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Creating a Comprehensive Decision Analysis Playbook for the JFACC

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Abstract

Operational decision analysis is one of the most preeminent challenges facing the Joint Forces Air Component Commander (JFACC) in campaign planning. Furthermore, while the JFACC utilizes operational art and doctrinal processes to design a campaign, there exists no means to record the results of decision analysis to use later during execution. Operational Design and use of the Cognitive Map provides a perfect tool for the JFACC to use when designing an air campaign. This paper analyzes the application of the Cognitive Map to the air campaign planning process with the goal of producing a Decision Support Matrix the JFACC should use in formulating preplanned decisions and subsequently use for emergent opportunities. These matrixes become the JFACC's playbook.

Introduction

On 27 March 1999, Lt Gen Michael C. Short, USAF, retired, then Combined Forces Air Component Commander (CFACC) over the air war in Operation ALLIED FORCE (OAF), made a successful decision to launch a recovery operation to return the pilot of an F-117 shot down over Serbia. However, this decision was not an easy one, and was in fact one of the most difficult decisions the commander made due to the information available supporting his decision and the level of risk associated with the outcome of the recovery operation.[1] The decision was difficult because a young major pressed Gen Short to make an execute decision on the recovery of the F-117 pilot. The tactical-level of risk included the possibility of losing a helicopter while the strategic-level of risk included failing to recover the pilot which could be detrimental to the rest of the coalition continuing the fight.[2] Gen Short understood that A-10s would oversee the recovery operation while helicopters retrieved the pilot. Unfortunately, Gen Short recognized that he did not war-game this scenario and the recovery operation took longer than it should have due to complications. He made a gut-call on launching the helicopters despite not having the precise location of the downed pilot, an initial lack of air cover, and no effective method of command and control. In the end, Gen Short's team recovered the pilot notwithstanding the abort of one helicopter due to a low fuel state because it took off too early. Gen Short's lesson from this event is that the CFACC and planners "must never stop what-ifing…we didn't do enough."[3]

Operational decision analysis is one of the most preeminent challenges facing the Joint Forces Air Component Commander (JFACC) in campaign planning. Furthermore, while the JFACC utilizes operational art and doctrinal processes to design a campaign, there exists no means to record the results of decision analysis to use later during execution. There is no doubt

in today's technologically advanced world that there is an abundance of access to information. However, those people and systems that gather and organize data into useful information can overwhelm recipients if they do not frame the information into a useful product. The JFACC's staff, acting on his or her behalf in receipt of this information, also needs training and understanding of the information and decisions required to best support the commander. Joint Publication (JP) 5-0 informs that, "The role of the staff is to support the commander in achieving situational understanding; in decisions in a given situation or making decisions faster and better than a thinking, adaptive enemy in an environment of uncertainty…"[4] Additionally, this doctrine provides guidance on developing decisions into a campaign plan though Operational Art, "the application of creative imagination by commanders and staffs – supported by their skill, knowledge, and experience – to design strategies, campaigns, and major operations and organize and employ military forces."[5]

Doctrine makes a great leap of trust with the statements above in assuming the staff is able to assist the commander by owing creativity to Operational Art when a staff may not possesses the skill, knowledge, and experience required to produce a campaign plan. Therefore, the seven-step Joint Operational Planning Process (JOPP) and Operational Design are two frameworks for arranging the 17 operational design elements to help bridge the gap at the Joint Planning Group (JPG) level. A staff is best able to arrange these 17 elements upon creating a Cognitive Map, as covered in Dr. Jeffrey Reilly's monograph *Operational Design — Shaping Decision Analysis through Cognitive Vision*. Furthermore, Operational Art and Design are applicable in subsequent component planning functions. However, JP 3-30, *Command and Control for Joint Air Operations*, air's doctrine, does not incorporate Operational Design despite a recent revision adopting a similar 7-step JOPP.

Operational Design and use of the Cognitive Map provides a perfect tool for the JFACC to use when designing an air campaign. This paper analyzes the application of the Cognitive Map to the air campaign planning process with the eventual goal of producing a Decision Support Matrix the JFACC should use in formulating preplanned decisions and subsequently use for emergent opportunities. This Cognitive Map also provides the JFACC's staff with a method to grasp the complexities of fighting an adaptive enemy within a complex and uncertain environment without having to rely on Operational Art alone.

Perceptions of Operational Art

The doctrinal definition of Operational Art leads one to believe it is something only a senior commander—one with skill, knowledge, and experience in the operational campaign-design arena—may possess. It is the genius of the commander to comprehend the dynamics of the enemy, friendly forces, the operational environment, and overarching guidance to design a successful campaign plan. Some researchers codify Operational Art within two primary views of rapid cognition, or intuition, and deliberate rational analysis as a way to explain the complexity of making decisions.

