an overall campaign plan to affect enemy operational and strategic centers of gravity. As with all operational-level planning and execution mechanisms, a JFACC provides the linkage between strategic objectives and the tactical application of combat power.[19]

JAOC Organization

A typical JAOC is organized as shown in Figure 2, below. Like most military organizations, it is hierarchical. There is also a distinct split between the combat plans and the combat operations organizations—even their intelligence functions are separated. Functionally, the JAOC resembles an assembly line: each shop adds its piece to the ATO, then passes it to the next, only to begin work on a future ATO, in turn. In practice, of course, there is more coordination than would be found on an assembly line, but that happens in spite of, rather than because of the organization's structure. In addition, because of its size, there are many support functions, from personnel to logistics to staff judge advocate. Also of note in the JAOC organization are the liaisons from the other components. Coordination and command happen through different stovepipes, and at different levels. Though enshrined in doctrine and history,

these characteristics deserve close scrutiny when we begin re-thinking the JAOC.

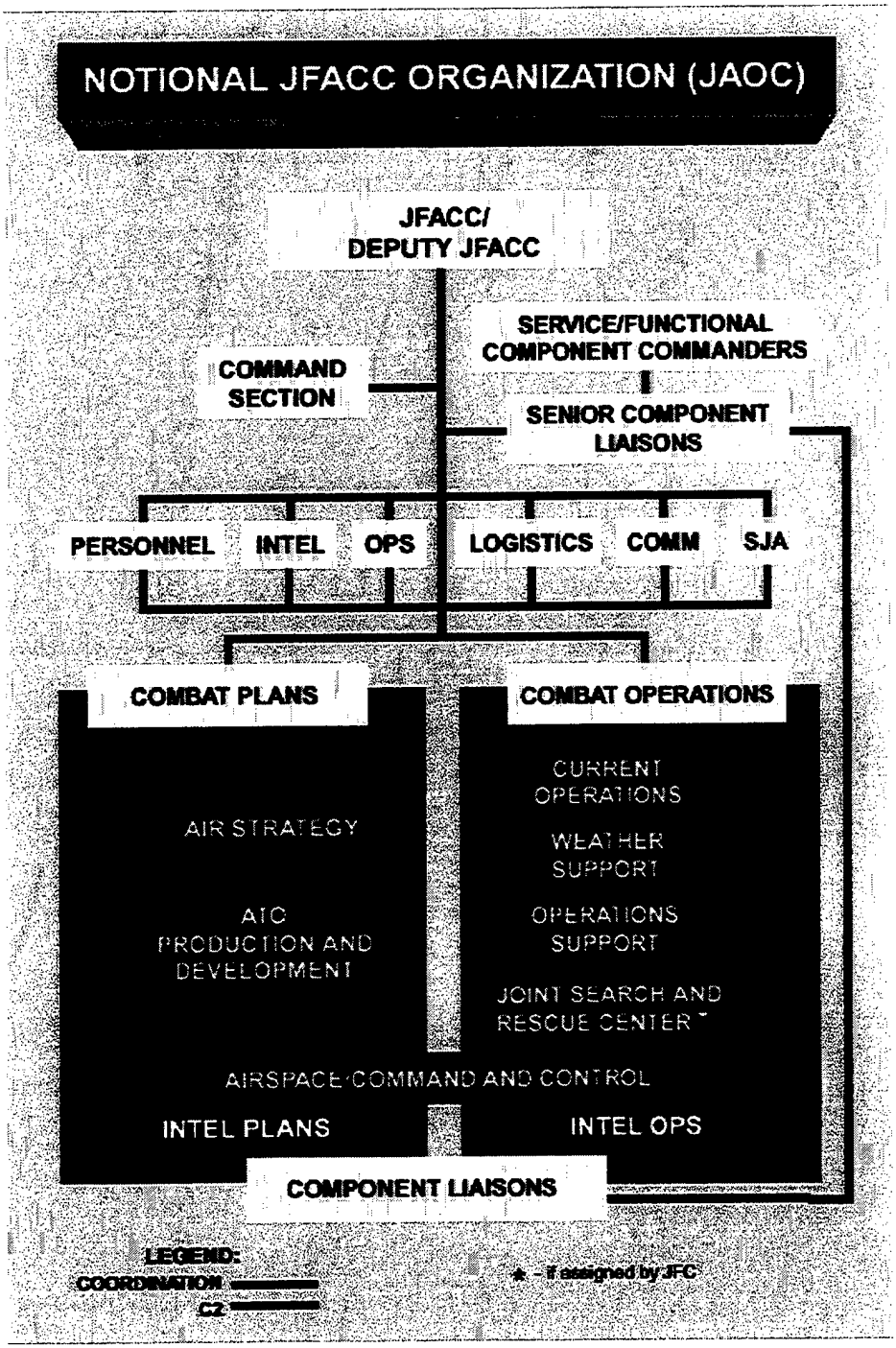
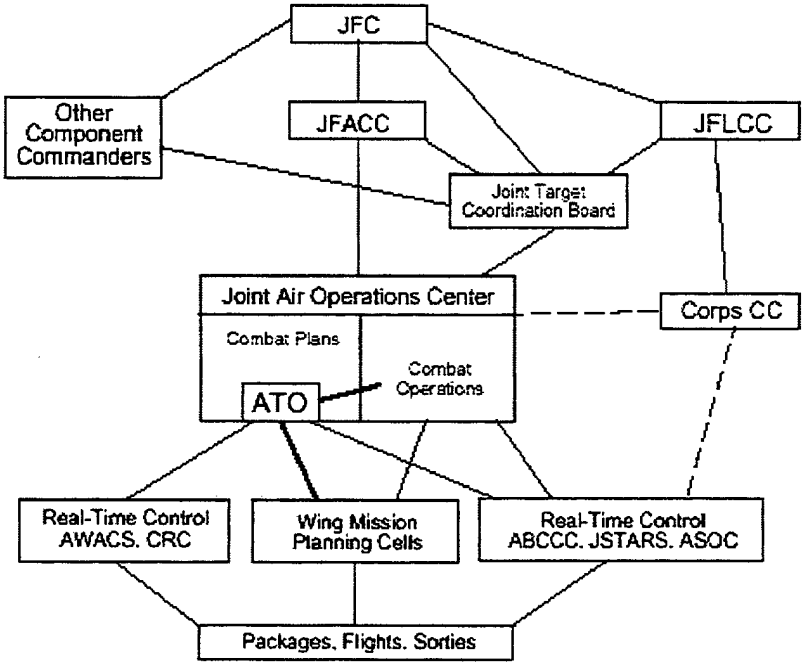


