



**REQUIREMENTS FOR COMMON BOMBER  
MISSION PLANNING ENVIRONMENT**

Graduate Research Project

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AFIT/IC4/ENG/06-08

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ENVIRONMENT

GRADUATE RESEARCH PROJECT

Presented to the Faculty

Department of Electrical and Computer Engineering

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the

Degree of Master of C4I Systems

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June 2006

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## **Abstract**

The mission planning environment for the strategic bomber is characterized by numerous few man-to-machine relationships, data flows and organizational interactions. Currently, these activities are accomplished by several systems using a variety of data formats. Several tools have been developed to address the complexity of not only bomber mission planning, but tactical (unit) level mission planning as a whole. Synchronized Air Power Management (SAPM) was a process driven, web-based tool intended to integrate command and control systems at the wing level. Theatre Battle Management Core System-Unit Level (TBMCS-UL) was also intended to do these functions as well as emphasizing data to data exchanges with its parent TBMCS-Force Level. Unfortunately, these initiatives have fallen short of seamlessly connecting the tactical level mission planning processes with the operational level or providing the unit-level mission planner with the right information, in the correct format, at the right time. One of the major reasons these initiatives fail is the developers of tactical mission planning systems do not completely understand the business rules, data exchanges and activities that compromise the bomber mission planning process. Through structured architecture, this paper discovered a general set of bomber mission planning environment requirements, common to all bomber Major Weapon Systems (MWS), for use at the tactical level. During analysis of the architecture, several observations were made which warrant greater consideration during future requirements development and/or mission planning system acquisition.

## **Acknowledgements**

I would like to express my sincere appreciation to my faculty advisors, Dr. Robert Mills and Lt Col John Colombi for their guidance and support throughout this project effort. The insight and experience was certainly appreciated. I would also like to thank Maj Tim Barclay, B-2 System Program Office, Mr Robert Weldon, Bomber Mission Planning Systems, Electronic Systems Command, and Maj Alicia Graham, Joint Mission Planning System architect for their support and knowledge resources provided to me in this endeavor.

I am also indebted to the many B-1, B-2, and B-52 experts who spent valuable time explaining the processes and procedures used for mission planning. Special thanks goes to my classmates from IDE 06J who took time out their schedules to review and provide constructive input to this effort.

Samuel G. White, III

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# **Requirements for Common Bomber Mission Planning Environment**

## **I. Introduction**

In the book “The Clash of Civilizations”, Samuel Huntington espouses that culture will be the primary source of conflict in the post-cold war environment [2]. This theory has striking similarities to the evolution of the long range bomber in modern combat. The cold war culture that has shaped the bomber community has recently clashed with the current environment shaped by the Global War on Terror. The boilerplate for many of today’s weapon systems and associated support systems stem from the cold war environment where a relatively well understood threat dictated our military strategy. This strategy believed war was conceived in three linear, sequential phases which lacked time urgency between them. The first phase consisted of an initial attack by in-place forces in an effort to buy time for follow-on forces. The next phase consisted of a build-up of combat power while performing limited offensive strikes against the adversary. Finally, a decisive ground-centric campaign was launched to defeat the enemy [3:16].

After the fall of the Berlin Wall, the combat environment evolved to one characterized by unprecedented information availability in a highly fluid battlespace filled with adversaries who seek to offset the United States’ technological advantage through asymmetric means [3:16]. This new battlespace consists of fleeting targets which require the capability to rapidly and precisely engage specified targets anywhere in

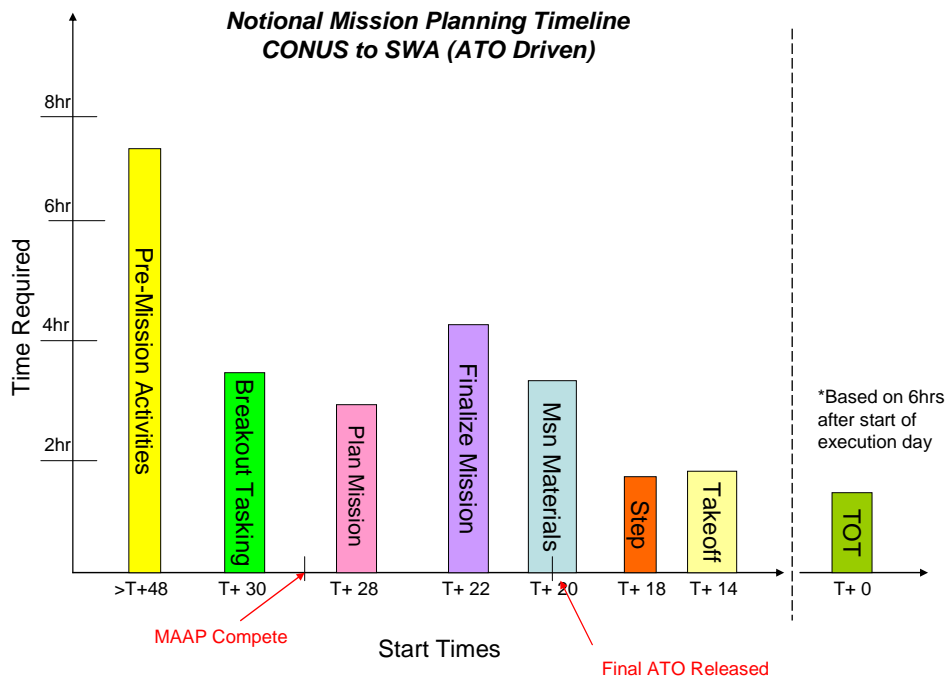
the world, with survivable weapons systems in order to create war-winning effects early in the conflict [4:5]. This capability is enabled through the ability to effectively and efficiently perform mission planning activities at the tactical level. The purpose of the tactical-level Mission Planning Environment (MPE) is to ultimately ensure mission planners receive the right information at the right time and in the proper format to plan and execute missions while reducing risk.

This analysis will serve as an extension of the capabilities specified in the Air Force Mission Support System (AFMSS) Operational Requirements Document (ORD) by decomposing the current unit-level mission planning processes, information exchanges and organizational interactions required to develop long range bomber missions. By capturing this process in a structured architecture, this allows not only for a better understanding of the current unit-level planning process, but also establishes baseline requirements for the bomber MPE. Currently, all bomber MPEs are characterized by numerous man-to-machine interactions, data exchanges, independent systems, and organizational interfaces. There are two primary reasons why this environment exists. First, mission planning systems are directly tied (except for core planning capabilities) to the MWS they support. Though this was bred by the Department of Defense acquisition system prior to the Clinger-Cohen Act, this relationship is still prevalent today [5:3]. This is not optimal because it forces stove-pipe solutions to each systems mission planning challenges and creates competition for funding with other airframe upgrades. Additionally, the mission planning processes at the unit-level are arraigned around existing systems. This system dependent view of the process makes incorporating new capabilities cumbersome because it relies upon the

existing system's capabilities. The focus of this analysis will be on the planning processes which include data and information exchanges between organizational and functional nodes as well as their required interactions. It is crucial that the decomposition of the mission planning activities, data exchanges, and organization node interactions contain sufficient detail in order to adequately describe mission planning environment requirements. These processes will be captured in a capabilities-based (not systems-based) framework so that future planning, programming, requirements and acquisition activities can be accomplished more effectively.

## Background

The purpose of the unit-level MPE is to develop survivable routings that will allow successful engagement of assigned targets to achieve Joint Force Commander (JFC) objectives. There are many challenges associated with developing requirements to accomplish this task. These challenges are a result of the capabilities bomber aircraft bring to the fight as well as changing air-to-ground environment. Although most of these challenges are thoroughly identified in the AFMSS ORD, this research focused on the challenges and requirements specific to the unit-level bomber planning process [6: 16-18]. The Mission Planning Cell (MPC) for long-range bombers represents the center of operations for the MPE. The MPC is comprised of Major Weapon System (MWS) operators, intelligence personnel, Mission Planning System (MPS) operators, and system administrators from the unit-level. Due to the length of time required to complete the planning process, typically eight to twelve hours (see Figure 1), the MWS operators who are part of the MPC usually do not execute the missions they plan. This requires the MPC to develop a plan that can be easily transmitted and understood by the operators who will fly the mission.



**Figure 1, Typical Bomber Mission Planning Timeline**

There are several other challenges that the bomber MPC must deal with in order to successfully complete the planning process. Some of the major capabilities the bomber brings the combatant commander are the ability to employ large payloads of myriad weapons across great distances to engage a variety target sets. These capabilities require enormous amounts of complex mission data and information for the MPC to sift through in order to create executable missions. This drives the need for seamless, joint machine-to-machine integration of all bomber, MPC, and external support systems [8:12]. Additionally, as the speed of the air-to-ground targeting cycle increases and the focus shifts to emerging/fleeting target sets, the MPC will have even less time to perform planning activities. These challenges, inherent to the long range bomber mission and its unique employment capabilities, require consideration when determining MPE

requirements.

The USAF Transformation Flight Plan identifies two emerging capabilities critical for executing precision engagement. They are an order of magnitude increase in the number of targets hit per sortie and achieving specific effects on a target short of total destruction [7:60]. These capabilities translate to munitions with relatively low explosive weight and will result in a significant increase in the carriage capability of long-range bombers. For example, the B-2 can carry up to 80 GBU-38, 500 pound munitions on a single aircraft. Payloads will only increase when munitions such as the Small Diameter Bomb (SDB) become operational. The B-2, for example is set to carry between 64 and 216 SDBs on one mission [9]. This increase correlates to a significant increase in the time required for target area planning. As will be pointed out later in this paper, the current process shows that the local intelligence unit (wing-level) is responsible for checking the location accuracy of each Desired Mean Point of Impact (DMPI) as well as verifying the prescribed weaponeering solution from the tasking organization. This can be a very time consuming process and error prone for large numbers of DMPIs.

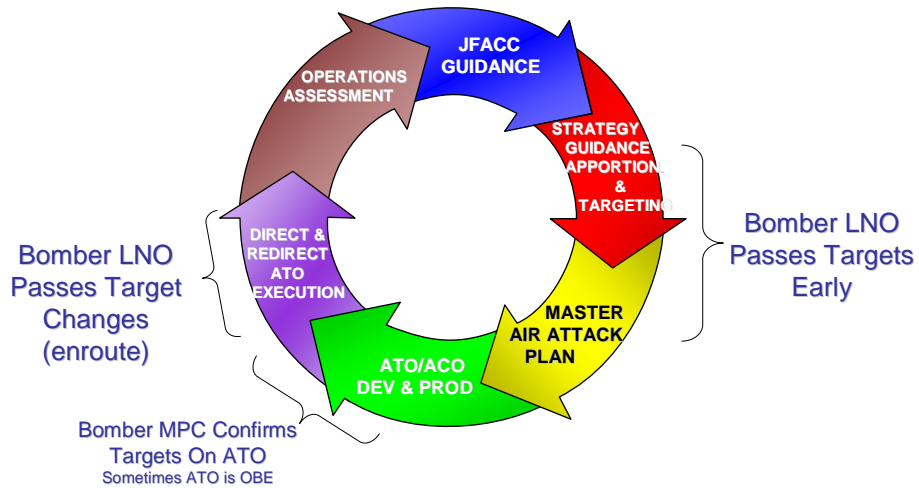
One of the distinctive capabilities of the USAF, which is well suited for bomber aircraft, is the capability to “attack rapidly and persistently with a wide range of munitions anywhere on the globe at any time” [3:79]. Additionally, the Global Strike CONOPS requires the capability to hold high-value targets at risk from the beginning of the conflict [4:10]. This guidance, as well as political considerations and basing requirements, mean bomber platforms require the ability to operate from home station and potentially a long way from the Area of Responsibility (AOR). Even if there is

sufficient time to move forces forward, bombers do not typically deploy directly into the active theater still leaving the Forward Operating Locations (FOL) a significant distance from the AOR. Because of long transit times, the tasking or the enemy Order of Battle (OB) can change several times while enroute to the AOR. In fact, during Operation Iraqi Freedom (OIF), over 90 percent of strike missions received updated target information while enroute [7:67]. Further, the operational plan may not be completed and/or transmitted with sufficient time for the MPC to complete comprehensive planning. Therefore, the unit-level MPC needs to be extremely flexible when developing bomber routing and configuration given that bomber missions can be re-tasked or re-rolled while enroute. Additionally, standard mission products, normally created on the ground, may need to be transmitted to (and printed by) the aircrew while enroute to the AOR. Bandwidth availability and throughput are very important when trying to pass this information to the aircrew particularly when imagery products need to be transmitted.

Since the bomber planning process already lies outside the theater planning process (see figure 2), unit planners typically try to get early information on the tasking. This effectively makes the bomber mission planning timelines longer and lends them to performing several iterations of the same plan.



## JFACC PLANNING CYCLE INTEGRATION



**Figure 2, ATO Cycle**

The MPE requires a robust configuration management process as well as the ability to propagate changes in mission data across the entire MPE or the potential for errors can be high. The basing requirements mentioned earlier normally results in mission planning support functions and agencies not being geographically located with the bomber MPC. This can present not only geographic, but also time zone communications challenges to the planning process.

The highly dynamic nature of the battlespace will require the ability to rapidly detect and assess changing conditions and update en route systems with current information in near real time [4:9]. Furthermore, time required to engage an air-to-ground target has been reduced to minutes because of the fleeting nature of high value targets. The introduction of several in-flight situational awareness tools has enabled the

ability to nearly seamlessly connect sensors, shooters, and command and control assets. Data-link systems such as Link-16 allow the MWS operator to have unprecedented battlefield awareness by receiving real-time data from theater assets. Tactical mission plans require the flexibility to allow aircrew to adaptively incorporate this data during mission execution.

Finally, our current ability to provide the tactical level mission planner timely, relevant, and properly formatted mission information in order to develop and disseminate executable mission plans for a given scenario has also been hampered by the following:

- Inability to seamlessly integrate with operational level joint and USAF C4ISR systems such as TBMCS and GDSS.
- The current MPE requires both Unix-based and PC-based mission planning systems. Neither of these systems independently fulfills mission planning requirements.
- Inability to access and use information already possessed by friendly forces for mission planning.
- Lack of interoperable, adaptable file and data exchange formats or naming convention taxonomy.
- Lack of standard information exchange processes and capabilities.
- Inability to interface consistently with the Global Information Grid (GIG) and other mission networks in order to send and receive critical mission information and updates.
- Lack of a common integrated and robust communications community support mechanisms.

- Existing operational level systems (TBMCS, GCCS, GDSS, etc...) do not easily integrate with tactical level mission planning systems or directly use their source information.
- Several mission planning systems (MPS IV, APS, PFPS, etc) have redundant functionality in the mission planning process and have similar gaps in capability.

## **Problem Statement**

A hindrance of developing an effective mission planning environment is the lack of well-defined requirements. Requirements development is constant, interactive, and iterative process between the stakeholder, the architects, and the developers. A challenge during this process is the inability of the user being able to fully articulate operational requirements in terms that allow the program manager to produce system specifications. Additionally, the user may not fully understand the requirements completely because the project contains new concepts or technology. This research provides a partial solution to this problem by capturing user requirements for the bomber mission planning environment in a technical model. In order to fully capture the MPE requirement, this analysis will:

- Understand how the current bomber MPE for each MWS uses data and information resources.
- Determine how mission planning data is represented and communicated throughout the planning process.
- Determine the information exchange requirements with external entities.
- Provide an application-independent view of mission planning activities, common to all bomber MWS, which can be validated by users and transformed into a physical database design.

## Scope/Assumptions

Although bomber mission planning is not a new concept, capturing the requirements for developing a bomber MPE can be an intensive effort. This research is limited to the tactical-level planning process for strategic bombers in its current (“as-is”) form. It attempts to capture the process requirements in fine detail while other mission planning requirements, such as data and information exchanges will be examined at a more conceptual level. This research draws on material from TBMCS, JMPS, AFMSS and the mission planning processes from all current bomber platforms in order to establish a starting framework for analysis. The analysis is from the viewpoint of the unit-level MPC and its required information exchanges with external organizations. Additional wing functions such as maintenance, leadership, scheduling, and munitions are considered as external agencies relative to the MPC. This research establishes a baseline common planning process which encompasses all bomber platforms realizing that some MWS require different levels of fidelity for the same data.

In performing this research, several assumptions have been made:

- A majority of the information required by bomber mission planners is already collected and created, but not necessarily properly disseminated and/or formatted.
- This concept calls for no other specific Intelligence Surveillance and Reconnaissance (ISR) efforts other than those already in existence or planned for development.

- Planning capabilities are based on tactical mission development requirements and not on any particular mission planning systems.
- Employment effects (precision guided munitions, cruise missiles, etc) are limited to those currently employed by bomber platforms.

Though there are no inherent risks in documenting an “as-is” process, however, gaps in the current process or limitations of current/future mission planning systems may be revealed. The potential consequences are as follows:

- Specific mission planning tools already in development may be delayed or cancelled due to identified MPE capabilities.
- Time and resources may be wasted on mission planning systems that do not supply required capabilities or fit into the overall MPE context.
- Mission planning and information system requirements/priorities may change.
- Major Weapon System (MWS)-specific tactical mission planning processes may require refinement due to uncovered inefficiencies.