Malcolm Gladwell, the author of *Blink: The Power of Thinking Without Thinking*, presents decision-situations owing to the logic of intuition, or *Coup D' oeil*, as a means to decipher solutions to complex problems through rapid cognition. "Decisions made very quickly can be every bit as good as decisions made cautiously and deliberately."[6] The author presents many convincing examples of the power of rapid cognition, or precise comprehension of the nature of a problem and a simultaneous solution. However, his examples also illustrate that people utilizing this approach are experts in their fields having devoted decades of study into their specialties. These experts possess the skill, knowledge, and experience to make snap

decisions, just as a military commander may possess. But, Mr. Gladwell leads his readers astray during problem analysis. Sure, a few experts where able to quickly determine something didn't look right, as in the case of a seemingly genuine Greek *kouros* statue purchased by the J. Paul Getty Museum. However, there were a lot more experts that were unable to decipher, that in fact, the statue was a fake. Intuition does not always result in success despite basing opinions on a solid and informed foundation. Furthermore, when people must describe the thought process behind their intuitive judgments, they are unable to correctly identify their subconscious decision criteria.[7] This is a problem if a military commander must convey a plan in order to build unity of command in organizing forces around a coherent campaign.

In a more relevant example of the success of rapid cognition, Mr. Gladwell examines the decisions of Lt Gen Paul Van Riper, USMC, retired, during the military war game Millennium Challenge to pay credence to the power of intuition over a complex decision analysis machine based on technology. Gen Van Riper, as the Red team commander, empowered subordinates to make rapid decisions based on immediate comprehension of available information in order to overwhelm the Blue team which had the advantage of technology dominance to aid in decision-making. The Blue team had access to virtually any piece of information in the war game, but found they were too slow to react to Gen Van Riper's wild offensive actions. Gen Van Riper conducted a preemptive attack, sinking opposing ships, as a way to repel the intervening Blue force. The power of an intervening force taking the offense in a deliberate campaign comes through synchronization. This means a commander must retain command and control to accomplish an integrated campaign strategy while still allowing for individual initiative, unlike Gen Van Riper's Red team where the commander was unaware of his force's actions. It is difficult to picture the United States military in a situation where it is repelling an invading force

and acting without the authority of a commander; thus, an offensive frame of reference must persist. The *Blink* concept leaves room for development in its ability to support decision analysis through a knowledge-based background even though it resembles the doctrinal definition of Operational Art. Perhaps more deliberate and rational-thinking analysis is required.

In a counter to Gladwell's *Blink* idea, Michael LeGault, in his book *Think: Why Crucial Decisions Can't be Made in the Blink of an Eye*, proposes the value of deliberate reasoning to arrive at problem-solutions. In a blink, it is impossible to impart enough time for reasoning to occur in critical thinking. In effect, the process of reasoning allows the opportunity to break down a seemingly complex problem into manageable parts to identify underlying causes of problems and identify a true solution. "Only when a person has constructed a conceptual framework do the facts, historical or otherwise, begin to acquire meaning."[8] Mr. LeGault may stretch the linkage between critical thinking and automated technologies suggesting, "The computer has the very real potential to displace hands-on experience and cognitive skills needed for critical and creative thinking."[9] But, the Blue team from Millennium Challenge might be willing to concede that even automation cannot supplant critical human thinking when confronted with an adept adversary like Gen Van Riper. Gen Van Riper faulted the Blue team that "they leaned heavily on systems analysis and decision-making."[10] Perhaps Blue assumptions of Red's capability were inaccurate. There is an element of risk in applying reasoning to a campaign design if assumptions prove to be inaccurate. "Not only is critical thinking needed to rationally assess and understand risk, but accepting a certain amount of risk is a prerequisite for vigorous critical and creative thinking."[11]

As a balance between these two previous works, it is appropriate to acknowledge that intuition is important in military endeavors, but it is not infallible. Furthermore, a conceptual

framework that allows reasoning and creative thinking enables complete analysis of a problem, granted this requires more time. So if a person, or planning team, spent time deliberating over various enemy and friendly courses of action, they could arrive at some very successful solutions using creative thinking. Yet, when confronted with a new or different situation, they could apply some rapid cognition and turn to previously developed solutions, possibly requiring refinement, and apply them to an impending problem. Additionally, the framework that aids in decision-making can identify areas of risk based on environmental conditions to use in formulating decision criteria. Operational Design is that framework and its use is supported in existing doctrine, however, the concept of creating a Cognitive Map is relatively new but amazingly useful upon discovery.