Figure II-4. Notional JFACC Organization

Figure 2.[20] JAOC Organization

Joint Targeting Coordination Board

The Joint Targeting Coordination Board (JTCB) can have various roles, from JFC-level target review, to detailed oversight of the targeting process.[21] Figure 3 shows notional relationships between the JTCB and other organizations with respect to targeting:



Source: Adapted from Lt Col Michael Straight. "Commander's Intent: An Aerospace Tool for Command and Control?" *Airpower Journal* 10, no. 1 (Spring 1996): 43.

Figure 3. Typical Theater Air Control System Showing Combat Tasking Authority

Figure 3.[22] Combat Tasking Authority

This shows the JTCB as a component-level target nomination and review tool, with the JFC in charge. This arrangement is probably the least controversial amongst the services, as the JFC is present to resolve any targeting disputes. On the other hand, it also has the potential to drag the JFC into playing

moderator for component commanders vying for control of the targeting process, rather than staying focused on higher-level concerns of phasing and synchronization. Regardless, this is another opportunity to examine joint doctrine (which seems to have left the issue open, anyway) for a better way to conduct operations.

The true test of a JTCB will come, of course, in conflicts unlike those in recent memory. During DESERT STORM, there was no shortage of airpower.[23] Similarly, dynamic targeting was an issue in ALLIED FORCE[24], where there was again no shortage of airpower. According to General William Momyer, who commanded 7th Air Force during the Vietnam war, the challenge is "determining the proper balance among competing demands, strategic attack, interdiction, and close air support."[25] The organization should, however, be structured to make those hard allocation decisions—cooperatively among components, if possible.

Air Tasking Cycle

Figure 4 depicts a notional targeting cycle. Although it seems properly recursive and cyclical at first glance, we must remember to place it in the context of the notional JAOC structure. When the air tasking cycle is overlaid upon the JAOC, it becomes apparent that, though the *process* seems to be an integrated whole, it is forced into an assembly-line organization where the steps become divorced from each other, with little opportunity for lateral communication. As far as doctrine goes, that is neither necessarily good nor

necessarily bad; it is simply another datum to examine in terms of what a JAOC *should* look like.

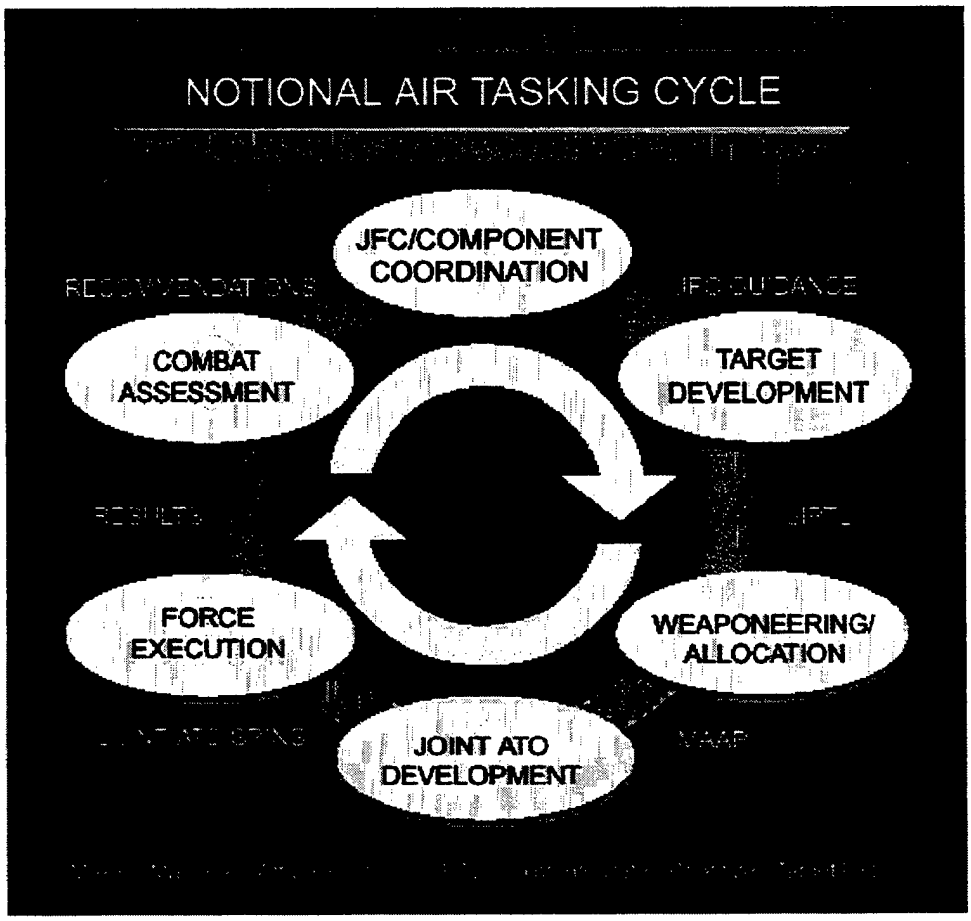


Figure IV-3. Notional Air Tasking Cycle

Figure 4.[26] Air Tasking Cycle

Meeting The Challenges

Having looked at the JFACC and JAOC in current doctrine, we may now examine possible solutions to the shortcomings identified earlier: the JAOC's unwieldy size, long planning times for the air tasking cycle, service and

component organizational stovepipes, and immature doctrine. The emphasis will be on functional and conceptual solutions, rather than technical ones.