## II. Related Research

There have been several efforts trying to define requirements for not only the bomber mission planning environment, but unit-level mission planning requirements across the entire DoD. Most of these efforts were spawned by the desire to consolidate Unix-based and Windows-based mission planning functions into a single system [6:9]. Both the Air Force and the Navy have constructed comprehensive Operational Requirements Documents (ORD) outlining top-level functional requirements for unit-level mission planning. Both documents focus on high-level end-state requirements considered key functionality for the system [6:10]. The next step in the requirements process is for the Major Commands (with input from the unit-level organizations) to define detailed requirements and performance specifications necessary to conduct tactical mission planning [6:10]. For the bomber community, each MWS has developed an Operational Concept of Employment (OCE) for their particular MPE. The OCE describe, in varying levels of detail, the mission planning process, data, security, training, and administration requirements for the MWS-specific MPE from the perspective of the mission planning cell. These requirements are represented through textual descriptions making it difficult to visualize process flow, information exchanges and organizational relationships. So far, the best representation of the unit-level mission planning process is the Joint Mission Planning System, Command, Control, Communication, Computers, and Intelligence Support Plan (JMPS C4ISP). In response to the USAF, Army, SOF and Navy ORD, the JMPS C4ISP product analyzes tactical mission planning processes across

all services as well as special operations through functional decomposition/definition and several DoD Architecture Framework (DoDAF) views. Because the scope of JMPS covers the air asset mission planning processes across the entire DoD, it is more of a top-level requirements document which needs further refinement by users at the unit-level. JMPS has baselined many of its architecture products from the AFMSS architecture model. Many of the inefficiencies and capability gaps that exist in AFMSS are now apparent in JMPS. The requirements analysis section (chapter 4.3) below will highlight some of these areas. Both the JMPS and AFMSS architectures are based upon detailed system capabilities provided by their respective systems. These documents outline the planning requirements as they relate to running a particular system, not a framework required to perform unit-level mission planning activities. The previous efforts proved extremely beneficial as a basis of comparison. This research represents the layer consisting of detailed unit-level mission planning requirements called for in the AFMSS ORD.



### **III. Methodology**

A structured architecture was chosen as a basis for analysis because of its ability to show activity and node relationships and responsibilities. An object oriented approach was also considered, but did not seem to capture the planning activities and information flows as well as the structured approach. This architecture includes the operational views required to adequately capture the activities, data, and information exchanges of the bomber mission planning process. Capturing this process in an architecture structure will provide acquisition and operations personnel better insight on the requirements of future mission planning tools as well as ensuring those tools support the required activities and data flows. DoDAF Vol. 1 defines enterprise architectures as “the explicit description and documentation of the current and desired relationships among business and management processes and information technology” [14:2-1]. It continues “as (the) DoD enters into an era of Net-Centric Operations and Warfare, the ability to portray and understand complex many-to-many relationships becomes even more important.” Capabilities must be able to “plug and play” in a Joint, global, multimedia, and multilingual environment. To achieve this ability, there must be a mechanism for incorporating information technology (IT) consistently, controlling the configuration of technical parts, ensuring compliance with technical “building codes,” and ensuring efficient processes. Architectures provide this mechanism by serving as a means for understanding and managing complexity [14:3-1].

If we view warfare as an enterprise, it would consist of three levels: strategic, operational, and tactical. Hierarchical ties need to exist between all levels when developing mission planning architectures. “Architecture is the fundamental organization of a system embodied in its components, their relationships to each other, and to the environment, and the principles guiding its design and evolution” [14:1-1].

Fundamentally, the tactical-level MPE is simply an extension of the operational-level capabilities charged with accomplishing detailed activities. This means the guiding rules, components, relationships at the operational level shapes those same entities at the tactical level.

## IV. Architecture

### Overview

The primary references for the architecture products were the MWS OCE. The mission planning processes and information requirements were extracted from each MWS OCE to create a common OCE. This common OCE served as the framework for determining the operational activities as well as the information exchange requirements for the structured architecture models. The architecture products were created in accordance with the DoDAF guidance. Additionally, the architectures from both JMPS and AFMSS were used as a basis of comparison for each of the created views. Four Operational Views (OVs) were chosen to model bomber mission planning process: OV-2, OV-3, OV-5, and OV-6c. Operational views were chosen to model mission planning requirements because they identify what needs to be done and who is supposed to do it [15:2-1]. Specifically, the OV describes the tasks, operational nodes, and information exchanges required to accomplish the intended mission. The four views shown in this research represent the best models for the tactical mission planning process (see Table 1).

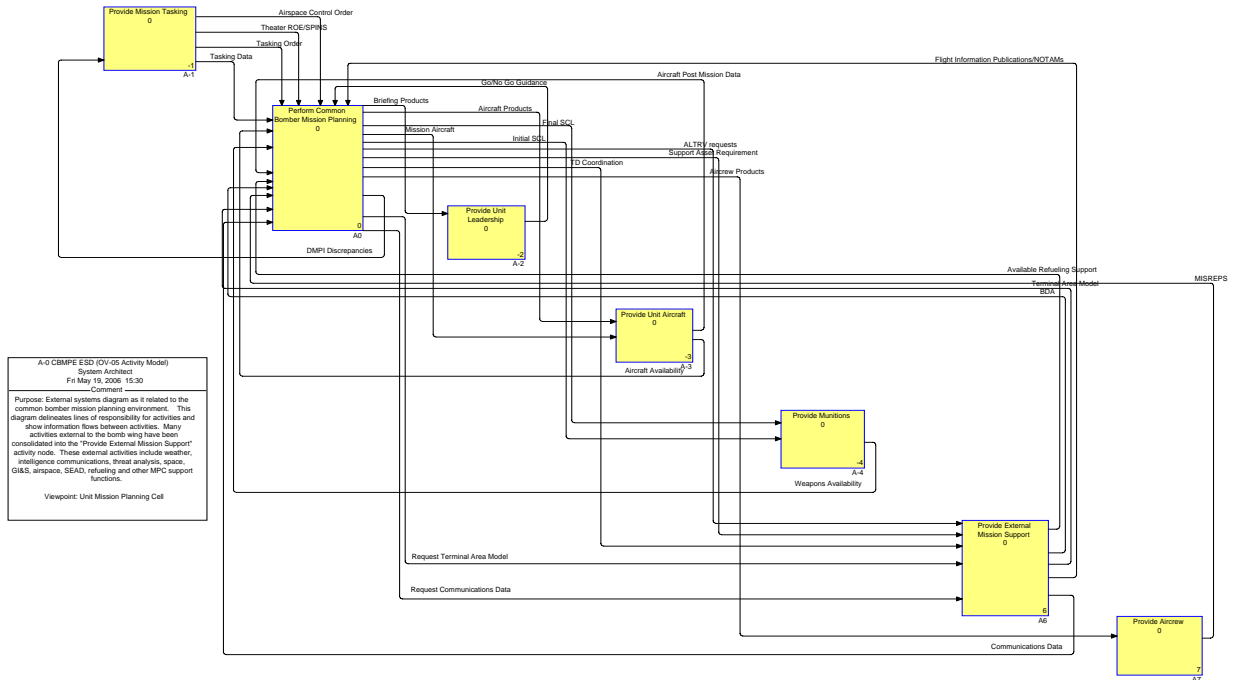
**Table 1, Selected Operational Views (DoDAF, Vol II, pg. 2-4)**

Framework Product	Product Name	General Description
OV-2	Operational Node Connectivity Description	Depicts operational nodes, connectivity, and information exchange needlines between nodes

OV-3	Operational Information Exchange Matrix	Describes information exchanged between nodes and the relevant attributes of that exchange
OV-5	Operational Activity Model	Describes capabilities, operational activities, relationships among activities, inputs, and outputs
OV-6c	Operational Event Trace Description	Used to describe operational activity; traces actions in a scenario or sequence of events

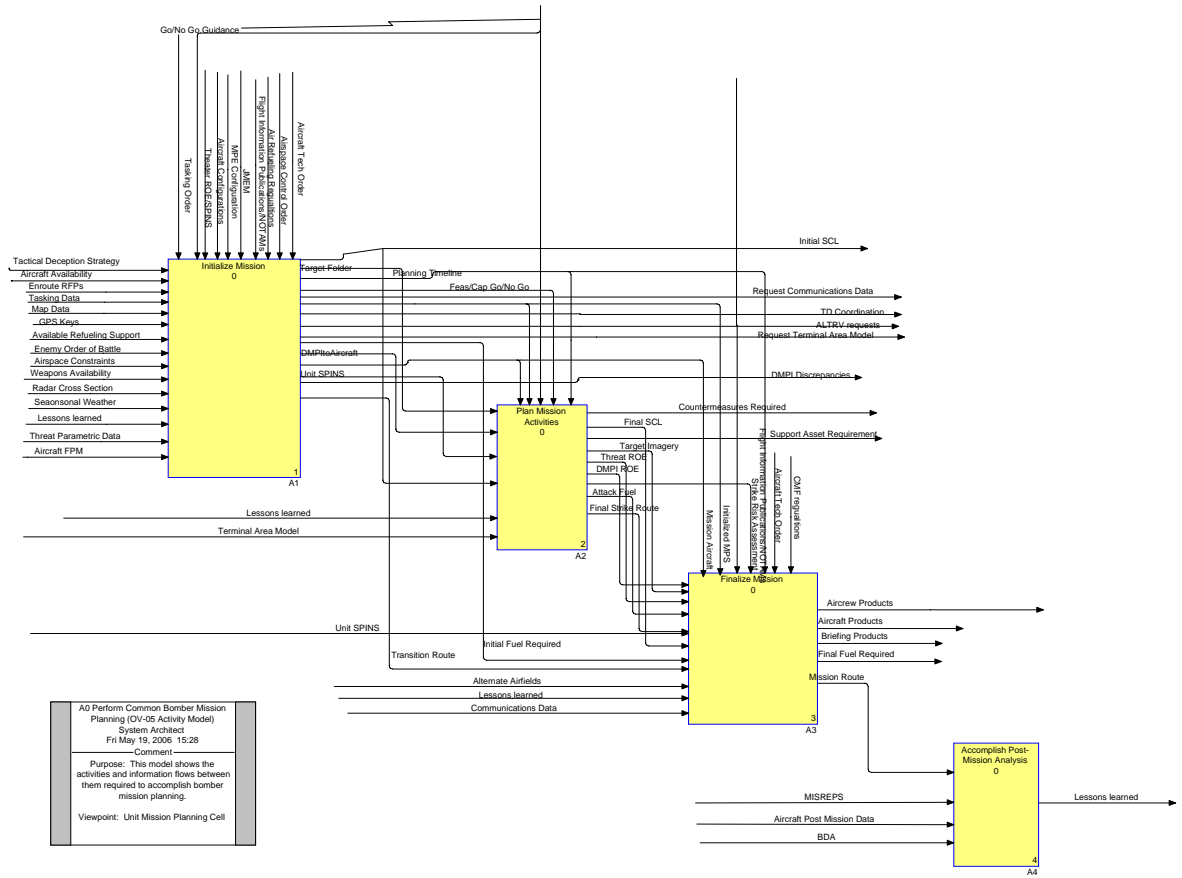
### ***Products Descriptions***

The first product developed was the OV-5 activity model. Since this product was from the viewpoint of the unit mission planning cell, other wing activities such as providing aircraft, aircrew, and weapons were considered external to the planning activity (see Figure 3). Additionally, most other external stakeholders except the tasking organization were lumped under one activity defined as “Provide External Support”. Examples of these activities include providing weather, refueling, and suppression of enemy air defenses. Typically, the OV-5 would be generated after an operational concept (CONOP) or an OV-1 (High Level Operational Concept graphic) has been determined. For tactical mission planning, this concept is well documented. These functions are broken out as operational nodes in the OV-2.



**Figure 3, Common Bomber MPE External Systems Diagram (OV-5)**

The first level functional decomposition of the “Perform Common Bomber Mission Planning Activity” resulted in four major activities (see figure 4). These activities are initialize mission, plan mission activities, finalize mission, and perform post mission analysis. The names of these activities were kept consistent with the terminology as used in the MWS OCE as much as possible. The “Initialize Mission” activity is divided into four separate tasks which begin when the operational unit gets notified of an imminent tasking. The lower level activities that comprise this process are; initialize the Mission Planning Environment (MPE), accomplish pre-planning tasks, break out tasking data, and analyze mission feasibility.



**Figure 4, A0 - Perform Common Bomber Mission Planning (OV-5)**

The goal of decomposition is to break down complex activities into its simplest tasks with the corresponding inputs, outputs, and controls. Mechanisms were intentionally left out as to not suggest any material or organizational solutions. The functional decomposition for this analysis includes one or two lower activity levels below the A0 level. An interesting observation from the activity model was the amount of feedback present. Several activity outputs were fed back into the same functional level and sometimes up to the level above. A functional flow block diagram may allow better insight into the sequencing of activities and the effects of feedback.

The next model created was the OV-2 node connectivity description (see Figure 5). This view breaks out the entity known as *Provide External Mission Support* into operational nodes. It also depicts the information needlines between those nodes and the mission planning cell. Again, the viewpoint for this model is that of the mission planning cell. When this model was compared to the OV-2 for JMPS and AFMSS, some interesting differences were discovered.

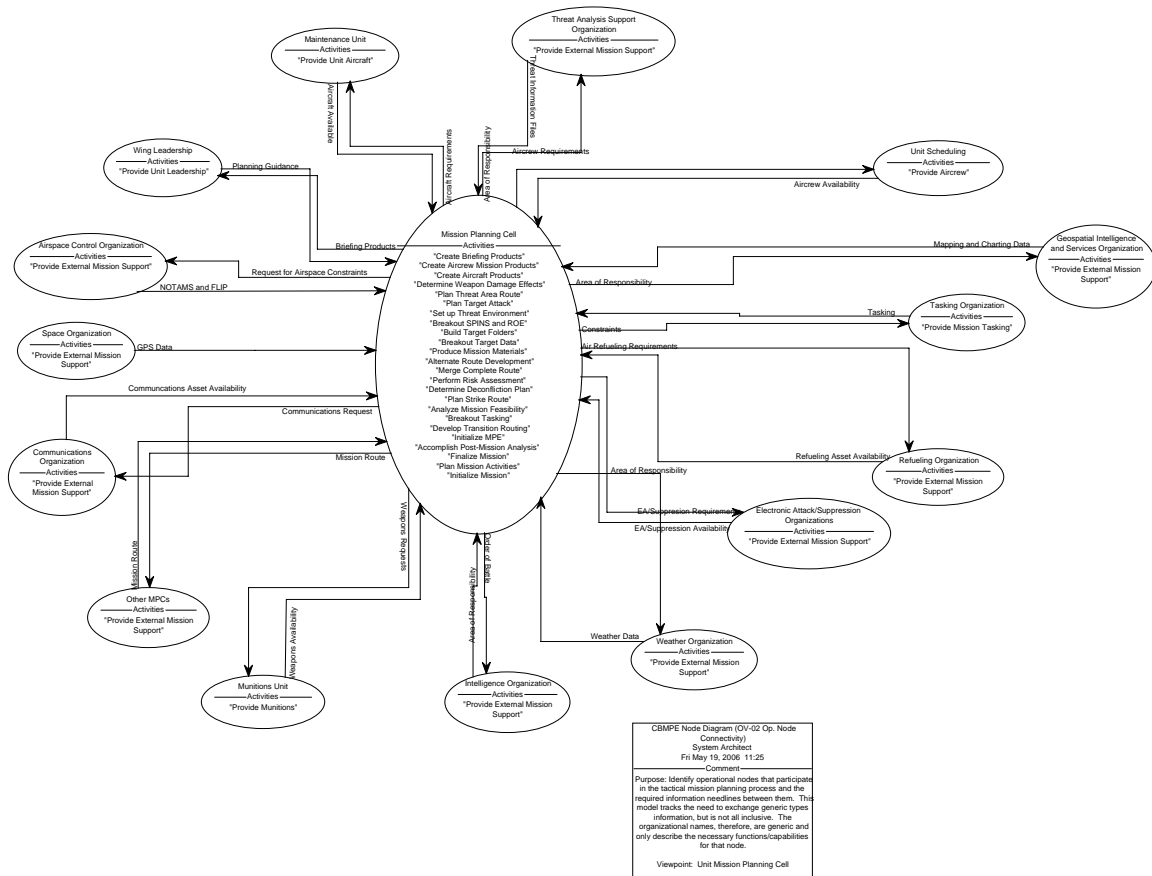


Figure 5, Operational Node Connectivity Diagram (OV-2)