What Does Doctrine Provide?

The 7-step JOPP is the process for developing a commander's estimate. While not specifically stressed within JP 5-0, the advantage of the JOPP comes from war-gaming which leads to decision analysis. Yet, doctrine does not give significant attention to this advantage. An explanation of JOPP is essential because the same process occurs during air component planning and understanding how one process works is instructive for understanding the JFACC's process. The JOPP is an iterative process beginning with initiation. Step 1, initiation, begins when national leadership provides direction and guidance to combat commanders to begin contingency or crisis action planning based on a perceived threat. Receiving strategic guidance is the fundamental purpose in initiation and it is also when a commander, or his staff, can request clarification of any ambiguous national strategic objectives or end-states since this information will drive the results of the remaining six steps of the JOPP. Step 2, mission analysis, is where the bulk of a planning effort occurs and is best summarized as framing the problem. Mission

analysis uses inputs from the Joint Intelligence Preparation of the Operational Environment (JIPOE) to establish known facts of the environment and the enemy to include enemy Centers of Gravity (COG) and Courses of Action (COA). During mission analysis, planners define military end-states, operational objectives, termination criteria, effects, tasks, assumptions, friendly and enemy COGs, decisive points, lines of operation (LOOs), and phasing arrangements. The end products are a commander's intent, mission statement, statement of risk acceptance, and initial Commander's Critical Information Requirements (CCIRs) which include both friendly and enemy information. These initial CCIRs confirm events in the operational environment the commander will use when evaluating decision criteria. Step 3 thru 6 is COA development, analysis and war gaming, comparison, and approval. The staff should develop COAs that offer a range of different opportunities as long as the COA is valid and accounts for deployment, employment, and sustainment. Step 4, COA analysis and war-gaming, is when the staff compares each COA against the enemy's most likely and most dangerous COAs to identify decision points, branches and sequels and governing factors. Step 5, COA comparison, is where the governing factors from step 4 help to determine which COA offers the greatest advantages over disadvantages leading to selection in step 6. The last step of the JOPP is plan and order development which is where the staff then translates the selected COA into a commander's estimate for use in writing the Concept of Operations (CONOPS) which leads to an Operational Order, or full plan development in various stages of completion, depending on the situation. The JPG components use the commander's estimate and CONOPs to develop their specific plans.

JP 3-30 recently re-designated the air campaign planning process from the Joint Air Estimate Process (JAEP) to JOPP for air (JOPPA). JOPPA mirrors the JOPP in JP 5-0 but does not include the concepts of Operational Art and Design. This is an important point not to miss

because Operational Design is the key framework for arranging the 17 elements of Operational Design that kindles critical thinking. JOPPA uses several elements like end-state and objectives, but adds air-specific terms like "target development and prioritization, capabilities analysis, commander's decision and force assignment, mission planning and force execution, and assessment."[12] JOPPA seems similar enough to the JOPP, but the absence of Operational Design creates an empty space where decision analysis occurs.

The Cognitive Map

JP 5-0 does not provide a complete solution. Even though JP 5-0, and the JOPP, includes Operational Design, this publication does not provide coherent instructions on how to arrange and utilize the individual elements other than listing them and providing definitions. It is up to the commander to select a framework for organizing the elements of operational design and the addition of a Cognitive Map proves essential in making the 17 elements work in synchronization to create a complete campaign plan.