Slimming the Organization

Today's military organizational buzzword is "reachback." The conjunction of technological advances in communications systems with deep personnel and budget cuts has prompted much research into ways of performing all or part of certain missions from home station rather than in a given area of operations. There are several advantages to such an approach: reduced deployment footprint, no spin-up time (assuming the function normally exists at home station), and the ability to manage multiple operations with only an incremental staff increase (multiple redundant facilities and hardware can be reduced or eliminated).

Can it be done with the JAOC, though? Scott Britten seems to think so:

> The actual number of personnel who can be left in garrison depends on the specific configuration of the reachback system, the JFC's concept of operations, and the JFACC's decision on how to best support the JFC. However, knowledgeable observers, including General Croker and the US Central Command's JAOC Director, estimate that as many as 800 of the 900 total personnel of a typical JAOC could probably operate from the CONUS with the help of a reachback system. The remaining 100 are the JFACC's senior staff, combat operations monitors and expediters, and liaison officers, but this figure represents a 90 percent reduction in deployed personnel.[27]

The trick, of course, is to determine which functions, if any, are required to be in-theater with the JFACC, and which are best (or easily) performed from home station.

The obvious candidates for reachback are the future planning functions, and many of the targeting and weaponeering tasks. Much as Checkmate, the Air Force planning cell at the Pentagon, built the initial DESERT STORM air plan, permanent headquarters planning cells could alleviate the need for the traditional combat plans division of the JAOC. Similarly with weaponeering functions after the joint integrated prioritized target list is published: since the air tasking cycle is already overlaid upon a compartmented organization, nothing is gained or lost by leaving parts of it at home station, where, presumably, there are more resources available for the tasks. Certain intelligence inputs to the planning and targeting processes also lend themselves to remaining at home station; much of the intelligence collected in-theater must be processed in the CONUS anyway.

Reducing Planning Times

Current thought on ways to reduce the standard 72-hour ATO cycle is depicted in Figure 5. Unfortunately, this approach is simply a time-compressed version of business as usual for the ATO. The ATO is treated as a distinct entity, separated from and sequential with past and future ATOs. Again, the assembly line image springs to mind.

What is needed is a new approach without discarding the entire process. Rather than discrete iterations of the same process, as shown below, the planners need a method whereby they can view targets and assets on a

continuum. In the near term, certain actions, such as approving and publishing the ATO, will remain discrete. One can easily envision a mid-term solution,