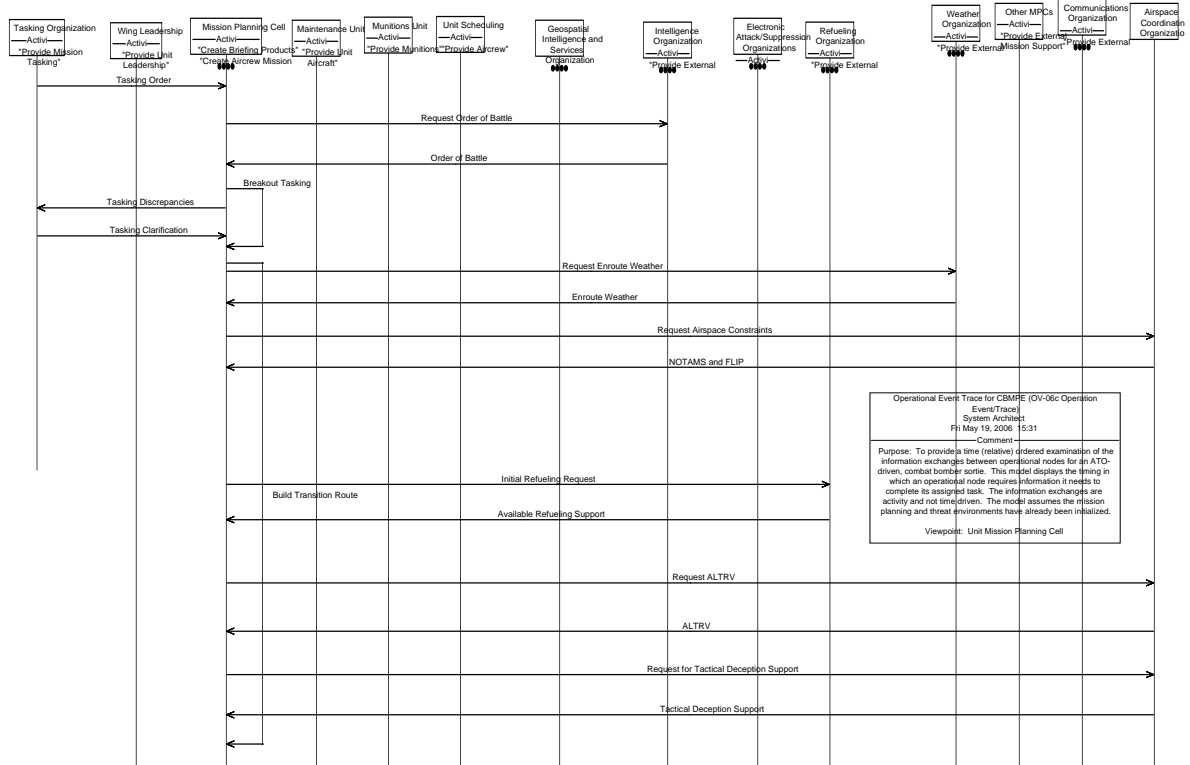
First, Air Force Space Command (AFSC) was depicted as an operational node in both the JMPS and AFMSS architectures [13:3-40]. The information elements riding the needline between AFSC and the MPC contain GPS almanac data. None of the MWS OCE mentioned a requirement for GPS almanac data to perform tactical mission planning. The only GPS requirement mentioned by the MWS OCE was GPS keys which come from the NSA [10:46, 11:10]. Next, USSTRATCOM had an operational node and needline to the MPC in both architectures, duplicating many of the information elements of existing needlines [13:3-40]. Finally, in examining the MWS OCE, at least two external organizations which provide mission information to the MPC were not listed on the OV-2. These organizations include Det. 1 608<sup>th</sup> Combat Planning Squadron at STRATCOM which provides nuclear planning data and creates CALCM routes [12:15] and the 10th Intelligence Squadron which provide the terminal area models for the Joint Air to Surface Standoff Missile (JASSM)<sup>11</sup>. The merits of outsourcing critical mission planning tasks to external agencies are arguable; however, the bigger issue may be the need for a collaborative environment between these type organizations and the MPC.

The next view created was the OV-6C Operational Event Trace diagram (see Figure 6). The purpose of this view is to depict a time ordered sequence of how information is exchanged between operational nodes when stepping through a given scenario. Again, some interesting observations were revealed in comparison with the JMPS and AFMSS OV-6c [13:3-59].

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<sup>1</sup> The MPC currently has limited capability to create JASSM TAM. The B-1 MPC plans to have the MPC create the majority of operational TAM in the future [10].





**Figure 6, Operational Event Trace Diagram (OV-6C)**

The results of this analysis found that the information exchanges were event driven and not time driven. This is interesting because this makes the requirements for information exchange timing much more vague and difficult to create a specification. But the analysis found this is how data and information are driven in reality. In the MPC, the only time that matters is the Time on Target (TOT). Every other control time and action point is based upon that time. The bad assumption implied here is that the MPC will always have the same amount of planning time no matter what mission type, complexity, duration, etc

The last view created was the OV-3; Information Exchange requirements description (see Appendix A). The purpose of this view is to describe the data elements (through attributes) that ride the needlines between operational nodes. Trying to assign requirements to data attributes such as criticality, timeliness, and security is difficult because often these attributes vary depending on the situation. Because of this variability, mission data will probably need to be tagged such that activities would know how to handle that data depending on the situation. Of note, this analysis defined 12 more information elements than the AFMSS/JMPS architecture [13:3-42 – 3-51]. This difference was primarily a result of how the needlines in the OV-2 were defined.

## V. Analysis and Observations

The basic intent of this research is to establish a requirements baseline by identifying the business processes and data/information exchanges to accomplish bomber mission planning at the unit-level. During the research process, several observations were made in regards to the architecture, the planning process, and net-centric operations.

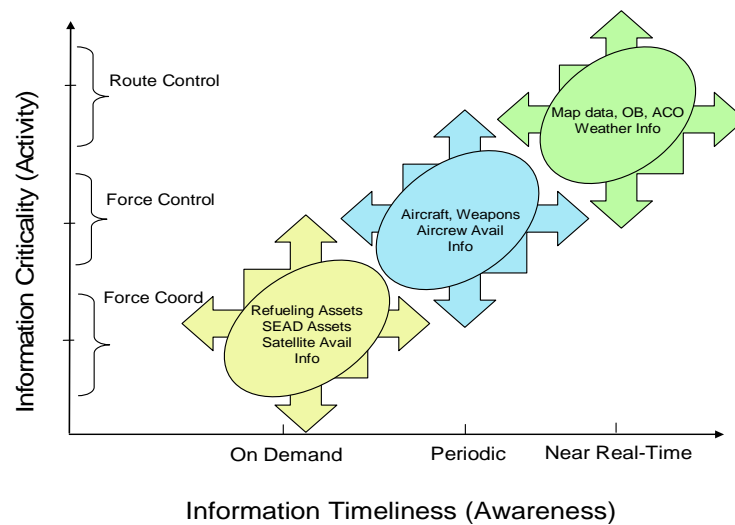
### ***Observation 1: Strategic bombers can share a common MPE***

Although each bomber MWS has unique capabilities, the planning process is essentially identical and requires the same information exchanges. Differences lie in the fidelity or granularity of the data types. For example, each bomber MWS utilizes threat data files created by the 36<sup>th</sup> Electronic Warfare Squadron to operate their respective defensive management and electronic counter-measures systems. These threat data files are tailored to meet the unique needs of each MWS. They also utilize the same threat parametric data created by the Air Force Intelligence Agency (AIA) though different platforms may be concerned with unique aspects of that data (i.e. radar cross section data for the B-2).

### ***Observation 2: Information exchanges require more study***

The motivating factor for information exchanges between operational nodes is based primarily on the activities using the information. More specifically the information exchange is activity-driven and not driven by a pre-established, static timeline (as shown in the AFMSS ORD and the JMPS OV-3). In mission planning, the only “static” time

that matters is time-over-target/objective. The activity flow to achieve that objective time can expand and contract based upon the fluidity of the planning environment. Timeliness of data required by the mission planning process is related to a number of factors to include criticality, interoperability, as well as the consuming activity. In net-centric warfare this concept is called variable quality of service [1:189].



**Figure 7, Variable Attributes of Information Elements for Bomber Mission Planning**

The interrelation of these data attributes implies they can change over their lifespan (see Figure 7). Not only should the data be tagged such that activities know its handling requirements, the activities also need to know how data attributes such as criticality, timeliness, security level, and life expectancy vary according to the situation.

Additionally, the activities need the ability to retag data according to the situation as well as the conditions that this would occur. Given this argument, data and information should be divided into three latency categories: real-time, periodic, and response-based (see Appendix B, OV-3 diagram for descriptions). Varying latency values are chosen to prevent potential information overload from data that is constantly changing and is always available. Exceptions to data falling into these categories occur when criticality supersedes predetermined timeliness. As an example, there are only certain instances when the unit-level mission planning cell needs to know aircraft status. This information needs to be known when the tasking is received and shortly after the aircraft returns from executing the mission. Changes to this status in the interim may or may not require real-time updates depending on the situation. If the aircraft has mission essential equipment that has failed during preparation, this may not be an issue if parts and expertise are on hand to fix it and/or there is a mission capable spare available. Deciding on data format and attribute strategies as well as what type of data bases (relational vs. hierarchical) are appropriate for storage and transfer of mission data, are areas that require further study.

***Observation 3: Need a vehicle for feedback to ensure process improvement***

Feedback from execution about the battlespace is a very important aspect of bomber mission planning that should be captured in the process. Intelligence Mission Reports (MISREPs) from the aircrew, Bomb Damage Assessments (BDA), and feedback on the quality of mission materials are essential for the MPC to constantly improve. Although the human element of capturing lessons learned is essential, the MPE should also facilitate feedback and automatically adjust processes, procedures, or future plans accordingly. This can be in the form of downloading mission data such as threats

detected, weapon post-release information, radar imagery or capturing voice/data transmissions. This information can be vital in recreating the execution picture so that it can be compared with the initial mission information and tactical plan. In addition, this information can be fed back to the operational level planners to be used for their lessons learned and as insight for follow-on missions.

***Observation 4: Need to view route development from formation perspective***

Planning orders typically task units with a specified number of DMPIs to cover, the desired effects on those DMPI, and the number assets required to achieve that tasking. It is up to the MPC to determine how the formation or package of assets will effectively and efficiently prosecute the task. Given this scenario, bomber route development must be viewed from the package/formation perspective and not as an endeavor in producing several individual routes. Bomber strike routes are developed based upon mutual support with other strike routes in the formation/package such that the mission objectives are achieved. The MPE should enable the MPC to analyze the attack plan from perspective of the formation/package. The MPE should also automatically allocate DMPIs to formation aircraft based upon MPC defined constraints (i.e. maximum number of weapons for one pass, multiple axis of attack, etc) and allow the MPC to easily pass target objectives between aircraft such that an optimal attack solution can quickly be reached.

***Observation 5: Need robust IADS model that accounting for support effects***

Since long range bombers are typically tasked with striking targets which are heavily defended, assessing route survivability is critical when developing a Suppression of Enemy Air Defenses (SEAD) plan. Properly evaluating the enemy threat is dependent

on the fidelity the Integrated Air Defenses (IADS) model within the MPS. Factors such as early warning cueing, robustness of command and control networks, engagement doctrine, and operator proficiency are vital to effectively modeling the enemy kill chain. It is also important to model the effectiveness of denying enemy anti-access systems such that an accurate risk assessment can be made. This includes the ability to predict the impact of ground-based effects from non-traditional electronic warfare sources. “Low-observability and maneuverability alone will not guarantee survival against advanced air defenses.” Computer network attack methods and electronic warfare will be used to blind sensors, interrupt communications, disrupt command & control and enable strike assets to ingress, survive, attack and depart. “Use of these methods in conjunction with destructive measures (or as destructive measures themselves) will have permanent effects on the function of enemy air defenses” [4:9]. Accurate modeling of the enemy anti-access kill chain with mitigating effects is imperative when determining overall mission survivability.

***Observation 6: Redundant tasks between operational and tactical planning cells***

Potential redundancies reside in the current bomber planning process. For example, weaponeering solutions and target determination activities are performed at the operational as well as the tactical level. The Joint Air Operations Center (JAOC) develops and weaponeers targets in support of tasking order objectives as part of the Master Air Attack Planning process (MAAP) [17: Chap IV]. After the tasking receipt, which includes targets and associated weaponeering solution, the MPC verifies the target locations and checks the accuracy of the JAOC provided weaponeering solution [11:12]. This is accomplished because targeting errors made by the operational planning team

could potentially cause unintended collateral damage or strike unintended targets. Verifying target location and weaponeering solutions can be very time consuming and will be even more so when smaller, low collateral damage munitions, such as the SDB, become more prevalent. Rechecking the work of the JAOC may not necessary if there is automatic assurance of quality data in information exchanges. The key is to the ensure quality data created by the JAOC is passed between the operational and tactical levels so the MPC can concentrate on making the plan and adjusting to changes to the tasking. One way to address this issue is by creating a shared planning environment in which the MPC has visibility on and can provide input to the MAAP process. Conversely, JAOC planners will also have visibility on unit-level resources as well as their support requirements. With a shared MPE, all planning levels have a better understanding on the motherhood of planning data and information thus giving confidence in the final solution. Another possible solution would be to simply delegate the weaponeering functions completely to the unit-level with the operational level planners being responsible for only specifying the damage/effects requirements. This allows the unit flexibility in choosing the appropriate weapon load and/or tactics based upon available resources. However, these solutions are still redundant because the JAOC still has to decide what platform to use, based upon its capabilities, in order to ensure the desired target effects are achieved at the operational level.

***Observation 7: Operational and tactical MPE should have hierarchical relationship***

In keeping with the shared planning environment theme, differences in tasking authority don't and shouldn't change the bomber planning process. Whether the MPC is planning a mission in support of USCENTCOM or USSTRATCOM, the activities and



mission information required to plan and execute the mission are the same. Each operational level planning organization should either have a shared MPE with the tactical level planners or have completely interoperable systems. This reiterates the point that the MPC should spend its time developing the mission, not verifying or converting the work done by the operational level. For the nuclear mission, USSTRATCOM accomplishes most of the tactical mission planning activities (develops the routing, targeting plan, etc) to ensure deconfliction between many different MWS. Even for this scenario, the MPE it uses should have a hierarchical relationship with the unit-level just as it should for conventional weapon scenarios. In other words, the unit-level MPE should be an extension of the operational MPE and should not use a unique planning system to produce a bomber mission route.

***Observation 8: Need virtual collaboration between operational and tactical planners***

A challenge identified earlier in this paper to bomber mission planning was the distributive nature of the MPE due to the large geographic distances between source mission information and the MPC. Given this challenge, the focus should again be on creating a common planning environment starting at the operational level. Shared awareness beginning at the operational level and empowered by virtual collaboration tools will enable the formation of effective self-organizing teams at the tactical level. Collaboration should extend beyond messaging and chat services and include file and application sharing. This type of planning environment will allow planning times to be drastically reduced and increase the quality of the information exchanges at all levels. Additionally, organizations outside of the MPC that perform critical planning activities (i.e. cruise missile routing, terminal area models, etc.) will no longer represent an

inefficiency in the process. A common planning environment coupled with virtual collaborative tools will ensure timeliness of planning data, adequate deconfliction, and consistency within the planning effort.

***Observation 9: Tactical deception needs to be part of the mission planning process***

The age of the 24 hour news cycle has created an environment where information moves rapidly and can be readily accessed by almost anyone, almost anywhere. Even robust OPSEC plans can have trouble concealing mission details in the current setting. Particularly in GSTF scenarios where it is likely that bomber missions will depart from and return to the CONUS. Tactical planning needs to include provisions for adapting to the abundance of information and political uncertainty through the use of active measures such as tactical deception (TD) plans. Mission information such as basing, signature protection, airspace, and operations tempo can reveal critical aspects of the mission, degrading even the best planned mission. The key to a solid tactical deception plan is close coordination with the U.S. State Department and other foreign or domestic government agencies. This requires the unit level MPC to have secure, temporary information exchanges with these non-traditional planning organizations in order to enable these plans. It is important the TD plan doesn't conflict with the mission plan so that non-participating organizations don't become confused with actual mission details. Unlike conventional planning operations, TD plans cannot be rehearsed or it risks losing the key element of deception: surprise. Therefore the roles and responsibilities of participating organizations must be well understood through sound planning. Additionally, feedback mechanisms are required to evaluate the effectiveness of the TD plan.