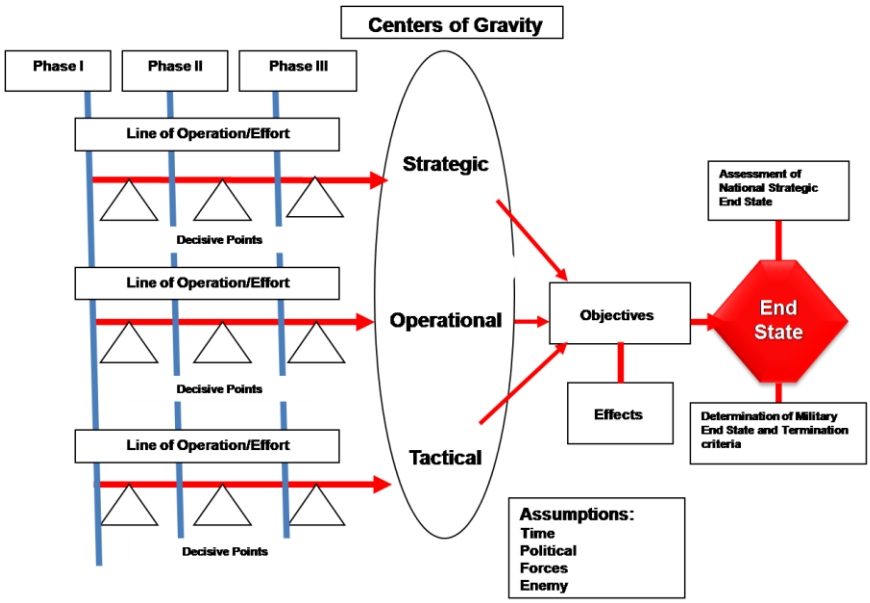

Figure 1. Dr. Jeffrey Reilly's Cognitive Map.

The goal in both JOPP and JOPPA is to link the strategy to the tasks and the Cognitive Map provides that solution. Planners create the Cognitive Map by taking national guidance in the form of objectives and end-states and turn them into operational-level military objectives and end-states. With the use of the national guidance and military operational-level objectives and end-states, planners craft termination criteria for approval by the Secretary of Defense and the President. Termination criteria specify the end of a campaign by either, maintaining an achieved advantage without completing all objectives, or withdrawing forces if the political situation changes such that any future military efforts might be futile towards achieving the desired end-state. Effects are included to help explain what should occur while achieving the military objectives and then tasks break down the objectives into specified, implied, and essential tasks. For the purpose of the Cognitive Map, the key starting point is the end-state. Planners develop objectives from the end-state. The next challenge in the Cognitive Map is developing enemy and friendly COGs at the strategic and operational level. Planners must then analyze the COGs via critical factor analysis to reveal critical vulnerabilities in enemy COGs to exploit, and vulnerabilities in friendly COGs to protect and add to the defended asset list. Finally, planner must group critical vulnerabilities are into decisive points and arrange them along physical or logical lines of operation (LOO) with the additional task of arranging these LOOs into campaign phases. As planners carry out this operational design and create the Cognitive Map, they may find weaknesses in the plan making iteration necessary. It is essential to understand that a change at any point from national guidance causes a ripple effect to objectives, COGs, and LOOs. This ripple occurs intuitively because the military end-state defines military operational objectives, which in turn helps determine COGs to accomplish the mission. The COGs then drive the creation of the lines of operation and thus phasing. The description above is essentially

what occurs within the first two JOPP and JOPPA steps of initiation and mission analysis. The Cognitive Map now provides a means to succinctly describe the campaign's objectives, focus of effort, and sequencing used in COA development.

Decision Analysis in War Gaming and the Decision Support Matrix

The previous description of mission analysis and some of the elements of operational design pave the path to success but at no point specify how, or what means the JFC should use, to accomplish the tasks and objectives. Defining the "how" occurs during COA development. With several valid COAs complete, the staff then conducts war-gaming to highlight advantages and disadvantages of each COA and uses this most crucial step to begin decision analysis.

A Red and Blue cell conducts war-gaming via the action-reaction-counteraction cycle. In this step of the JOPP, the Blue planners match their COAs against the Red COAs. Typically, the planners design their COAs with the Red COAs in-mind. However, the reality of a war game helps reveal actions the opposing side can see, establishes conditions for subsequent actions, and identifies Blue's vulnerabilities to Red capabilities. This is where Mr. LeGault's idea of deliberate rational-thinking, or reasoning, is important. The planners complete a decision support template capturing the war-game cycle that includes friendly and enemy actions along with the conditions and observations from each opposing side. It is possible to develop a rough "if-then" type of formula including the conditions that establish the "if," and the actions to take during the "then." Not surprisingly, these situations become decision points to add to the Cognitive Map. By developing the conditions surrounding a decision, planners understand the areas where they must observe enemy action in order to receive indications of a potential decision situation. These broad areas become Named Areas of Interest (NAI) while designating a specifically affected location as the Target Area of Interest (TAI). All of these elements

combine to form the Decision Support Matrix (DSM). Time is the only limit to the number of DSMs a staff may create.