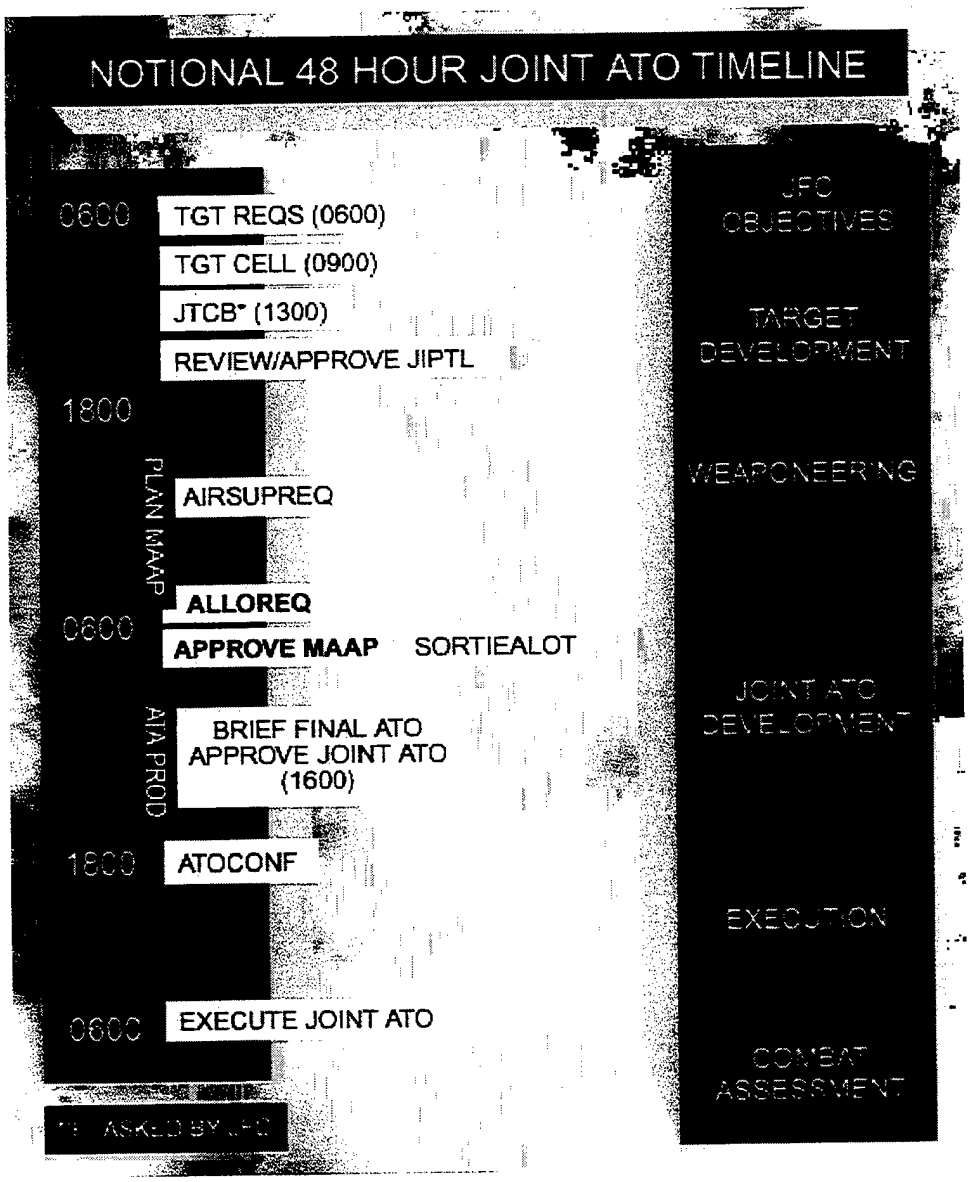


Figure IV-4. Notional 48 Hour Joint ATO Timeline

Figure 5.[28] ATO Timeline

however, wherein the entire process is web-based and continuous: the Master Air Attack Plan (MAAP) will be multi-day, based upon the JFACC's implementation of the JFC's intent and guidance, and flexible enough to accept input at nearly any point in the cycle as a given segment approaches execution. In fact, the Theater Battle Management Computer System (TBMCS), already being phased in to replace the existing Contingency Theater Automated Planning System (CTAPS), will provide some of this capability.[29] Eventually—in the mid-term future—the ATO will become unnecessary as a document, and should be replaced by a web-based system of digital execution orders for the current phase of the MAAP. One of the benefits to a continuous, as opposed to discrete, approach will be the JFACC's ability to judge the relative value of targets over time as the operation unfolds, and provide the ability to capitalize on fleeting opportunities.[30]

Reducing Stovepipes

The key to a responsive organization will be the free flow of information horizontally as well as vertically. It is unrealistic to envision a truly flat military organization, but not to eliminate unnecessary layers of command. As a matter of fact, there is already a move toward "distributed, joint C^2 systems [that] can eliminate a couple of echelons of command and flatten the architecture."[31] Even Terrie Gent, in her article outlining the judge advocate's role in the JAOC, hints at the key to effective flat organizations when she suggests that they should not confine themselves simply to providing legal

advice, but should be full members of the joint team.[32] Common training and a common skill set, built around individual expertise, are the secrets to productivity in an unstructured environment.