***Observation 10: Reduce man-to-machine interfaces for data transfer***

The OV of the bomber MPE has shown that the planning process includes a large number of information exchanges, data elements whose attributes vary depending on the situation, and activities that iterate and feedback mission information between themselves. Because of the data intensive nature of this process, man-to-machine interfaces for inputting, formatting, and communication of data should be avoided. These type interactions between multiple independent systems in the MPE as well as the operational and tactical planning levels are inefficient and error-prone. The crux of the issue in the bomber community's use of both Unix-based and PC based MPS to conduct mission planning activities. There are, however, other mission planning tasks that have excessive man-machine interaction for data transfer. As an example, currently in the B-1 and B-2 MPEs, the MPC currently receive the Order of Battle (OB) data from various Intelligence sources like the Air Intelligence Agency (AIA) via fax, phone, or message traffic. Threats and OB data are typed into a PC program called Order of Battle Management Tool (OBMT). The finished file is then converted to a "strati.rcv" file and transferred to a floppy disk for transfer to the MPS machines. The ".rcv" files are transferred to the MPS machines where the OB data can be displayed and utilized [10:10]. As is systemic in many mission planning system shortfalls, the unit or Major Command (MAJCOM) is forced to develop an interim capability to make the process more effective or to cover capability gaps of the current mission planning systems. In this case, Air Combat Command developed Personal Computer Integrated Imagery and Intelligence (PC-I3), as temporary fix to provide the desired capability. Even PC-I3 isn't a silver bullet solution. MPC personnel still need to be actively involved in ensuring the

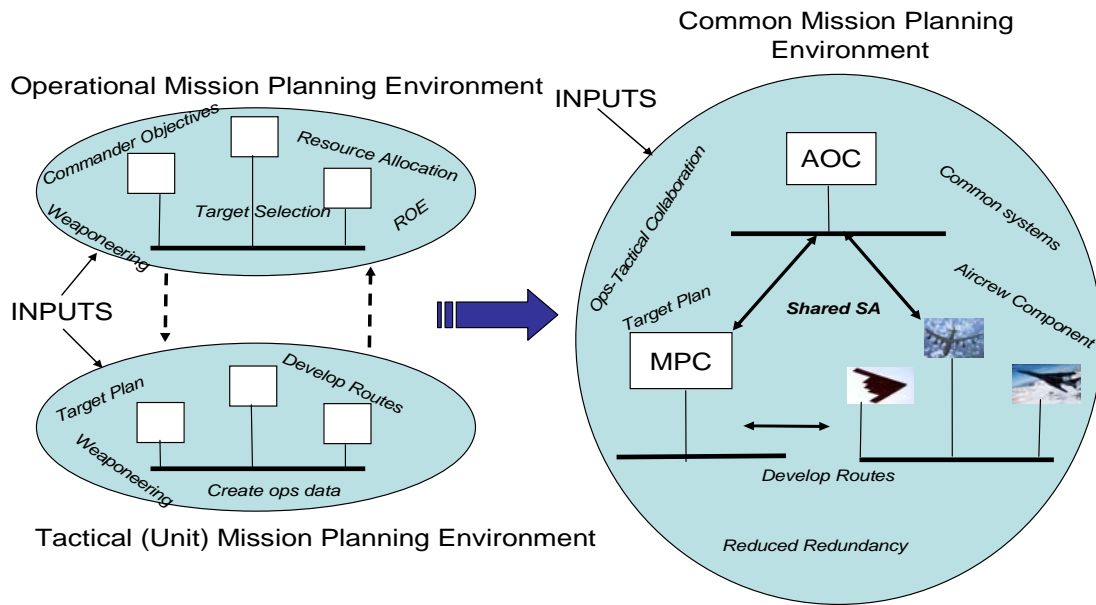
correct data goes to the right MPE for the correct mission and the data is not inadvertently overwritten [10:11]. Process focused, machine-to-machine interchanges are needed to maximize efficiency for planning processes. Additionally, forcing units and MAJCOMs develop temporary fixes to provide necessary mission planning capabilities is inefficient and wastes money on soon to be obsolete systems.

***Observation 11: Need information infrastructure to promote “net-centricity”***

The B-52 OCE makes some interesting statements concerning interoperability of the MPE with external organizations. First, it states that “Because there are no inherent networking capabilities/hardware provided with the MPE, system networking for the MPE is the unit’s responsibility” [12:21]. On the other hand, it states that interoperability is independent of the site or base [12:21]. When we think of net-centric operations, things like networking to external operational are crucial to enabling the required information exchanges of the MPE. Recall that the point of “net-centricity” is to ensure the tactical level mission planner receives the right information, in the correct format, at the right time. “The entry fee for Net-Centric Warfare is an infostructure that provides all elements of the war-fighting enterprise with access to high quality information services. In order to accomplish this, we must take a systems view of the process to include the operational and tactical level of planning as well as the interfaces between them”[1:187]. The enterprise is responsible for developing the open architecture and business rules for participation. Passing the interface responsibility of Global Information Grid connectivity to the unit forces is inefficient and results in stove-piped, system specific solutions to interoperability (i.e. Combat Track II and High Performance Waveform).

***Observation 12: The aircrew should become part of the MPE***

Earlier in this paper, one of the several challenges to the bomber mission planning process was the long planning timeline. An unfortunate consequence of being ahead of the operational planning process is the high probability that the plan will change. This environment creates the unexpected consequence of making mistakes do to multiple changes, iterations or versions of the same plan. As mentioned earlier, one of the characteristics of the information age is the speed and availability of information. The present day battlefield largely consists of fleeting targets protected by fluid defense networks. When employing long range strike platforms, these characteristics need to be taken advantage of in order to make employment decisions with the freshest information from the originating sources. A step toward achieving this has already been taken in the form of Airborne Mission Transfer (AMT) and the Inflight Replanning Tool (IFR). However, in order to be truly effective and efficient, a step further should be taken by including the aircrew as part of the MPE during execution (see Figure 8). Doing this is fundamentally different from the thought that mission planning is primarily a ground-based activity; too complex to be accomplished effectively in the air. There are schools of thought that feel getting the crew a detailed plan, even if that plan has a high potential of being inaccurate, is better than no plan at all. Due to the current environment, this theory is flawed.



**Figure 8, Migration to Collaborative Mission Planning Environment**

Putting potential misinformation in the hands of the crew only serves as chaff; distracting them from the truly essential mission information. The real question the MPC must ask is “what is the essential information the crew needs to get them out of the door so they can be viable to the JFACC?” Is it routing to/from the AOR, enroute weather, fuel requirements, communications plan, or weapons load? That seems to leave out the most important parts of any bomber mission; target, threats, and tactics. These just happen to be the same parts that are the most fluid in a combat environment. It would seem the optimum mission plan would be one that allows the aircrew the most flexibility as well as wide range of options in the AOR. This is contrary to the thought that most planning should be done at ground speed zero by the MPC. In his book “Blink”, Malcolm

Gladwell defines two types of decision making methods; naturalistic and rational. He states that naturalistic methods are best suited to situations of greater time pressure, where the decision maker is more experienced, where the situation is dynamic, and where goals are ill-defined [18:51]. Applied to bomber mission planning, this method would seem best suited for the MPC. Conversely, he says that “rational choice strategies are better suited to situations where the selection of COA must be justified; where conflict of opinion within decision-making teams must be resolved; where the best possible solution must be obtained; where time is not at a premium; and where greater computational complexity is required or (perhaps) is simply available” [18:52]. This type of decision making is best suited for the environment where the best information is available; airborne in the theater. He goes on to say that “there is some evidence that in tactical decision making the best possible solution is not necessarily the most desirable: the ‘80% solution now’ may well be more effective than the best possible solution obtained some time later” [18:52]. For bomber planning, it may be better to get an aircraft enroute to a potentially fleeting target, than to figure out all the details first.

There are several obstacles to making the “airborne MPC” a reality. First and probably most important is training. Using rational mission planning methods will require non-traditional thinking and the development of different skill sets at the aircrew level. The focus will be toward decision making instead of employment mechanics. Training scenarios will entail tactical employment in very unpredictable environments just like the combat environment. In order to form an MPC mentality in the aircrew, they must be exposed to scenarios which require them to adaptively create tactical plans. This includes being familiar with the activities, required information elements, and

information exchanges normally accomplished by the MPC. An obvious limitation to this approach is the lack of high fidelity on board planning tools which accomplish the same functions as the ground-based MPS. Functions such as auto-routing, weaponing, and route deconfliction must be available to the aircrew in order for this concept to work effectively. Since this type of approach would be very costly, other methods could be employed to allow for adaptive planning. For example, before football teams play a game, the offense studies the film of the opposing defense in game situations. They then structure practices to see how their capabilities compare with the opponents and determine play options based upon different defensive schemes. On game day, the quarterback analyzes the defense and calls an “audible” if necessary. The same type of thinking can be applied to bomber operations. After gaining an understanding of the enemy’s defensive system and doctrine for employment, planners can match offensive capabilities against various vulnerabilities in the defense. Additionally, they can determine alternate game plans (“audibles”) based upon potential variations in the enemies defense or changes in target location. The bottom line is the aircrew needs the ability to effectively adjust the plan of attack based upon the environment at the time of execution.

The final piece required to enable an airborne MPC is flattened command and control. One of the enabling characteristics of network centric warfare is self-synchronization. The ability for bomber aircrew to adaptively mission plan requires this self-synchronization characteristic to be effective. Self-synchronization consists of a shared awareness and value interaction between entities as well as a rule set which describes the desired outcome in various operational situations [1:175]. “The



combination of a rule set and a shared awareness enables the entities to operate in the absence of traditional hierarchical mechanisms for command and control” [1:175]. The concept of self-synchronization is not new to military operations. This type of behavior is prevalent in lower level ground engagements as well as air-to-air engagements. The nature and speed of these type operations drive the necessity for a flattened command and control structure and decentralized execution. A common thread between these operations is the presence of clear commander objectives and well understood rules of engagement. Air-to-ground employment operations have not fully enjoyed this type of structure for at least two reasons. First, the speed of the air-to-ground environment (except for close air support) has been slow relative to ground-only and air-only tactical engagements. As noted earlier, the tactical target planning cycle normally takes 72 hours from start to finish. Ground engagements are obviously planned in advanced, but because of the fluidity of the environment, do not require the level of detail employed by air planners. Second, the availability of information at all levels has given commanders and planners unprecedented access to battlefield information as well as directly to tactical platforms. This access can tempt commanders into making tactical level decisions instead of the troops in the field.

## **VI. Recommendations/Conclusions**

This analysis serves as a starting point for baseline requirements of a common bomber mission planning environment. These requirements were defined through the analysis of activities, mission data, and information exchanges necessary for the tactical mission planning process. As a result of this analysis, several observations were made relevant to potential improvements to and recommendations for the common bomber MPE. The underlying theme for many of these observations is the need for a shared planning environment between the operational and tactical level as well between tactical planning functions. This environment should be enabled by collaboration tools and allow for the dynamic incorporation of lessons learned. Due to the complexity of mission data and number of information exchanges, this environment should also maximize the use of machine-to-machine interfaces for data input, format, and communication. Finally, the growing fluid nature of the air-to-ground employment environment has driven the need to include the aircrew as part of tactical mission planning. This inclusion ensures that the right people get current information, at the right place and at the right time. BOTOT!

## Appendix A. Integrated Data Dictionary (AV-2)

### Contents

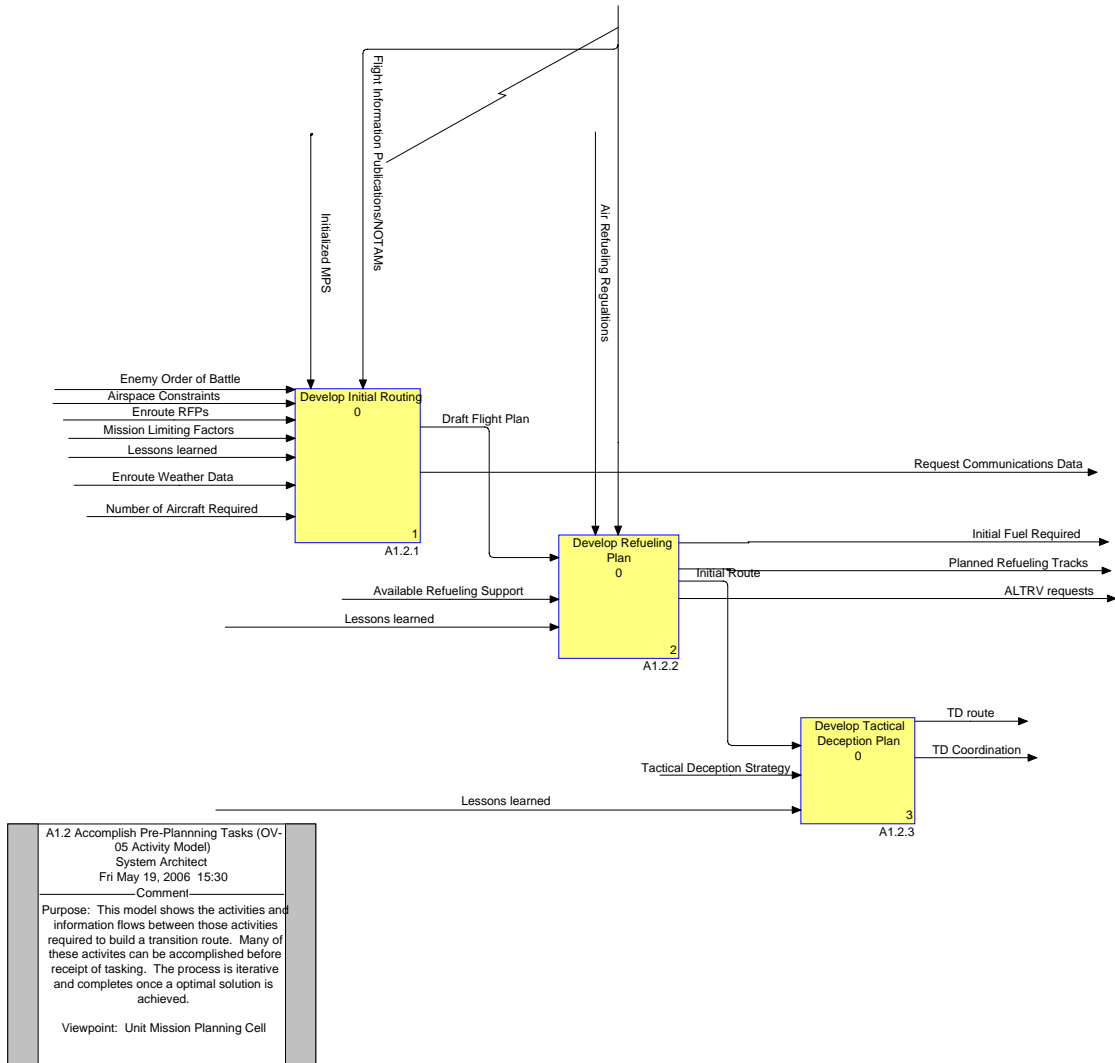
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## **Accomplish Post-Mission Analysis**

**Diagram Properties for: Accomplish Post-Mission Analysis**  
**Audit ID: afit**

# Accomplish Pre-Planning Tasks



**Diagram Properties for: Accomplish Pre-Planning Tasks**  
Audit ID: afit

## Operational Activity: Develop Initial Routing

**Glossary Text:** Takes in airspace restrictions, enroute radar fix points, enemy order of battle, NOTAMS, and other limiting factors and creates a round trip theater flight plan. Determines strike route entry and exit points.

**ICOM line:** Airspace Constraints

**Glossary Text:** This data includes all airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Draft Flight Plan

**Glossary Text:** Preliminary route points based on airspace restrictions and NOTAMS.

**ICOM line:** Enemy Order of Battle

**Glossary Text:**

**ICOM line:** Enroute RFPs

**Glossary Text:** Radar fix points along the proposed route of flight to be used to update the navigation system.

**ICOM line:** Enroute Weather Data

**Glossary Text:** Forecast winds, hazardous weather, temperature, sea state, sea temperature, sunrise, sunset, moonrise, moonset, moon illumination, contrail altitude enroute to the AOR.

**ICOM line:** Flight Information Publications/NOTAMS

**Glossary Text:** Documents current locations, altitudes, refueling procedures, scheduling authority, hours of operation, and C/R plans for air refueling tracks world-wide. This publication also documents other airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Initialized MPS

**Glossary Text:** The Mission Planning System (MPS) is considered "initialized" once the current map, seasonal weather, airspace, threat, and radar cross section data is input.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Limiting Factors

**Glossary Text:** Impediments to mission accomplishment based upon feasibility analysis. This can be a result of resource availability or inadequate planning.

**ICOM line:** Number of Aircraft Required

**Glossary Text:** Number of bomber aircraft required to achieve mission objectives.

**ICOM line:** Request Communications Data

**Glossary Text:** Request for LOS and satellite frequencies (not provided by the tasking organization), satellite time and bandwidth, and crypto keys (radio and GPS).

### **Operational Activity: Develop Refueling Plan**

**Glossary Text:** Takes in current refueling track information (ARIP, ARCP, AREX, Altitudes, and C/R plan) and decides which ones best fit the mission. If a refueling track does not exist where one is required, enroute refueling or an ALTRV must be coordinated. Inputs draft flight for each aircraft in the bomber formation.

**ICOM line:** ALTRV requests

**Glossary Text:** Airspace requirements for refueling if published tracks are not

feasible or available.

**ICOM line:** Air Refueling Regulations

**Glossary Text:** Aircraft regulations governing refueling procedures, maximum/minimum altitudes, maximum on loads, etc.

**ICOM line:** Available Refueling Support

**Glossary Text:** Refueling assets made available to support bomber mission.

**ICOM line:** Draft Flight Plan

**Glossary Text:** Preliminary route points based on airspace restrictions and NOTAMS.

**ICOM line:** Flight Information Publications/NOTAMS

**Glossary Text:** Documents current locations, altitudes, refueling procedures, scheduling authority, hours of operation, and C/R plans for air refueling tracks world-wide. This publication also documents other airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Initial Fuel Required

**Glossary Text:** Total fuel onload requirement for each aircraft as well as the total fuel required for the formation for each refueling.