DP	TAIs	Event	Decision Req	Decision Criteria	Assets	CFC/GCC Actions
☆ 1 FEBA X	#1 XXXXX #2 XXXXX	Vul 1OEF threatens to penetrate FEBA X-ray along Coastal AA	Authorize W.O. to MEB to block penetration of FEBA X along Coastal AA	Vul 1OEF threatens penetration of FEBA X Vul 2OEF preparing to move (Trail Bdes of 325th Mech Corps) I Corps < 70% strength	ACC CAF Corps (US) Atk Avn V Corps	Receive D/CCDR approval to Issue W.O. to MEB and notify CCDR Issue W.O. to : CAF AH-1 Day; III (US) Corps AH-64 Night (1 Atk Avn Bn) Submit ATO input
	#1 XXXXX	FEBA X penetrated by Vul 1OEF 2d Echelon Divs & 101st AR Bde	Authorize JFLCC to commit MEB to Coastal AA	Vul Corps at >70% strength has penetrated FEBA X Air and fires are insufficient alone to stop penetration I Corps < 60% strength I Corps reserve already committed	ACC CAF Corps (US) Atk Avn V Corps	Receive D/CINC approval to issue FRAGO authorizing JFLCC to commit MEB and notify CCDR Reapportion or reallocate air and fires to support MEB

Notes: Assume maximum enemy movement rate (dismounted) in contact to be .5 Km/Hr
Est. Vul movement time between FEBA A and FEBA B 24 Hrs
Est. minimum preparation time for MEB to block Vul penetration of FEBA B 24 Hrs

Figure 2. Dr. Jeffrey Reilly's Decision Support Matrix.

During execution, the commander, or staff, will recognize a developing decision-situation through the use of CCIRs and can make an intuitive "gut-call" on the appropriate response, or find the DSM created previously that details actions for the decision point. If a DSM does not exist for the specific situation, the expert staff that practiced critical thinking, and is aware of the operational environment and force capabilities, is better equipped to develop an on-the-fly sequence of events to deal with the developing situation. However, not all commander decisions require this type of focus, especially in the case of known decisions the JFACC must make regardless of an enemy COA.

Decision Points

There are two types of decisions a JFACC must make, preplanned ones and those made during execution in response to enemy action. In both situations, the JFACC makes the decision because of his or her level of authority and responsibility. Some types of preplanned decisions include when to shift from the deter phase to the seize the initiative phase, moving resources from the Critical Asset List to the Defended Asset List, weight of effort within phases, and

coalition integration. Meanwhile, decisions made during execution usually surround assumptions developed during mission analysis and COA development. Assumptions come from factors of time, politics, friendly forces, and enemy force capabilities. These assumptions are opportunities for the plan to fail and therefore require branch and sequel plans to bring a decision to a logical conclusion. The JFACC should treat assumptions from the JPG as fact, leaving responsibility with the JPG to develop the appropriate branch or sequel. However, any assumptions the JFACC or JFACC's staff create, must entail a branch or sequel plan.

Preplanned Decision Points

Naturally, the environment factors into any decision making it difficult to create a finite set of conditions to simplify the process. However, the Cognitive Map and war gaming are useful for setting conditions to make preplanned decisions. In any campaign, national leaders hope to avoid conflict by deterring an enemy from attempting any hostile action. The failure of deterrence drives the first decision point. The decision criteria generate from indicators of impending hostile action. There are numerous indicators (also known as unambiguous warning) of this nature that are non-reversible such as removing perishable items from stock, putting corrosive fuel in missiles, and the mobilization of forces beyond an historic exercise level. Utilizing these indicators, the Blue force may establish trigger points as an opportunity to preempt a hostile enemy. However, the Blue force must also have critical assets to wage a successful preemptive attack, or defend from an attack should the opposing side preempt. These assets, or capabilities, also become decision criteria for the DSM. Putting all of this together through war gaming completes the DSM by including additions from the synchronization matrix detailing Blue and Red actions. The TAIs come from known, or suspected, locations of enemy

offensive capability and NAIs focus on the areas that support the offensive capabilities in the TAIs.

During a March 2010 Joint Intermediate Staff Planning Exercise (JIPSE) between the Command and General Staff College (CGSC) and Air Command and Staff College (ACSC), officers developed the phase transition plan for such a scenario described previously. The coalition forces opposing the fictional country of Ahurastan set phase triggers as any Ahurastan border crossing with conventional forces or surface-to-surface missile (SSM) launches out of Ahurastan. Additionally, through war-gaming, the coalition learned that Ahurastan's triggers were any massing of coalition forces in the defended country of Azerbaijan. The coalition operational COG was the US ability to conduct power projection thus making Sea- and Aerial-Ports of Debarkation (SPOD/APOD) critical to include on Defended Asset List (DAL).