J. L. Whitlow brings out another key to reducing stovepipes in the JAOC: "Who's in charge? Operationally, *anyone* can be. The vision is simple: any component can supply a JFACC; systems are interactive and interoperable; components contribute efficiently to the joint air effort; and components fight in terms of their own organization, training, and equipment."[33] Where he misses the joint boat, however, is in the last clause, where he tacitly discards the notion of joint training and joint tactics, techniques, and procedures in favor of tradition. But the key point remains: the JAOC is a joint organization, and one of the necessary conditions to reducing stovepipes (especially service stovepipes) is shared faith in the system, gained through doctrinal understanding and joint training and exercises.

Refining Doctrine

Joint doctrine regarding the JTCB should be refined into more specific guidance. If the JAOC is to take advantage of organizational and technological efficiencies to plan and execute simultaneously across a multi-day continuum, the JTCB must be an integral part of the organization. The JFC should remain available, of course, as the final arbiter of apportionment decisions, but such action should rarely be necessary.

Under this refined concept, the JTCB would consist of the senior component liaison officers, including an equivalent member of the JFACC's service. The JFACC would pass on the JFC's phasing and synchronization guidance (commander's intent), as well as provide broad guidance as to how the joint air operations plan implements that intent; the JTCB would then prioritize the target list with input from each of the components. Like the air tasking process, this should not be a series of discrete actions, but rather an ongoing process of dynamically prioritizing targets across a multi-day continuum in accordance with the commander's intent and the current situation in the area of operations.

The New JAOC

Figure 6, below, shows a rough outline of the new JAOC, incorporating the changes discussed above. Obviously, the diagram depicts only the JAOC itself; other components are plugged in through the JTCB and the component liaisons working in the JAOC. The keys lie in fully integrating all component liaisons, in stripping off functions better executed via reachback, and in working the MAAP (and the ATO) as a multi-day continuum rather than a widget on an assembly line.

The goal is for the new organization, in combination with currently available (or soon-to-be-available) technology, to "lead us from the linear, hierarchical, 'plan-centric' world of the analog to the parallel, collaborative, 'execution-centric' world of digitization."[34]