**ICOM line:** Initial Route

**Glossary Text:**

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Planned Refueling Tracks

**Glossary Text:** Planned areas and date/times where refueling is desired. These may or not be published tracks. If not, an ALTRV must be requested or other ARTCC coordination must be accomplished.

### **Operational Activity: Develop Tactical Deception Plan**

**Glossary Text:** Incorporates unit's TD strategy with initial routing. Agencies who are supporting this plan must be coordinated with and contingencies need to be vetted.

**ICOM line:** Initial Route

**Glossary Text:**

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** TD Coordination

**Glossary Text:** Coordination requests to support agencies to enable TD plan.

**ICOM line:** TD route

**Glossary Text:** The initial routing with tactical deception actions added.

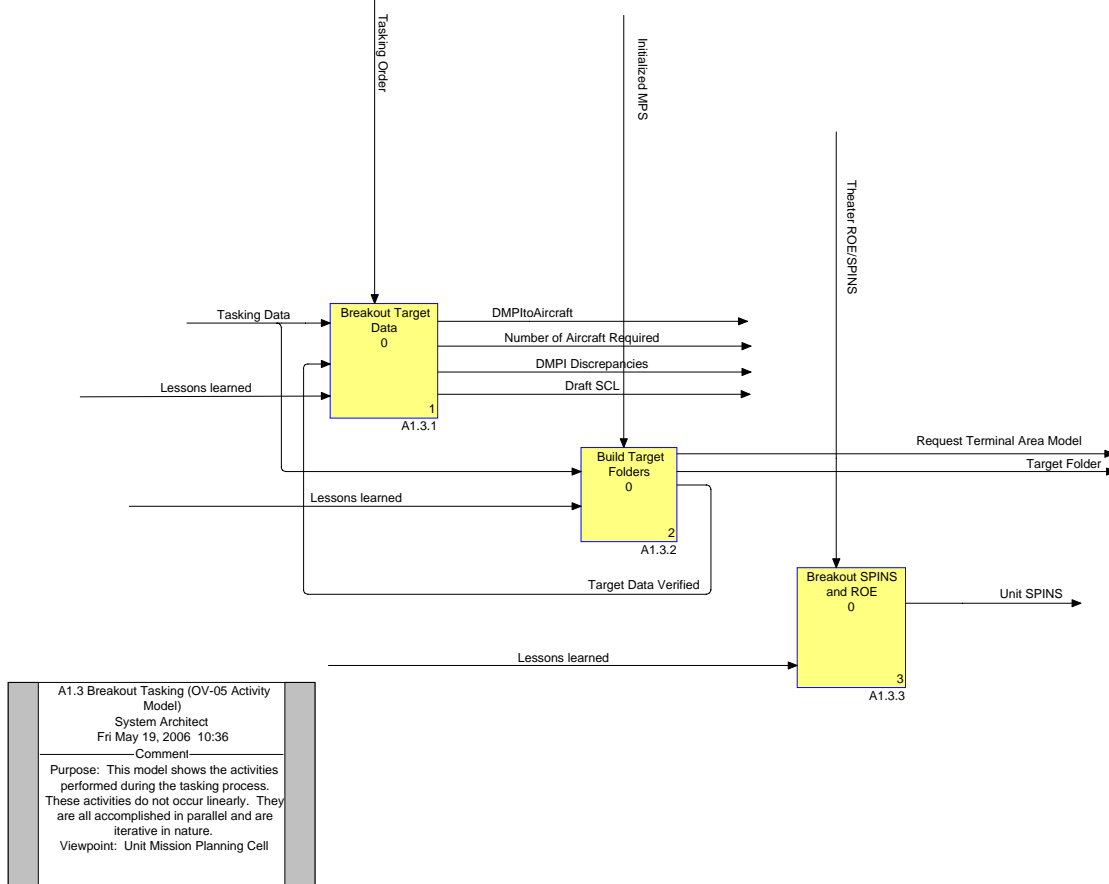
**ICOM line:** Tactical Deception Strategy

**Glossary Text:** Tactical deception activities to be used for specific mission. This strategy is determined well in advance of execution and includes



coordination with support agencies, foreign countries, air traffic control, and wing leadership. This strategy needs to be implemented early in the tactical planning process to be effective.

# Breakout Tasking



## Diagram Properties for: Breakout Tasking

Audit ID: afit

### Operational Activity: Breakout Target Data

**Glossary Text:** This process takes the tasked target data and assigns Desired Mean Points of Impact (DMPs) to individual aircraft routes. Number of aircraft to achieve mission objectives and an initial weapon load/configuration is determined by this process.

**ICOM line:** DMPI Discrepancies

**Glossary Text:** Discrepancies in DMPI geographic location, weaponeering solution, or imagery that must be resolved with the tasking organization.

**ICOM line:** DMPtoAircraft

**Glossary Text:** Tasked DMPs (based on associated weapon/fuze combination and desired effects) as assigned to individual aircraft.

**ICOM line:** Draft SCL

**Glossary Text:** Based on tasked DMPs (recommended weapon/fuze combinations), an initial stores configuration for each aircraft is determined.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Number of Aircraft Required

**Glossary Text:** Number of bomber aircraft required to achieve mission objectives.

**ICOM line:** Target Data Verified

**Glossary Text:** DMPI coordinates and elevation are verified. Weaponing solution is confirmed.

**ICOM line:** Tasking Data

**Glossary Text:** Impact points with associated recommended weapon/fuze combinations, and desired effects (probability of damage, collateral damage requirements) and time on target requirements from the tasking authority. Also includes kill box and orbit locations and vulnerability times for electronic warfare support, airborne alert interdiction or close air support missions.

**ICOM line:** Tasking Order

**Glossary Text:** This is the correspondence that officially tasked an operational unit to achieve a theater objective.

### **Operational Activity: Build Target Folders**

**Glossary Text:** This processes inputs target data into the Mission Planning System. This target data is verified for position accuracy, imagery accuracy, and appropriate weapon/fuze combination (this is done again later in the "Determine Weapon Damage Effects" process.

**ICOM line:** Initialized MPS

**Glossary Text:** The Mission Planning System (MPS) is considered "initialized" once the current map, seasonal weather, airspace, threat, and radar cross section data is input.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Request Terminal Area Model

**Glossary Text:** After tasking is broken out, Joint Air to Surface Standoff missile objectives are evaluated and Terminal Area Model (TAM) requirements are determined. TAMs are produced by command level intelligence organizations.

**ICOM line:** Target Data Verified

**Glossary Text:** DMPI coordinates and elevation are verified. Weaponing solution is confirmed.

**ICOM line:** Target Folder

**Glossary Text:** Contains verified DMPI coordinates and target imagery generation (as required).

**ICOM line:** Tasking Data

**Glossary Text:** Impact points with associated recommended weapon/fuze

combinations, and desired effects (probability of damage, collateral damage requirements) and time on target requirements from the tasking authority. Also includes kill box and orbit locations and vulnerability times for electronic warfare support, airborne alert interdiction or close air support missions.

**Operational Activity: Breakout SPINS and ROE**

**Glossary Text:** This process analyzes the Special Instructions and Rules of Engagement provided by the theater or the tasking authority and applies the applicable guidance to the transition and strike routes.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

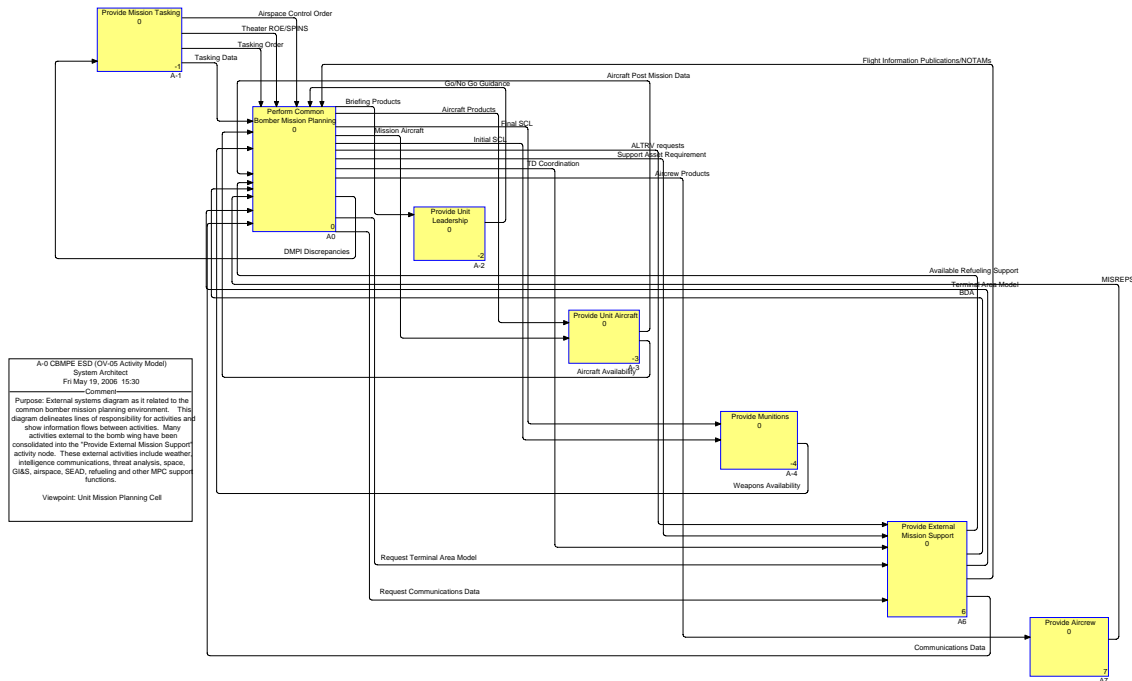
**ICOM line:** Theater ROE/SPINS

**Glossary Text:** Special Instructions generated by the theater detailing communications requirements, safe passage procedures, CSAR procedures, airspace restrictions, time sensitive targeting procedures, targeting requirements, etc.

**ICOM line:** Unit SPINS

**Glossary Text:** Unit employment guidance derived from the theater SPINS and ROE.

# CBMPE ESD



## Diagram Properties for: CBMPE ESD

Audit ID: afit

### Operational Activity: Provide Mission Tasking

**Glossary Text:** Tasking organization (AOC, JFACC) that provides, tasking, mission objectives, rules of engagement, Special Instructions, and airspace control.

**ICOM line:** DMPI Discrepancies

**Glossary Text:** Discrepancies in DMPI geographic location, weaponing solution, or imagery that must be resolved with the tasking organization.

**ICOM line:** Tasking Data

**Glossary Text:** Impact points with associated recommended weapon/fuze combinations, and desired effects (probability of damage, collateral damage requirements) and time on target requirements from the tasking authority. Also includes kill box and orbit locations and vulnerability times for electronic warfare support, airborne alert interdiction or close air support missions.

**ICOM line:** Tasking Order

**Glossary Text:** This is the correspondence that officially tasked an operational unit to achieve a theater objective.

**ICOM line:** Theater ROE/SPINS

**Glossary Text:** Special Instructions generated by the theater detailing communications requirements, safe passage procedures, CSAR procedures, airspace restrictions, time sensitive targeting procedures,

targeting requirements, etc.

### **Operational Activity: Provide Unit Leadership**

**Glossary Text:** Provides guidance for planning and execution processes. Also provides guidance for feasibility and risk assessments.

**ICOM line:** Briefing Products

**Glossary Text:** Briefings and other mission extracts used to disseminate the mission to leadership and other support organizations.

**ICOM line:** Go/No Go Guidance

**Glossary Text:** Strategic framework for Mission Planning Cell decision making.

### **Operational Activity: Provide Unit Aircraft**

**Glossary Text:** Unit maintenance organization that provides mission ready aircraft availability. For low observable aircraft this includes survivability assessments.

**ICOM line:** Aircraft Availability

**Glossary Text:** Breakdown of wing's aircraft into maintenance status categories (PMC, FMC, NMC, etc) as well as detailed maintenance discrepancy descriptions. Includes aircraft available for current tasking.

**ICOM line:** Aircraft Post Mission Data

**Glossary Text:** Post mission data from the aircraft that includes post release data, threats detected and system anomalies.

**ICOM line:** Aircraft Products

**Glossary Text:** All mission materials required for the aircraft to execute the mission. The mission will be transferred via Data Transfer Device (DTD) and will order of battle, targeting, route, GPS, crypto key and communication data.

**ICOM line:** Mission Aircraft

**Glossary Text:** Number of aircraft that will be used based on mission objectives, aircraft availability, and weapon availability.

### **Operational Activity: Provide Munitions**

**Glossary Text:** Process that provides weapon and fuze availability to accomplish mission objectives.

**ICOM line:** Final SCL

**Glossary Text:** Loadout that achieves employment objectives and has survivable routing. Includes weapon type, fuze type, fuze setting and weapon location (on the aircraft) assigned to each DMPI. If this SCL is different from what was tasked, the tasking agency must be coordinated.

-This is also the guided/unguided weapon summary.

**ICOM line:** Initial SCL

**Glossary Text:** Approved initial stores configuration based on aircraft, weapon,

and fuze availability and JFACC tasking.

**ICOM line:** Weapons Availability

**Glossary Text:** Numbers and types of munitions and fuzes located in the weapon storage area. Also includes numbers of weapons on order (with estimated delivery dates) and weapons stored at off-station locations.

## **Operational Activity: Perform Common Bomber Mission Planning**

**Glossary Text:** This process inputs a higher headquarters tasking and creates survivable routes which accomplish commander objectives.

**ICOM line:** ALTRV requests

**Glossary Text:** Airspace requirements for refueling if published tracks are not feasible or available.

**ICOM line:** Aircraft Availability

**Glossary Text:** Breakdown of wing's aircraft into maintenance status categories (PMC, FMC, NMC, etc) as well as detailed maintenance discrepancy descriptions. Includes aircraft available for current tasking.

**ICOM line:** Aircraft Post Mission Data

**Glossary Text:** Post mission data from the aircraft that includes post release data, threats detected and system anomalies.

**ICOM line:** Aircraft Products

**Glossary Text:** All mission materials required for the aircraft to execute the mission. The mission will be transferred via Data Transfer Device (DTD) and will order of battle, targeting, route, GPS, crypto key and communication data.

**ICOM line:** Aircrew Products

**Glossary Text:** Creates communication plan, weapons card, refueling (divert matrix), charts, and flight plan for aircrew use during mission execution.

**ICOM line:** Airspace Control Order

**Glossary Text:** Theater directive that outlines preferred routing once inside the AOR. Also, lists approved refueling tracks, ingress/egress routing, transition routes, no-fly areas, and special use airspace.

**ICOM line:** Available Refueling Support

**Glossary Text:** Refueling assets made available to support bomber mission.

**ICOM line:** BDA

**Glossary Text:** Bomb damage assesment from either the aircraft or from external agencies of actual targets engaged. Used to determine weaponeering and tactics effectiveness.

**ICOM line:** Briefing Products

**Glossary Text:** Briefings and other mission extracts used to disseminate the mission to leadership and other support organizations.

**ICOM line:** Communications Data

**Glossary Text:** Satellite and LOS frequency availability, satellite time availability, crypto and GPS keys.

**ICOM line:** DMPI Discrepancies

**Glossary Text:** Discrepancies in DMPI geographic location, weaponeering solution, or imagery that must be resolved with the tasking organization.

**ICOM line:** Final SCL

**Glossary Text:** Loadout that achieves employment objectives and has survivable routing. Includes weapon type, fuze type, fuze setting and weapon location (on the aircraft) assigned to each DMPI. If this SCL is different from what was tasked, the tasking agency must be coordinated.

-This is also the guided/unguided weapon summary.

**ICOM line:** Flight Information Publications/NOTAMs

**Glossary Text:** Documents current locations, altitudes, refueling procedures, scheduling authority, hours of operation, and C/R plans for air refueling tracks world-wide. This publication also documents other airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Go/No Go Guidance

**Glossary Text:** Strategic framework for Mission Planning Cell decision making.

**ICOM line:** Initial SCL

**Glossary Text:** Approved initial stores configuration based on aircraft, weapon, and fuze availability and JFACC tasking.

**ICOM line:** MISREPS

**Glossary Text:** Mission after action report completed by the aircrew. Outlines actual threats seen, actual targets engaged/tactics used, estimation of mission success, and deficiencies in the plan/products.

**ICOM line:** Mission Aircraft

**Glossary Text:** Number of aircraft that will be used based on mission objectives, aircraft availability, and weapon availability.

**ICOM line:** Request Communications Data

**Glossary Text:** Request for LOS and satellite frequencies (not provided by the tasking organization), satellite time and bandwidth, and crypto keys (radio and GPS).

**ICOM line:** Request Terminal Area Model

**Glossary Text:** After tasking is broken out, Joint Air to Surface Standoff missile objectives are evaluated and Terminal Area Model (TAM) requirements are determined. TAMs are produced by command level intelligence organizations.