The JFACC must give deliberate consideration to the DAL in order to strategically position limited Theater Missile Defense (TMD) assets if the Joint Force Commander assigns the JFACC the role of Area Air Defense Commander. Additionally, the DAL may change during each phase. During the joint forces' deployment, logistics avenues and force concentrations makeup a majority of locations on the DAL. As phases evolve to kinetic actions, the JFACC may adjust the DAL depending on decisive points, friendly objectives, and likely enemy actions to achieve their objectives. During the JIPSE war game, Ahurastan's initial volley of SSMs not only targeted APODs, but also coalition countries which threatened the friendly strategic-COG. As a result, the JFACC directed naval TMD assets to protect two neighboring countries while army TMD assets continued to protect APODs and SPODs. The JFACC can articulate the level of risk based upon the availability of TMD assets to provide force protection for the DAL. Sometimes, just arranging for TMD assets can prove to be a struggle for the JFACC.

During Operation Desert Fox, Lt Gen Robert D. Bishop Jr., USAF, retired, was the Director of Mobility Forces (DIRMOBFOR) and had to contend with a difficult decision over the necessary number of strategic lift aircraft to bring TMD assets into theater. Gen Bishop's decision depended on the amount of lift available, and most importantly, when that lift was available amongst competing priorities. To compound the problem, a ground force commander was demanding immediate resolution, yet, he could not provide a time frame to close out the shipment due to the level of classification surrounding the operation's timing.[13] Gen Bishop established a responsive system to deliver the assets before the operation's first bombs fell. He compiled various arrangements of aircraft for the known load of Patriot missiles and spoke to his stateside representative who knew of the operation's timing in order to arrive at the right number of aircraft to complete the shipment.[14] While the threat of enemy SSMs did not go away, the ground force commander could assure his forces, and citizens of the host nation, that adequate force protection was in place. The decision criteria in this scenario included the number of days to move the cargo, the number of assets available, and the closeout date tied to the operation's initiation. A Cognitive Map in this scenario, with TMD assets listed as a decisive point, could help the ground commander, DIRMOBFOR, and controllers of strategic lift to work in synchronization based on the JFACC's and thus the Joint Force Commander's top priorities. These priorities emerge as a weight-of-effort on the JFACC's Cognitive Map.

The starting point in determining weight-of-effort is the lines of operation derived from COGs, and objectives. Air and space power functions such as counterair, counterland, and strategic attack are the most useful logical lines of operation on air's Cognitive Map. The decisive points on each of these lines provide a measure to the amount of force required to achieve each phase's success criteria. In the initial shape and deter phases, force deployment

consumes a majority of air's planning and logistics efforts. The decisive points direct the type of capabilities necessary to achieve the phase objectives and eventually defeat the COG. Establishing air superiority is an implied task and therefore a prerequisite for having any positive effect on other target sets whether they are an integrated air defense system (IADS), enemy air force, strategic target, maritime defense force, or shaping mechanism to support invading ground forces. Given the size of the enemy's air force and number of strategic defense assets, the JFACC can recommend to the JFC the number of offensive counterair assets to request and apportion. Subsequently, the JFACC determines the number of air assets to support later phases and can articulate a needs-based flow of aircraft, versus trying to deploy all forces during the shape and deter phases. Even though air provides a unique capability in terms of range, speed, and flexibility, there may be other capabilities for the JFACC to incorporate such as the integration of coalition air assets.

The JFACC has three possible outcomes regarding coalition air: use it freely, use it with conditions, or not use it at all. Naturally, coalition countries contribute forces and resources to conflicts and expect the JFACC to use them. However, the JFACC must not accept additional risk if the coalition country contributing aircraft has not prioritized the development of its military force.[15] During OAF, Gen Short faced this very scenario and understood that he "could not turn down the help."[16] The Hungarians presented Mig-29s to the Gen Short; however, the Serbians also flew Mig-29s. Gen Short set conditions for the use of Hungary's Mig-29s to include clear weather, timing de-confliction, and a robust air support package to provide early indication of airborne Serbian Mig-29s. Unfortunately, Gen Short had to thank other countries for contributing aircraft and admitted he could not use them due to the increased risk he would have to accept in agreeing to use aircraft with shortfalls. Those shortfalls could have been

avoided it the contributing nation had spent sufficient money to develop a robust capability.[17] In other situations, Gen Short made an acceptable agreement, to replace aircraft he could not use with aircraft he vitally needed and ones that were available, by simply making a request. Thankfully, Gen Short had nurtured a strong relationship with his coalition partners, like the Germans, who upon request replaced some unused reconnaissance aircraft with High-speed Anti-Radiation Missile capable aircraft.[18] This experience was extremely valuable for Gen Short because, out of frustration, he made the discovery that some nations may initially offer aircraft based on political or constitutional limitations and when the CFACC makes a request, the aircraft restraints go away. The lesson here is to speak up and voice concerns since things are not always as they seem. Some people may erroneously accept their situation without realizing change is possible.