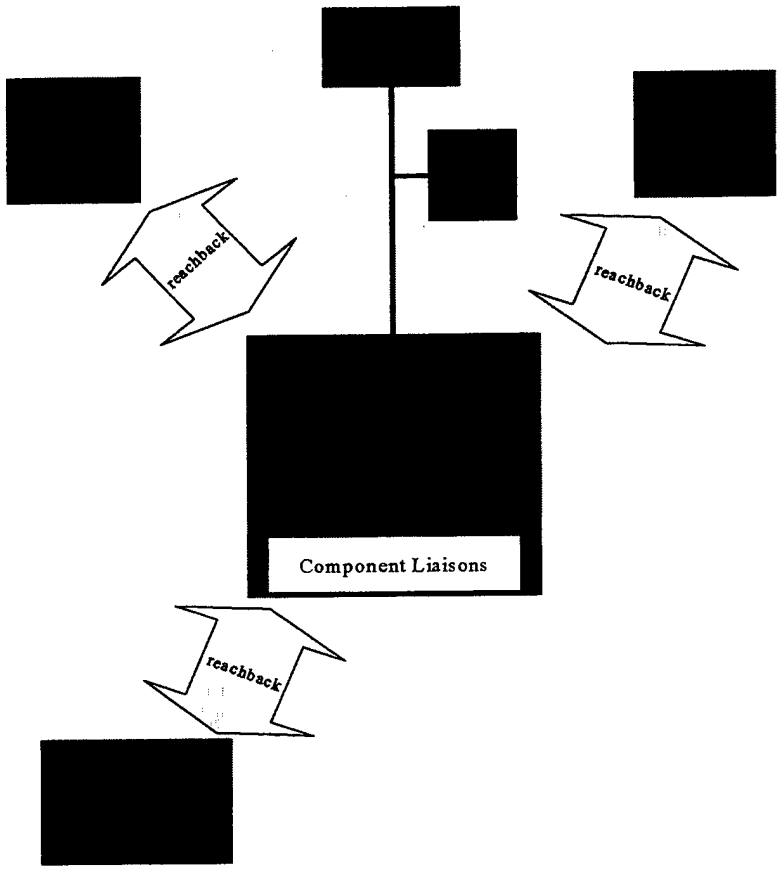


Figure 6. Proposed JAOC Organization

Virtual

As we've seen, the 21st century JAOC is a virtual organization. It is important to remember that, even though parts of the organization are accessed via reachback, they are part of the whole—not separate organizations. The concept is that the central, or headquarters JAOC will provide the static and planning functions, while sending out "detachments" consisting of the JFACC

and that part of the staff (the traditional combat operations functions) necessary to prosecute the war in the area of operations.

Modular

The deployable "detachments," consisting of the staff mentioned above, along with standardized communications and computer equipment to enable the reachback, form the warfighting element of the new JAOC. Because they are small, self-contained, and connect to the home station for much of their capability, they are ready-made to tackle multiple simultaneous crises. Since the bulk of the capability is not located in the area of operations, and is both safe and connected to a mature infrastructure, surging is simply a matter of augmentation at home station rather than training and deploying people from disparate units around the world.

Responsive

The new organization, by discarding the traditional assembly-line approach to planning air warfare, will automatically become more responsive to changing conditions in the area of operations, or to changing political situations at home or abroad. Rather than scrambling to change a massive ATO when something changes, the staff can merely update the information in the shared database, and it will integrate seamlessly into the MAAP. Because the same people have visibility over a multi-day window, rather than simply nursing a

one-day product through the system, implications and repercussions of changes are immediately apparent.

LIMFACs

The JAOC must operate in the real world, rather than a classroom. As with all things in the real world, there are limiting factors, which must be overcome or acknowledged as planning factors. The toughest of them follow.

Service Rivalries

Unfortunately, the thing that provides the impetus for increased joint operations is the same one that exacerbates service rivalries: competition for ever decreasing budget dollars. JFC buy-in to the JFACC and JAOC structure will be critical in the near term, as will joint training to foster understanding among the services. Competition for scarce resources (in this case airpower) has always been a factor in military operations, but in organizations that rely heavily on reachback for mission accomplishment, the possibilities for mischief or misunderstanding stemming from service rivalries increase dramatically. It will be important to foster good inter-service working relationships during training, so that misunderstandings do not hamper the effectiveness of this much smaller organization, which relies upon maximum effort from each member. Marcus Hurley put it nicely: "Each functional component (land, sea, air, space, and special operations) must understand and believe that aipower will be used where and when it is needed to achieve a CINC's or JFC's objectives.

That is the promise which we airmen, regardless of our service, must keep. We begin by training to a common standard and then maximizing airpower during contingencies and exercises."[35]

Bandwidth Requirements

There is no escaping the fact that the bandwidth requirements for a modular JAOC will be huge. Fortunately, it is not a factor for those sections who stay at home station and perform their functions via reachback from the theater; they are already located in permanent, highly-developed areas. Not necessarily so for the deployed element. One can be reasonably confident that any large-scale conflict will mean the required infrastructure will be either present or built up quickly, but what of the smaller operations? Bandwidth and connectivity may be issues. It may be possible to run the smaller JAOC from offshore, or it may be necessary for the JAOC to stage incrementally closer to the theater as conditions improve.