**ICOM line:** Support Asset Requirement

**Glossary Text:** Request for support assets necessary to mitigate enemy threats. The assets may ground, air, or space based and are tasked to degrade or destroy the enemy air defense system and/or command and control network.

**ICOM line:** TD Coordination

**Glossary Text:** Coordination requests to support agencies to enable TD plan.

**ICOM line:** Tasking Data

**Glossary Text:** Impact points with associated recommended weapon/fuze



combinations, and desired effects (probability of damage, collateral damage requirements) and time on target requirements from the tasking authority. Also includes kill box and orbit locations and vulnerability times for electronic warfare support, airborne alert interdiction or close air support missions.

**ICOM line:** Tasking Order

**Glossary Text:** This is the correspondence that officially tasked an operational unit to achieve a theater objective.

**ICOM line:** Terminal Area Model

**Glossary Text:** Terminal Area Model built by intelligence organization that provides terminal guidance for the Joint Air to Surface Standoff Missile.

**ICOM line:** Theater ROE/SPINS

**Glossary Text:** Special Instructions generated by the theater detailing communications requirements, safe passage procedures, CSAR procedures, airspace restrictions, time sensitive targeting procedures, targeting requirements, etc.

**ICOM line:** Weapons Availability

**Glossary Text:** Numbers and types of munitions and fuzes located in the weapon storage area. Also includes numbers of weapons on order (with estimated delivery dates) and weapons stored at off-station locations.

### **Operational Activity: Provide External Mission Support**

**Glossary Text:** Provides refueling, targeting, electronic attack, and other mission support functions to enable execute in theater.

**ICOM line:** ALTRV requests

**Glossary Text:** Airspace requirements for refueling if published tracks are not feasible or available.

**ICOM line:** Available Refueling Support

**Glossary Text:** Refueling assets made available to support bomber mission.

**ICOM line:** BDA

**Glossary Text:** Bomb damage assesment from either the aircraft or from external agencies of actual targets engaged. Used to determine weaponeering and tactics effectiveness.

**ICOM line:** Communications Data

**Glossary Text:** Satellite and LOS frequency availability, satellite time availability, crypto and GPS keys.

**ICOM line:** Flight Information Publications/NOTAMs

**Glossary Text:** Documents current locations, altitudes, refueling procedures, scheduling authority, hours of operation, and C/R plans for air refueling tracks world-wide. This publication also documents other airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Request Communications Data

**Glossary Text:** Request for LOS and satellite frequencies (not provided by the

tasking organization), satellite time and bandwidth, and crypto keys (radio and GPS).

**ICOM line:** Request Terminal Area Model

**Glossary Text:** After tasking is broken out, Joint Air to Surface Standoff missile objectives are evaluated and Terminal Area Model (TAM) requirements are determined. TAMs are produced by command level intelligence organizations.

**ICOM line:** Support Asset Requirement

**Glossary Text:** Request for support assets necessary to mitigate enemy threats. The assets may ground, air, or space based and are tasked to degrade or destroy the enemy air defense system and/or command and control network.

**ICOM line:** TD Coordination

**Glossary Text:** Coordination requests to support agencies to enable TD plan.

**ICOM line:** Terminal Area Model

**Glossary Text:** Terminal Area Model built by intelligence organization that provides terminal guidance for the Joint Air to Surface Standoff Missile.

### **Operational Activity: Provide Aircrew**

**Glossary Text:** Provides mission ready aircrew for mission execution.

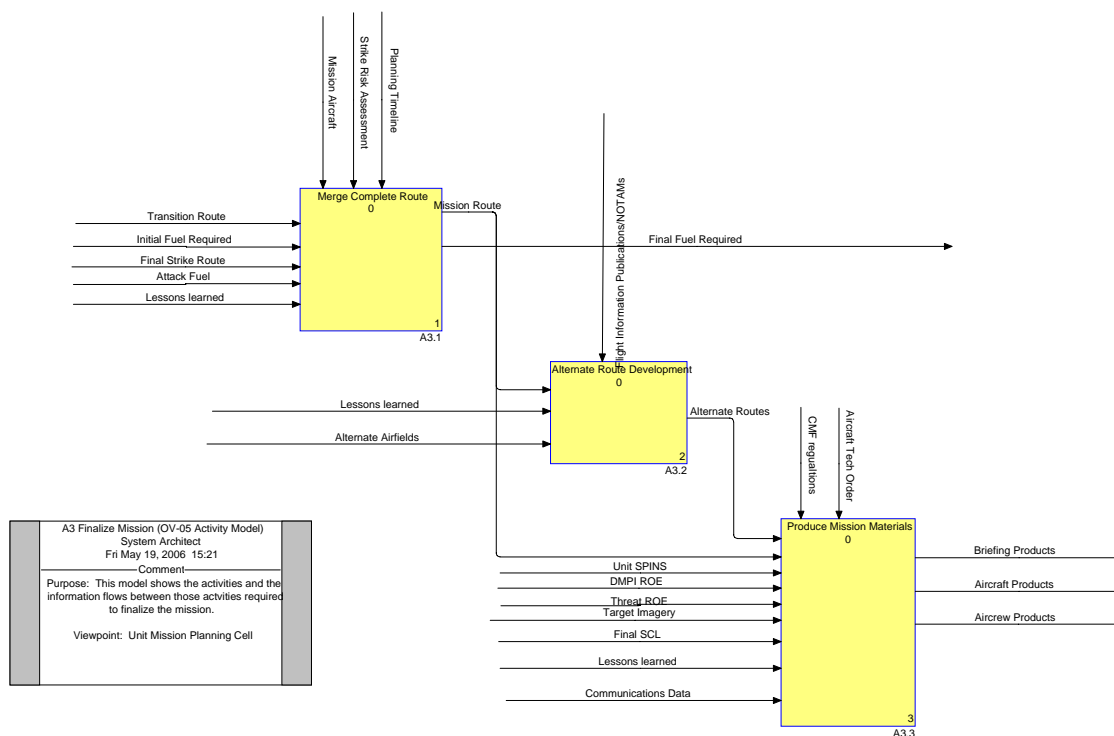
**ICOM line:** Aircrew Products

**Glossary Text:** Creates communication plan, weapons card, refueling (divert) matrix), charts, and flight plan for aircrew use during mission execution.

**ICOM line:** MISREPS

**Glossary Text:** Mission after action report completed by the aircrew. Outlines actual threats seen, actual targets engaged/tactics used, estimation of mission success, and deficiencies in the plan/products.

# Finalize Mission



## Diagram Properties for: Finalize Mission

Audit ID: afit

### Operational Activity: Merge Complete Route

**Glossary Text:** The MPC will merge the transition and strike routing for each aircraft. The MPC will QC the entire route paying particular attention to bomb runs, fuel requirements, winds, and airspace.

**ICOM line:** Attack Fuel

**Glossary Text:** Fuel required to accomplish the target attack.

**ICOM line:** Final Fuel Required

**Glossary Text:** Total fuel required (transition plus strike) for each aircraft to complete the mission.

**ICOM line:** Final Strike Route

**Glossary Text:** Deconflicted strike route that has been assessed as having an acceptable risk level.

**ICOM line:** Initial Fuel Required

**Glossary Text:** Total fuel onload requirement for each aircraft as well as the total fuel required for the formation for each refueling.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Aircraft

**Glossary Text:** Number of aircraft that will be used based on mission objectives, aircraft availability, and weapon availability.

**ICOM line:** Mission Route

**Glossary Text:** Integration of strike and transition routing for each bomber aircraft in the formation.

**ICOM line:** Planning Timeline

**Glossary Text:** Estimate of planning effort duration of the tasked mission based upon the requested time over target. This includes a detailed schedule for the mission planning cell as well as planned briefing, step, takeoff time, and recovery times.

**ICOM line:** Strike Risk Assessment

**Glossary Text:** Go/No Go decision based upon outcome of risk assessment.

**ICOM line:** Transition Route

**Glossary Text:** Round trip routing to theater that includes refueling locations, tactical deception plan (if applicable) and meets mission timing as directed by the tasking organization.

### **Operational Activity: Alternate Route Development**

**Glossary Text:** The MPC will plan alternate route segments to divert/recovery bases and/or alternate refueling tracks (if applicable).

**ICOM line:** Alternate Airfields

**Glossary Text:** Suitable recovery bases along the mission route that can be used for divert situations.

**ICOM line:** Alternate Routes

**Glossary Text:** Alternate route segments that contain waypoints to divert airfields, alternate refueling tracks, and/or back-up target (dump) target areas.

**ICOM line:** Flight Information Publications/NOTAMs

**Glossary Text:** Documents current locations, altitudes, refueling procedures, scheduling authority, hours of operation, and C/R plans for air refueling tracks world-wide. This publication also documents other airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Route

**Glossary Text:** Integration of strike and transition routing for each bomber aircraft in the formation.

### **Operational Activity: Produce Mission Materials**

**Glossary Text:** This process creates all mission products to be used by the aircrew, the aircraft, and other support organizations.

**ICOM line:** Aircraft Products

**Glossary Text:** All mission materials required for the aircraft to execute the mission. The mission will be transferred via Data Transfer Device (DTD) and will order of battle, targeting, route, GPS, crypto key and communication data.

**ICOM line:** Aircraft Tech Order

**Glossary Text:** Approved weapons and fuel configurations, radio configurations, data transfer device (interface), and electronic counter-measures configurations.

**ICOM line:** Aircrew Products

**Glossary Text:** Creates communication plan, weapons card, refueling (divert matrix), charts, and flight plan for aircrew use during mission execution.

**ICOM line:** Alternate Routes

**Glossary Text:** Alternate route segments that contain waypoints to divert airfields, alternate refueling tracks, and/or back-up target (dump) target areas.

**ICOM line:** Briefing Products

**Glossary Text:** Briefings and other mission extracts used to disseminate the mission to leadership and other support organizations.

**ICOM line:** CMF regulations

**Glossary Text:** Regulatory guidance specifying format, content, and products required for aircrew use.

**ICOM line:** Communications Data

**Glossary Text:** Satellite and LOS frequency availability, satellite time availability, crypto and GPS keys.

**ICOM line:** DMPI ROE

**Glossary Text:** Rules of engagement established for each DMPI that is tasked. This can include targeting restrictions such as coordinate only authorized or radar look required, release restrictions (impact angle, heading plane, ingress/egress headings, etc), degraded weapon procedures, and fuzing procedures. This should also include allowable contingency options (i.e. allowable impact angle range) for the crew.

**ICOM line:** Final SCL

**Glossary Text:** Loadout that achieves employment objectives and has survivable routing. Includes weapon type, fuze type, fuze setting and weapon location (on the aircraft) assigned to each DMPI. If this SCL is different from what was tasked, the tasking agency must be coordinated.

-This is also the guided/unguided weapon summary.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Route

**Glossary Text:** Integration of strike and transition routing for each bomber aircraft in the formation.

**ICOM line:** Target Imagery

**Glossary Text:** Target complex and DMPI imagery extracted from target folder amended for the applicable tactics (i.e appropriate look and squint angles) that will be used.

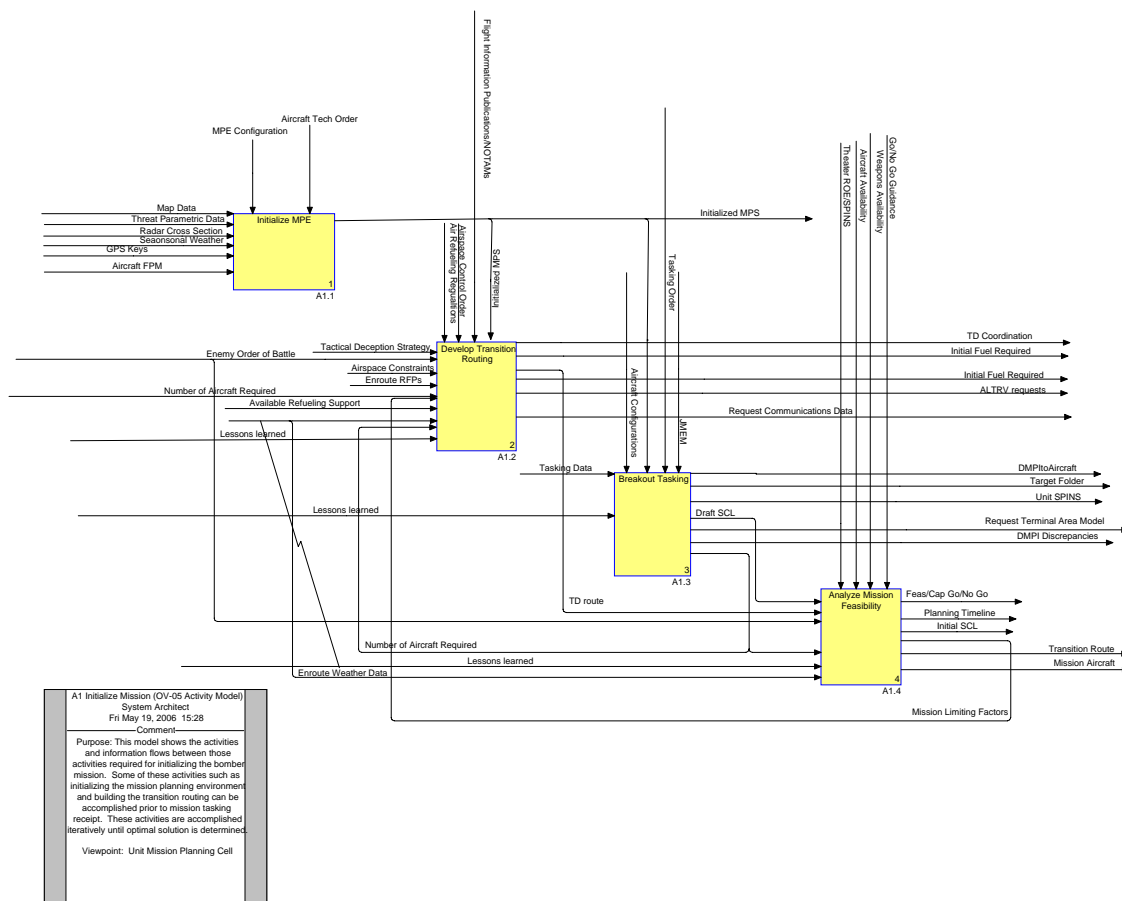
**ICOM line:** Threat ROE

**Glossary Text:** Threat rules of engagement as determined by the risk assessment. Identifies go/no go threats, minimum support assets required, and expected type/duration of support effects (jam on/off times, HARM shots, etc)

**ICOM line:** Unit SPINS

**Glossary Text:** Unit employment guidance derived from the theater SPINS and ROE.

# Initialize Mission



## Diagram Properties for: Initialize Mission

Audit ID: afit

### Operational Activity: Initialize MPE

**Glossary Text:** This process inputs the current Mapping, Charting, Geodesy and Imagery (MCG&I) Data, weather data, Global Positioning System (GPS) keys, terrain data, DAFIF, and threat files for the Area of Responsibility (AOR). This process will also update aircraft/missile Radar Cross Section (RCS) and Threat Information File (TIF) data as required. After this data has been entered, the MPE is considered "initialized" and planning can begin.

**ICOM line:** Aircraft FPM

**Glossary Text:** Aircraft flight performance parameters for takeoff, enroute cruise refueling, target attack, and recovery.

**ICOM line:** Aircraft Tech Order

**Glossary Text:** Approved weapons and fuel configurations, radio configurations, data transfer device (interface), and electronic counter-measures configurations.

**ICOM line:** GPS Keys

**Glossary Text:** GPS crypto key required for MPS initialization.

**ICOM line:** Initialized MPS

**Glossary Text:** The Mission Planning System (MPS) is considered "initialized" once the current map, seasonal weather, airspace, threat, and radar cross section data is input.

**ICOM line:** MPE Configuration

**Glossary Text:** The MPE hardware, software, and personnel must be properly trained and certified to participate in the mission planning process.

**ICOM line:** Map Data

**Glossary Text:** This includes the current Mapping, Charting, Geodesy and Imagery (MCG&I) data, radar fix point imagery, target imagery, terrain data (Digital Terrain Elevation Data), DAFIF, and Flight Information Publication (FLIP) data.

**ICOM line:** Radar Cross Section

**Glossary Text:** This includes RCS data for the aircraft and missiles.

**ICOM line:** Seasonal Weather

**Glossary Text:** This includes seasonal winds, hazardous weather, moon illumination, sunrise, sunset, solar flares, etc.

**ICOM line:** Threat Parametric Data

**Glossary Text:** This contains data which identifies the electronic parameters of the anticipated enemy threats. Typically this includes figures for ELNOT and DIQUP. Eitherway, this data needs to be sufficient to accurately characterize the threat.

### **Operational Activity: Develop Transition Routing**

**Glossary Text:** This process gathers planning data specific to the AOR sent by the theater control agency (i.e. C/JAOC). This data includes, Enemy Order of Battle (EOB) data, Airspace Control Order (ACO) data, enroute refueling track locations, enroute radar fix points, and overflight restrictions. This information could also include potential target areas/sets. This process allows the Mission Planning Cell (MPC) to determine potential transition routing to and from the AOR as well as ball park fuel requirements. This process develops the tactical deception plan if applicable. This process is accomplished in parallel with breakout tasking.