Emergent Opportunities

If the JFACC and supporting staff invest a lot of time towards developing DSMs, they are better prepared to handle time-sensitive decisions and emergent opportunities. Ideally, if the staff has continuously "what-ifed" many scenarios, as Gen Short recommends, they should have a DSM that closely resembles any likely scenario. They may have to adjust the DSM slightly to make it relevant to the actual conditions. However, even if they have not covered every scenario by contemplating every sortie or mission from "takeoff to landing" they still stand the chance of being better prepared since doctrine instructs that people are what matter in war gaming, not the actual tool.[19] The DSM is absolutely vital and what makes the DSM valuable are inputs from a Red and Blue cell that work cohesively, understand how their boss thinks, and also comprehend the complex environment. The main areas to consider when facing an emergent opportunity are timing and effect. How much time does it take to generate a capability and how much time

remains before that capability no longer has an effect? What effect will enemy actions have on denying an opportunity and what is the desired effect the Blue cell hopes to achieve? A Blue cell well versed in joint capabilities can select the best asset to use given a time constraint. The speed, range, and flexibility of airpower make it a likely choice. However, Navy cruise missiles, and Army fires (Multiple Launch Rocket System and Army Tactical Missile Systems) may provide a more responsive capability if an Air Force aircraft is not already airborne. Any combination of these systems is useful for strategic attack, or attacking high value and time-sensitive targets. Also, a Red cell that understands enemy capabilities and intentions can offer realistic inputs for consideration.

A Possible DSM for Gen Short

Gen Short admitted he did not war-game enough and instead preferred the Bunch of Guys Sitting Around a Table (BOGSAT) method with a close group of trusted officers that he took with him for OAF.[20] Furthermore, in hindsight, he did not receive and did not request training for his position that would have been essential for running the OAF air campaign.[21] All he had was 33-years of experience in which to build his understanding of Operational Art. Even Gen Short's boss, Gen Jumper admitted, "…we all trained ourselves...Because our system did not train us."[22] As a senior mentor, Gen Short promotes the idea of war gaming and the Operational Design concept taught at intermediate developmental education courses. Additionally, the Warfare Studies Institute at Maxwell AFB, Alabama teaches the Joint Flag Officer Warfighting Course, the Joint Forces Air Component Commander Course, and Combined Forces Air Component Commander Course to better prepare senior leaders for theater-level combat leadership and operational-level war fighting. Without having the opportunity to war-game Gen

Short's recovery operation in OAF, the following DSM is a product that a trained staff could produce to cover any rescue mission in OAF, not just the F-117 shoot-down.

DP	TAIs	NAIs	Event	Decision Req	Decision Criteria	Assets	Actions
CSAR	Aircrew 1 last known loc	3 X 3 km around aircrew 1 last known loc	Coalition aircrew in hostile territory	Launch RESCAP assets	positive confirmation of downed aircrew	non-NATO AWACS	recovery assets on standby
Warning	Aircrew 2 last known loc	3 X 3 km around aircrew 2 last known loc			enemy closure rate on TAIs	2 X HH-60	Notify JFC
	Aircrew 3 etc.	Enemy FOBs IVO of aircrew				SANDY type acft	Order launch of RESCAP, C2, and other support acft as req'd
CSAR	Aircrew 1 last known loc	3 X 3 km around aircrew 1 last known loc	survivor location determind, or, survivor capture imminent	Launch rescue assets	time to recover aircrew	non-NATO AWACS	Order launch of recovery assets.
Execute	Aircrew 2 last known loc	3 X 3 km around aircrew 2 last known loc			time to capture by enemy	2 X HH-60	Notify JFC
	Aircrew 3 etc.	Enemy FOBs IVO of aircrew			weather minimums for extraction	SANDY type acft	

Figure 3. Possible Decision Support Matrix for OAF recovery operation.

The DSM covers two types of action, those in a warning phase and those in an execution phase. During the warning phase, the CFACC sets the conditions for carrying out a successful recovery operation. On 27 March 1999, A-10s that would provide cover for the rescue helicopters sat ground alert since previous nights' missions were uneventful and everyone was only expecting a 5-day war. Additionally, the command and control platform airborne at the time did not contain the necessary communications equipment to allow all participants to talk to each other. The end result was a 3-hour delay in recovering the F-117 pilot. During the warning phase, the priority is obtaining the precise location of the downed pilot and preparing the airspace for a quick pickup. If the operation requires additional suppression, counterair, and refueling assets, they should also launch. Perhaps an unpredictable enemy will complicate the situation; therefore the element of time is included to assist in determining when to proceed to the execution phase. By waiting until a precise survivor location exists, the rescue helicopters can reduce the chance of missing a pickup by ensuring sufficient fuel reserves and a favorable weather condition. This simplistic DSM is not the final solution but is better than relying on a "gut-call" from someone who may not have all the facts.