Training Requirements

As the JAOC becomes increasingly computerized, and planning for air operations becomes more virtual than physical, the learning curve will become steeper. Additionally, the need to keep enough staff members trained to provide surge capability beyond the standing JAOC staff will increase the training requirements. Fortunately, the current explosion of web-based technology throughout consumer goods indicates that upcoming year groups of JAOC staff

will be more comfortable with such technology than the current generation. Finally, the need for shared skill sets amongst the JAOC staff due to its drastically reduced size will also contribute to increased training requirements for the theater.

Coalition Issues

Coalition warfare in a JAOC with integrated systems and a common operating picture will also be a potential limiting factor due to security concerns. Since much of the data will be fused off-site, then fed to the JAOC, there will be little capability to remove certain sources selectively. Certainly, there will be few, if any issues operating with the U.K., Australia, New Zealand, or Canada, our traditional partners in military operations around the globe, but what of a U.N. operation in conjunction with Egyptian air forces, or Russian air forces? Potential JFCs and JFACCs should consider these issues now, because there are no easy answers to this one.

Conclusion

This has necessarily been a broad-brush look at one way to re-think the concept of the JAOC for the 21st century. Any detailed treatment of the myriad issues surrounding an organization as large and as complex as the JAOC is simply beyond the scope of this project. Should further investigation be warranted, the Air Force C^2 Battlelab specializes in proof-of-concept demonstrations of innovative command and control solutions.[36]

Future conflict, if trends continue, is more likely to resemble operations in Kosovo or Somalia than Iraq or Vietnam. Additionally, combat deployments are increasing as personnel and budgets continue to decline. To meet the new challenges likely in the coming years, the JAOC must shed the mantle of service tradition to become virtual, modular, and responsive. Operating as modular cells connected to the central hub at home station, multiple simultaneous JAOCs could conduct operations in situations that would be impossible under the current system, due to the sheer size and equipment requirements of today's JAOC.

Notes

[1] U.S. Joint Chiefs of Staff. *Command and Control for Joint Air Operations*. Joint Pub 3-56.1 (Washington, DC: 14 November 94), vii.

[2] ibid.

[3] ibid, viii.

[4] Jeffrey E. Stambaugh. "JFACC: Key to Organizing Your Air Assets for Victory." *Parameters*, 24 (Summer 1994): 99.

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[6] Joint Pub 3-56.1, viii.

[7] Stambaugh, 100-1.

[8] ibid.

[9] Linda D. Kozaryn. "Kosovo Lesson: Go for Snake's Head First." *Sea Power*, 42 (December 1998): 16.

[10] U.S. Department of Defense. *Kosovo/Operation ALLIED FORCE After-Action Report*. Report to U.S. Senate Armed Services Committee on 14 October 1999 (http://www.fas.org/man/dod-101/ops/allied_force.htm [28 December 2000]), xix.

[11] ibid, 18.

[12] Britten, Scott M. "Reachback Operations for Air Campaign Planning and Execution." *Air War College Center for Strategy and Technology Occasional Paper No. 1* (Maxwell AFB: Air University Press, 1997), 15.

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[18] Joint Pub 3-56.1, II-3.

[19] Hurley, 60.

[20] Joint Pub 3-56.1, II-6.

[21] ibid, IV-2.

[22] David K. Gerber. *Adaptive Command and Control of Theater Airpower* (Maxwell AFB: Air University Press, 1999), 36.

[23] Houle, 88.

[24] *Kosovo/Operation ALLIED FORCE After-Action Report*, 56-9.

[25] Hurley, 60.

[26] Joint Pub 3-56.1, IV-4.

[27] Britten, 37.

[28] Joint Pub 3-56.1, IV-5

[29] Lok,59.

[30] J. Taylor Sink. *Rethinking the Air Operations Center: Air Force Command and Control in Conventional War* (Maxwell AFB: Air University Press, 1994), 40.

[31] Zachary Lum. "We Want the Airwaves: Defense on the C^2 Front." *Journal of Electronic Defense*, 19 (June 1996): 40.

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