**ICOM line:** ALTRV requests

**Glossary Text:** Airspace requirements for refueling if published tracks are not feasible or available.

**ICOM line:** Air Refueling Regulations

**Glossary Text:** Aircraft regulations governing refueling procedures, maximum/minimum altitudes, maximum on loads, etc.

**ICOM line:** Airspace Constraints

**Glossary Text:** This data includes all airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute



restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Airspace Control Order

**Glossary Text:** Theater directive that outlines preferred routing once inside the AOR. Also, lists approved refueling tracks, ingress/egress routing, transition routes, no-fly areas, and special use airspace.

**ICOM line:** Available Refueling Support

**Glossary Text:** Refueling assets made available to support bomber mission.

**ICOM line:** Enemy Order of Battle

**Glossary Text:**

**ICOM line:** Enroute RFPs

**Glossary Text:** Radar fix points along the proposed route of flight to be used to update the navigation system.

**ICOM line:** Enroute Weather Data

**Glossary Text:** Forecast winds, hazardous weather, temperature, sea state, sea temperature, sunrise, sunset, moonrise, moonset, moon illumination, contrail altitude enroute to the AOR.

**ICOM line:** Flight Information Publications/NOTAMs

**Glossary Text:** Documents current locations, altitudes, refueling procedures, scheduling authority, hours of operation, and C/R plans for air refueling tracks world-wide. This publication also documents other airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Initial Fuel Required

**Glossary Text:** Total fuel onload requirement for each aircraft as well as the total fuel required for the formation for each refueling.

**ICOM line:** Initial Fuel Required

**Glossary Text:** Total fuel onload requirement for each aircraft as well as the total fuel required for the formation for each refueling.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Limiting Factors

**Glossary Text:** Impediments to mission accomplishment based upon feasibility analysis. This can be a result of resource availability or inadequate planning.

**ICOM line:** Number of Aircraft Required

**Glossary Text:** Number of bomber aircraft required to achieve mission objectives.

**ICOM line:** Request Communications Data

**Glossary Text:** Request for LOS and satellite frequencies (not provided by the tasking organization), satellite time and bandwidth, and crypto keys (radio and GPS).

**ICOM line:** TD Coordination

**Glossary Text:** Coordination requests to support agencies to enable TD plan.

**ICOM line:** TD route

**Glossary Text:** The initial routing with tactical deception actions added.

**ICOM line:** Tactical Deception Strategy

**Glossary Text:** Tactical deception activities to be used for specific mission. This strategy is determined well in advance of execution and includes coordination with support agencies, foreign countries, air traffic control, and wing leadership. This strategy needs to be implemented early in the tactical planning process to be effective.

### **Operational Activity: Breakout Tasking**

**Glossary Text:** This process inputs target location, time and suggested weapons into the mission planning environment and assigns them to target complexes. Each target complex is then assigned a unit aircraft. Additionally, the Desired Mean Points of Impact (DMPI) coordinates/imagery and recommended weapon/fuze combinations (AOC weaponeering solutions) are verified. Number of strike aircraft required to achieve mission objectives determined during this process. Target folders are started during this process. This process is accomplished in parallel with pre-planning tasks.

Do we need to verify the Theater weaponeering solution here?

Do we need to verify target coordinates?

**ICOM line:** Aircraft Configurations

**Glossary Text:** Tech order approved weapon load outs and configurations.

**ICOM line:** DMPI Discrepancies

**Glossary Text:** Discrepancies in DMPI geographic location, weaponeering solution, or imagery that must be resolved with the tasking organization.

**ICOM line:** DMPItoAircraft

**Glossary Text:** Tasked DMPIs (based on associated weapon/fuze combination and desired effects) as assigned to individual aircraft.

**ICOM line:** Draft SCL

**Glossary Text:** Based on tasked DMPIs (recommended weapon/fuze combinations), an initial stores configuration for each aircraft is determined.

**ICOM line:** Initialized MPS

**Glossary Text:** The Mission Planning System (MPS) is considered "initialized" once the current map, seasonal weather, airspace, threat, and radar cross section data is input.

**ICOM line:** JMEM

**Glossary Text:** Joint Munitions Effects Manual. Guidance for determining weaponeering solutions versus a variety of target sets.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Number of Aircraft Required

**Glossary Text:** Number of bomber aircraft required to achieve mission objectives.

**ICOM line:** Request Terminal Area Model

**Glossary Text:** After tasking is broken out, Joint Air to Surface Standoff missile objectives are evaluated and Terminal Area Model (TAM) requirements are determined. TAMs are produced by command level intelligence organizations.

**ICOM line:** Target Folder

**Glossary Text:** Contains verified DMPI coordinates and target imagery generation (as required).

**ICOM line:** Tasking Data

**Glossary Text:** Impact points with associated recommended weapon/fuze combinations, and desired effects (probability of damage, collateral damage requirements) and time on target requirements from the tasking authority. Also includes kill box and orbit locations and vulnerability times for electronic warfare support, airborne alert interdiction or close air support missions.

**ICOM line:** Tasking Order

**Glossary Text:** This is the correspondence that officially tasked an operational unit to achieve a theater objective.

**ICOM line:** Unit SPINS

**Glossary Text:** Unit employment guidance derived from the theater SPINS and ROE.

### **Operational Activity: Analyze Mission Feasibility**

**Glossary Text:** This process looks at the results of the tasking breakout, routing to and from the theater (TD route), tactical deception plan, theater Rules of Engagement (ROE) and SPINS (Special Instructions) to identify any limiting factors to mission accomplishment. This process also looks at weapon/fuze availability, aircraft availability or any mission information required to complete the planning process. The process concludes with a leadership go/no go decision, an initial weapon loadout for each aircraft and an initial MPC timeline for mission completion.

**ICOM line:** Aircraft Availability

**Glossary Text:** Breakdown of wing's aircraft into maintenance status categories (PMC, FMC, NMC, etc) as well as detailed maintenance discrepancy descriptions. Includes aircraft available for current tasking.

**ICOM line:** Draft SCL

**Glossary Text:** Based on tasked DMPIs (recommended weapon/fuze combinations), an initial stores configuration for each aircraft is determined.

**ICOM line:** Enemy Order of Battle

**Glossary Text:**

**ICOM line:** Enroute Weather Data

**Glossary Text:** Forecast winds, hazardous weather, temperature, sea state, sea

temperature, sunrise, sunset, moonrise, moonset, moon illumination, contrail altitude enroute to the AOR.

**ICOM line:** Feas/Cap Go/No Go

**Glossary Text:** Leadership decision whether to proceed with mission planning after analyzing contingencies and identifying limiting factors.

**ICOM line:** Go/No Go Guidance

**Glossary Text:** Strategic framework for Mission Planning Cell decision making.

**ICOM line:** Initial SCL

**Glossary Text:** Approved initial stores configuration based on aircraft, weapon, and fuze availability and JFACC tasking.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Aircraft

**Glossary Text:** Number of aircraft that will be used based on mission objectives, aircraft availability, and weapon availability.

**ICOM line:** Mission Limiting Factors

**Glossary Text:** Impediments to mission accomplishment based upon feasibility analysis. This can be a result of resource availability or inadequate planning.

**ICOM line:** Number of Aircraft Required

**Glossary Text:** Number of bomber aircraft required to achieve mission objectives.

**ICOM line:** Planning Timeline

**Glossary Text:** Estimate of planning effort duration of the tasked mission based upon the requested time over target. This includes a detailed schedule for the mission planning cell as well as planned briefing, step, takeoff time, and recovery times.

**ICOM line:** TD route

**Glossary Text:** The initial routing with tactical deception actions added.

**ICOM line:** Theater ROE/SPINS

**Glossary Text:** Special Instructions generated by the theater detailing communications requirements, safe passage procedures, CSAR procedures, airspace restrictions, time sensitive targeting procedures, targeting requirements, etc.

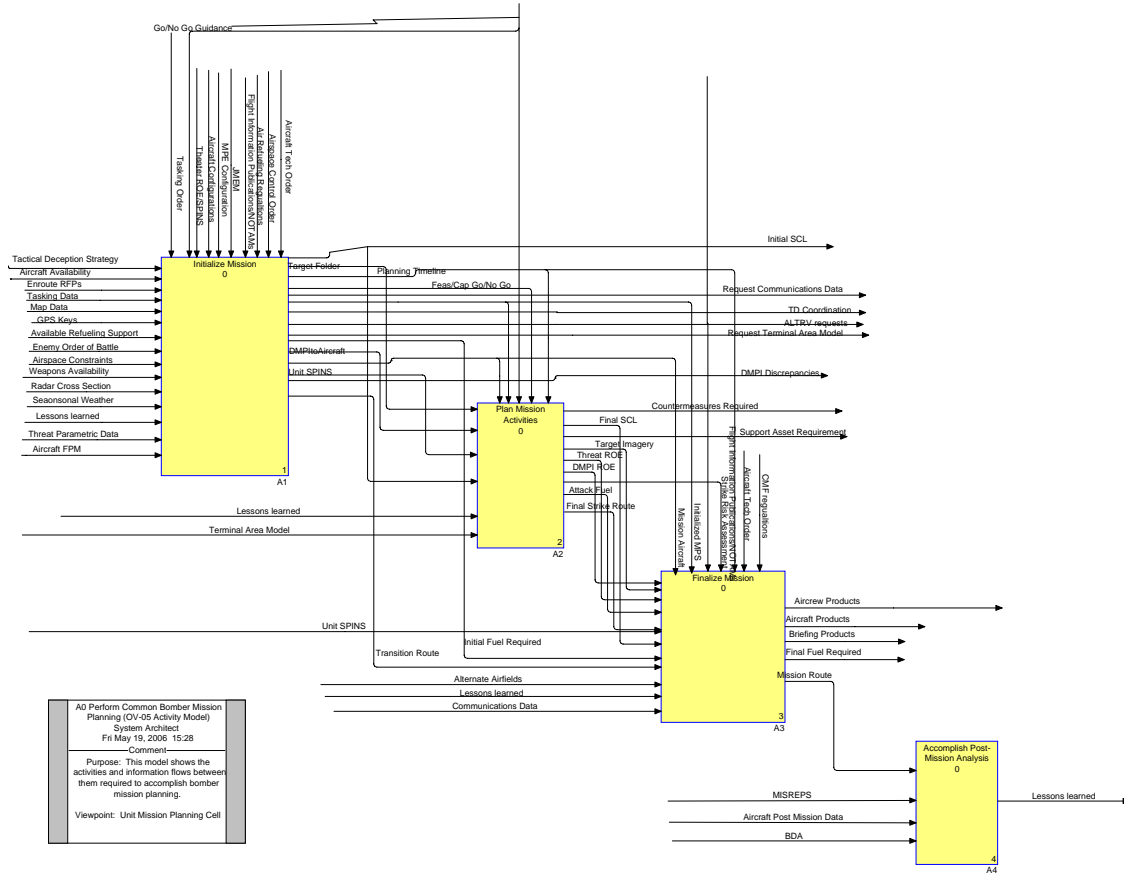
**ICOM line:** Transition Route

**Glossary Text:** Round trip routing to theater that includes refueling locations, tactical deception plan (if applicable) and meets mission timing as directed by the tasking organization.

**ICOM line:** Weapons Availability

**Glossary Text:** Numbers and types of munitions and fuzes located in the weapon storage area. Also includes numbers of weapons on order (with estimated delivery dates) and weapons stored at off-station locations.

# Perform Common Bomber Mission Planning



## Diagram Properties for: Perform Common Bomber Mission Planning

**Audit ID:** afit

### Operational Activity: Initialize Mission

**Glossary Text:** This process is divided into four separate tasks that begins when the operational unit gets indications of an imminent tasking. These tasks are initialize the Mission Planning Environment (MPE), accomplish pre-planning tasks, break out tasking data, and analyze mission feasibility.

**ICOM line:** ALTRV requests

**Glossary Text:** Airspace requirements for refueling if published tracks are not feasible or available.

**ICOM line:** Air Refueling Regualtions

**Glossary Text:** Aircraft regulations governing refueling procedures, maximum/minimum altitudes, maximum on loads, etc.

**ICOM line:** Aircraft Availability

**Glossary Text:** Breakdown of wing's aircraft into maintenance status categories (PMC, FMC, NMC, etc) as well as detailed maintenance discrepancy

descriptions. Includes aircraft available for current tasking.

**ICOM line:** Aircraft Configurations

**Glossary Text:** Tech order approved weapon load outs and configurations.

**ICOM line:** Aircraft FPM

**Glossary Text:** Aircraft flight performance parameters for takeoff, enroute cruise refueling, target attack, and recovery.

**ICOM line:** Aircraft Tech Order

**Glossary Text:** Approved weapons and fuel configurations, radio configurations, data transfer device (interface), and electronic counter-measures configurations.

**ICOM line:** Airspace Constraints

**Glossary Text:** This data includes all airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Airspace Control Order

**Glossary Text:** Theater directive that outlines preferred routing once inside the AOR. Also, lists approved refueling tracks, ingress/egress routing, transition routes, no-fly areas, and special use airspace.

**ICOM line:** Available Refueling Support

**Glossary Text:** Refueling assets made available to support bomber mission.

**ICOM line:** DMPI Discrepancies

**Glossary Text:** Discrepancies in DMPI geographic location, weaponeering solution, or imagery that must be resolved with the tasking organization.

**ICOM line:** DMPItoAircraft

**Glossary Text:** Tasked DMPIs (based on associated weapon/fuze combination and desired effects) as assigned to individual aircraft.

**ICOM line:** Enemy Order of Battle

**Glossary Text:**

**ICOM line:** Enroute RFPs

**Glossary Text:** Radar fix points along the proposed route of flight to be used to update the navigation system.

**ICOM line:** Feas/Cap Go/No Go

**Glossary Text:** Leadership decision whether to proceed with mission planning after analyzing contingencies and identifying limiting factors.

**ICOM line:** Flight Information Publications/NOTAMs

**Glossary Text:** Documents current locations, altitudes, refueling procedures, scheduling authority, hours of operation, and C/R plans for air refueling tracks world-wide. This publication also documents other airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** GPS Keys

**Glossary Text:** GPS crypto key required for MPS initialization.

**ICOM line:** Go/No Go Guidance

**Glossary Text:** Strategic framework for Mission Planning Cell decision making.

**ICOM line:** Initial Fuel Required

**Glossary Text:** Total fuel onload requirement for each aircraft as well as the total fuel required for the formation for each refueling.

**ICOM line:** Initial SCL

**Glossary Text:** Approved initial stores configuration based on aircraft, weapon, and fuze availability and JFACC tasking.

**ICOM line:** Initialized MPS

**Glossary Text:** The Mission Planning System (MPS) is considered "initialized" once the current map, seasonal weather, airspace, threat, and radar cross section data is input.

**ICOM line:** JMEM

**Glossary Text:** Joint Munitions Effects Manual. Guidance for determining weaponeering solutions versus a variety of target sets.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** MPE Configuration

**Glossary Text:** The MPE hardware, software, and personnel must be properly trained and certified to participate in the mission planning process.

**ICOM line:** Map Data

**Glossary Text:** This includes the current Mapping, Charting, Geodesy and Imagery (MCG&I) data, radar fix point imagery, target imagery, terrain data (Digital Terrain Elevation Data), DAFIF, and Flight Information Publication (FLIP) data.

**ICOM line:** Mission Aircraft

**Glossary Text:** Number of aircraft that will be used based on mission objectives, aircraft availability, and weapon availability.

**ICOM line:** Planning Timeline

**Glossary Text:** Estimate of planning effort duration of the tasked mission based upon the requested time over target. This includes a detailed schedule for the mission planning cell as well as planned briefing, step, takeoff time, and recovery times.

**ICOM line:** Radar Cross Section

**Glossary Text:** This includes RCS data for the aircraft and missiles.

**ICOM line:** Request Communications Data

**Glossary Text:** Request for LOS and satellite frequencies (not provided by the tasking organization), satellite time and bandwidth, and crypto keys (radio and GPS).

**ICOM line:** Request Terminal Area Model

**Glossary Text:** After tasking is broken out, Joint Air to Surface Standoff missile objectives are evaluated and Terminal Area Model (TAM) requirements are determined. TAMs are produced by command level intelligence organizations.

**ICOM line:** Seasonal Weather

**Glossary Text:** This includes seasonal winds, hazardous weather, moon illumination, sunrise, sunset, solar flares, etc.

**ICOM line:** TD Coordination

**Glossary Text:** Coordination requests to support agencies to enable TD plan.

**ICOM line:** Tactical Deception Strategy

**Glossary Text:** Tactical deception activities to be used for specific mission. This strategy is determined well in advance of execution and includes coordination with support agencies, foreign countries, air traffic control, and wing leadership. This strategy needs to be implemented early in the tactical planning process to be effective.

**ICOM line:** Target Folder

**Glossary Text:** Contains verified DMPI coordinates and target imagery generation (as required).

**ICOM line:** Tasking Data

**Glossary Text:** Impact points with associated recommended weapon/fuze combinations, and desired effects (probability of damage, collateral damage requirements) and time on target requirements from the tasking authority. Also includes kill box and orbit locations and vulnerability times for electronic warfare support, airborne alert interdiction or close air support missions.