Conclusion

The JFACC needs a decision tool that is useful, relevant, and timely to assist in removing the challenge of operational decision analysis. The doctrinal processes are notable but not complete. JP 5-0 provides the best model for translating Operational Art into a coherent campaign plan via the 7-step JOPP and Operational Design. JP 5-0 should also incorporate the Cognitive Map concept as covered by Dr. Jeff Reilly. Using the Cognitive Map in conjunction with the action-reaction-counteraction war-gaming process enables decision analysis and the recording of results in a Decision Support Matrix to use at a later time. Collectively, the previously mentioned items can support the JFACC's staff as they develop their skill, knowledge, and experience to creatively build solutions and courses of action. It is too easy to explain-away a responsibility by saying Operational Art is the answer. Rightly, doctrine recognizes this; but assumes the commander will have time to impart guidance to a large staff. This may not always occur and without knowing how the JFACC thinks, and what he or she values, the staff will need to understand the decision system to provide the JFACC with options. During Gen Short's time in command during OAF, the Air Force did not completely train all senior leaders to handle the complex environment.

The *Blink* and *Think* books offer some different perceptions of how operational decision analysis works, quickly or in a structured format. While both offer useful inputs, neither one captures the right answer. A commander needs more time than the blink of an eye to analyze a situation and develop a solution. Critical reasoning is also important but a commander must not fall into the trap of assuming decision analysis can occur with automation. A blend of the two perceptions works best for a military commander because critical reasoning enables comprehension of complex problems, yet intuition also has value when the commander has

previously analyzed all of the variables surrounding a decision. The "gut-call" decision made by Gen Short to launch the recovery operation was extremely difficult because there were no war-gaming results and decision criteria to support him. Nonetheless, he accepted the risk of the mission which is the responsibility of the JFACC but the process should be better.

The examples of preplanned decisions and the Decision Support Matrix in this paper do not provide absolute answers, but merely illustrate the considerations of decision analysis. In a normal campaign design process, the end result from multiple war-gaming scenarios is a comprehensive analysis of all variables influencing JFACC decisions. With this analysis complete, the staff may retain the various DSMs to pullout, dust off, and update for current conditions. Mastering Operational Art and *Coup D' oeil* are worthy goals, but a staff may not initially have the skill, knowledge, and experience necessary to fully support the JFACC. By clarifying the essential decision criteria, the staff can minimize the volume of information coming to the JFACC and remove extraneous information to focus on the truly critical information requirements. The goal of the JFACC staff should be compiling the results of war-gaming into multiple Decision Support Matrixes in order to hand the JFACC a playbook covering any likely situation.

End Notes

(All notes appear in shortened form. For full details, see appropriate entry in the Bibliography.)

[1] Lt Gen Michael C. Short, USAF, retired, interview by the author, 25 Mar 2010.
[2] *Ibid*.
[3] *Ibid*.
[4] JP 5-0, III-3.
[5] *Ibid*, IV-1.
[6] Gladwell, *Blink: the power of thinking without thinking*, 14.
[7] *Ibid*, 121.
[8] LeGault, *Think: why crucial decisions can't be made in the blink of an eye*, 85.
[9] *Ibid*, 143.
[10] Lt Gen Michael C. Short, USAF, retired, interview by Scott Willis, *Frontline*, PBS 17 Dec 03.
[11] LeGault, *Think: why crucial decisions can't be made in the blink of an eye*, 249.
[12] JP 3-30, xix.
[13] Lt Gen Robert D. Bishop Jr., USAF, retired, interview by author, 26 Mar 2010.
[14] *Ibid*.
[15] Lt Gen Michael D. Short, USAF, retired, interview by the author, 25 Mar 2010.
[16] *Ibid*.
[17] *Ibid*.
[18] Lt Gen Michael C. Short, Commander, Allied Air Forces, Southern Europe, USAF (address, Air Force Association Air Warfare Symposium 2000, 25 February 2000). http://www.afa.org/aef/pub/short200.asp
[19] JP 5-0, III-31.
[20] Lt Gen Michael C. Short, USAF, retired, interview by the author, 25 Mar 2010.
[21] *Ibid*.
[22] Gen John P. Jumper, Commander, Air Combat Command, USAF (address, Air Force Association Air Warfare Symposium 2000, 24 February 2000). http://www.afa.org/aef/pub/jump200.asp

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