**ICOM line:** Tasking Order

**Glossary Text:** This is the correspondence that officially tasked an operational unit to achieve a theater objective.

**ICOM line:** Theater ROE/SPINS

**Glossary Text:** Special Instructions generated by the theater detailing communications requirements, safe passage procedures, CSAR procedures, airspace restrictions, time sensitive targeting procedures, targeting requirements, etc.

**ICOM line:** Threat Parametric Data

**Glossary Text:** This contains data which identifies the electronic parameters of the anticipated enemy threats. Typically this includes figures for ELNOT and DIQUP. Eitherway, this data needs to be sufficient to accurately characterize the threat.

**ICOM line:** Transition Route

**Glossary Text:** Round trip routing to theater that includes refueling locations, tactical deception plan (if applicable) and meets mission timing as directed by the tasking organization.

**ICOM line:** Unit SPINS

**Glossary Text:** Unit employment guidance derived from the theater SPINS and ROE.

**ICOM line:** Weapons Availability

**Glossary Text:** Numbers and types of munitions and fuzes located in the weapon storage area. Also includes numbers of weapons on order (with estimated delivery dates) and weapons stored at off-station locations.

### **Operational Activity: Plan Mission Activities**

**Glossary Text:** This process is comprised of four activities. The process begins once the tasking is received and the MPE is initialized. The tasks



accomplished in this process are plan transition route, plan strike route, determine deconfliction plan, and complete risk assessment.

**ICOM line:** Attack Fuel

**Glossary Text:** Fuel required to accomplish the target attack.

**ICOM line:** Countermeasures Required

**Glossary Text:** Required aircraft countermeasures for the anticipated threat.

This includes the appropriate electronic measures software/hardware load as well expendables.

**ICOM line:** DMPI ROE

**Glossary Text:** Rules of engagement established for each DMPI that is tasked.

This can include targeting restrictions such as coordinate only authorized or radar look required, release restrictions (impact angle, heading plane, ingress/egress headings, etc), degraded weapon procedures, and fuzing procedures. This should also include allowable contingency options (i.e. allowable impact angle range) for the crew.

**ICOM line:** DMPItoAircraft

**Glossary Text:** Tasked DMPIs (based on associated weapon/fuze combination and desired effects) as assigned to individual aircraft.

**ICOM line:** Feas/Cap Go/No Go

**Glossary Text:** Leadership decision whether to proceed with mission planning after analyzing contingencies and identifying limiting factors.

**ICOM line:** Final SCL

**Glossary Text:** Loadout that achieves employment objectives and has survivable routing. Includes weapon type, fuze type, fuze setting and weapon location (on the aircraft) assigned to each DMPI. If this SCL is different from what was tasked, the tasking agency must be coordinated.

-This is also the guided/unguided weapon summary.

**ICOM line:** Go/No Go Guidance

**Glossary Text:** Strategic framework for Mission Planning Cell decision making.

**ICOM line:** Initial SCL

**Glossary Text:** Approved initial stores configuration based on aircraft, weapon, and fuze availability and JFACC tasking.

**ICOM line:** Initialized MPS

**Glossary Text:** The Mission Planning System (MPS) is considered "initialized" once the current map, seasonal weather, airspace, threat, and radar cross section data is input.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Aircraft

**Glossary Text:** Number of aircraft that will be used based on mission objectives, aircraft availability, and weapon availability.

**ICOM line:** Planning Timeline

**Glossary Text:** Estimate of planning effort duration of the tasked mission based

upon the requested time over target. This includes a detailed schedule for the mission planning cell as well as planned briefing, step, takeoff time, and recovery times.

**ICOM line:** Strike Risk Assessment

**Glossary Text:** Go/No Go decision based upon outcome of risk assessment.

**ICOM line:** Support Asset Requirement

**Glossary Text:** Request for support assets necessary to mitigate enemy threats. The assets may ground, air, or space based and are tasked to degrade or destroy the enemy air defense system and/or command and control network.

**ICOM line:** Target Folder

**Glossary Text:** Contains verified DMPI coordinates and target imagery generation (as required).

**ICOM line:** Target Imagery

**Glossary Text:** Target complex and DMPI imagery extracted from target folder amended for the applicable tactics (i.e appropriate look and squint angles) that will be used.

**ICOM line:** Terminal Area Model

**Glossary Text:** Terminal Area Model built by intelligence organization that provides terminal guidance for the Joint Air to Surface Standoff Missile.

**ICOM line:** Threat ROE

**Glossary Text:** Threat rules of engagement as determined by the risk assessment. Identifies go/no go threats, minimum support assets required, and expected type/duration of support effects (jam on/off times, HARM shots, etc)

### **Operational Activity: Finalize Mission**

**Glossary Text:** This process is comprised of three activities. The process begins once the strike and transition routing is created and approved. The sub-tasks of this process are merge complete route, develop alternate routes, and produce mission materials.

**ICOM line:** Aircraft Products

**Glossary Text:** All mission materials required for the aircraft to execute the mission. The mission will be transferred via Data Transfer Device (DTD) and will order of battle, targeting, route, GPS, crypto key and communication data.

**ICOM line:** Aircraft Tech Order

**Glossary Text:** Approved weapons and fuel configurations, radio configurations, data transfer device (interface), and electronic counter-measures configurations.

**ICOM line:** Aircrew Products

**Glossary Text:** Creates communication plan, weapons card, refueling (divert matrix), charts, and flight plan for aircrew use during mission execution.

**ICOM line:** Alternate Airfields

**Glossary Text:** Suitable recovery bases along the mission route that can be

used for divert situations.

**ICOM line:** Attack Fuel

**Glossary Text:** Fuel required to accomplish the target attack.

**ICOM line:** Briefing Products

**Glossary Text:** Briefings and other mission extracts used to disseminate the mission to leadership and other support organizations.

**ICOM line:** CMF regulations

**Glossary Text:** Regulatory guidance specifying format, content, and products required for aircrew use.

**ICOM line:** Communications Data

**Glossary Text:** Satellite and LOS frequency availability, satellite time availability, crypto and GPS keys.

**ICOM line:** Communications Data

**Glossary Text:** Satellite and LOS frequency availability, satellite time availability, crypto and GPS keys.

**ICOM line:** DMPI ROE

**Glossary Text:** Rules of engagement established for each DMPI that is tasked. This can include targeting restrictions such as coordinate only authorized or radar look required, release restrictions (impact angle, heading plane, ingress/egress headings, etc), degraded weapon procedures, and fuzing procedures. This should also include allowable contingency options (i.e. allowable impact angle range) for the crew.

**ICOM line:** Final Fuel Required

**Glossary Text:** Total fuel required (transition plus strike) for each aircraft to complete the mission.

**ICOM line:** Final SCL

**Glossary Text:** Loadout that achieves employment objectives and has survivable routing. Includes weapon type, fuze type, fuze setting and weapon location (on the aircraft) assigned to each DMPI. If this SCL is different from what was tasked, the tasking agency must be coordinated.

-This is also the guided/unguided weapon summary.

**ICOM line:** Final Strike Route

**Glossary Text:** Deconflicted strike route that has been assessed as having an acceptable risk level.

**ICOM line:** Flight Information Publications/NOTAMs

**Glossary Text:** Documents current locations, altitudes, refueling procedures, scheduling authority, hours of operation, and C/R plans for air refueling tracks world-wide. This publication also documents other airspace restrictions not included in the Airspace Control Order (ACO). This data typically includes enroute restrictions such as country overflight, Altitude Reservation (ALTRV) requirements and Notices to Airman (NOTAMS).

**ICOM line:** Initial Fuel Required

**Glossary Text:** Total fuel onload requirement for each aircraft as well as the total fuel required for the formation for each refueling.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Route

**Glossary Text:** Integration of strike and transition routing for each bomber aircraft in the formation.

**ICOM line:** Planning Timeline

**Glossary Text:** Estimate of planning effort duration of the tasked mission based upon the requested time over target. This includes a detailed schedule for the mission planning cell as well as planned briefing, step, takeoff time, and recovery times.

**ICOM line:** Strike Risk Assessment

**Glossary Text:** Go/No Go decision based upon outcome of risk assessment.

**ICOM line:** Target Imagery

**Glossary Text:** Target complex and DMPI imagery extracted from target folder amended for the applicable tactics (i.e appropriate look and squint angles) that will be used.

**ICOM line:** Threat ROE

**Glossary Text:** Threat rules of engagement as determined by the risk assessment. Identifies go/no go threats, minimum support assets required, and expected type/duration of support effects (jam on/off times, HARM shots, etc)

**ICOM line:** Transition Route

**Glossary Text:** Round trip routing to theater that includes refueling locations, tactical deception plan (if applicable) and meets mission timing as directed by the tasking organization.

**ICOM line:** Unit SPINS

**Glossary Text:** Unit employment guidance derived from the theater SPINS and ROE.

### **Operational Activity: Accomplish Post-Mission Analysis**

**Glossary Text:** This process captures post mission data to include post weapon release data, threat data, actual weather, airspace anomalies, mission product deficiencies, deconfliction problems, communication shortfalls, etc and fuses them into lessons learned. Lessons learn will then be fed back into the beginning of the mission planning process.

**ICOM line:** Aircraft Post Mission Data

**Glossary Text:** Post mission data from the aircraft that includes post release data, threats detected and system anomalies.

**ICOM line:** BDA

**Glossary Text:** Bomb damage assesment from either the aircraft or from external agencies of actual targets engaged. Used to determine weaponeering and tactics effectiveness.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

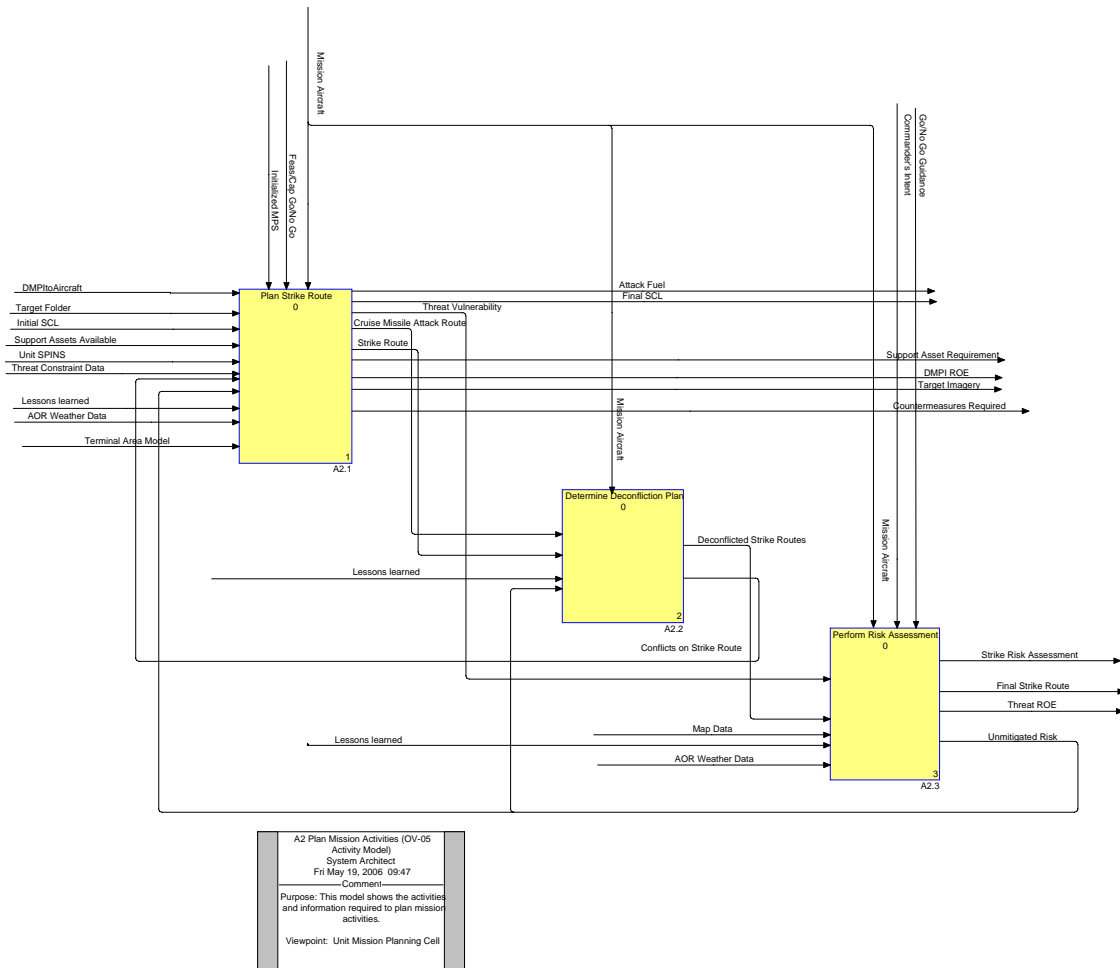
**ICOM line:** MISREPS

**Glossary Text:** Mission after action report completed by the aircrew. Outlines actual threats seen, actual targets engaged/tactics used, estimation of mission success, and deficiencies in the plan/products.

**ICOM line:** Mission Route

**Glossary Text:** Integration of strike and transition routing for each bomber aircraft in the formation.

# Plan Mission Activities



## Diagram Properties for: Plan Mission Activities

Audit ID: afit

### Operational Activity: Plan Strike Route

**Glossary Text:** This process encompasses four sub processes. They are: set up threat environment, plan target attack, plan threat area route, and determine weapon damage effects. This process results in survivable routing from the first detection point until out of enemy radar coverage. The route must also strike assigned targets and achieve the required mission effect. The results of this process will be used to make a risk assessment.

**ICOM line:** AOR Weather Data

**Glossary Text:** Predicted and current weather conditions in the AOR. This should include hazardous weather activity, winds (surface and winds at altitude), contrail altitude, cloud altitude, moon illumination, sunrise, sunset, moonrise, moonset, sea state, ocean temperature, and solar data.

**ICOM line:** Attack Fuel

**Glossary Text:** Fuel required to accomplish the target attack.

**ICOM line:** Conflicts on Strike Route

**Glossary Text:** Geographic, time, or altitude conflicts between strike or support aircraft/missiles that must be resolved prior to execution.

**ICOM line:** Countermeasures Required

**Glossary Text:** Required aircraft countermeasures for the anticipated threat.

This includes the appropriate electronic measures software/hardware load as well expendables.

**ICOM line:** Cruise Missile Attack Route

**Glossary Text:** Cruise missile waypoints and altitudes enroute to the target area.

This route also includes terminal area maneuvers.

**ICOM line:** DMPI ROE

**Glossary Text:** Rules of engagement established for each DMPI that is tasked.

This can include targeting restrictions such as coordinate only authorized or radar look required, release restrictions (impact angle, heading plane, ingress/egress headings, etc), degraded weapon procedures, and fuzing procedures. This should also include allowable contingency options (i.e. allowable impact angle range) for the crew.

**ICOM line:** DMPItoAircraft

**Glossary Text:** Tasked DMPIs (based on associated weapon/fuze combination and desired effects) as assigned to individual aircraft.

**ICOM line:** Feas/Cap Go/No Go

**Glossary Text:** Leadership decision whether to proceed with mission planning after analyzing contingencies and identifying limiting factors.

**ICOM line:** Final SCL

**Glossary Text:** Loadout that achieves employment objectives and has survivable routing. Includes weapon type, fuze type, fuze setting and weapon location (on the aircraft) assigned to each DMPI. If this SCL is different from what was tasked, the tasking agency must be coordinated.

-This is also the guided/unguided weapon summary.

**ICOM line:** Initial SCL

**Glossary Text:** Approved initial stores configuration based on aircraft, weapon, and fuze availability and JFACC tasking.

**ICOM line:** Initialized MPS

**Glossary Text:** The Mission Planning System (MPS) is considered "initialized" once the current map, seasonal weather, airspace, threat, and radar cross section data is input.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Aircraft

**Glossary Text:** Number of aircraft that will be used based on mission objectives, aircraft availability, and weapon availability.

**ICOM line:** Strike Route

**Glossary Text:** Minimum risk route based on the tactical route. This route achieves the optimal survivability while achieving JFACC objectives.

**ICOM line:** Support Asset Requirement

**Glossary Text:** Request for support assets necessary to mitigate enemy threats. The assets may ground, air, or space based and are tasked to degrade or destroy the enemy air defense system and/or command and control network.

**ICOM line:** Support Assets Available

**Glossary Text:** Air, ground, space, or information platforms made available to help mitigate threat risk.

**ICOM line:** Target Folder

**Glossary Text:** Contains verified DMPI coordinates and target imagery generation (as required).

**ICOM line:** Target Imagery

**Glossary Text:** Target complex and DMPI imagery extracted from target folder amended for the applicable tactics (i.e appropriate look and squint angles) that will be used.

**ICOM line:** Terminal Area Model

**Glossary Text:** Terminal Area Model built by intelligence organization that provides terminal guidance for the Joint Air to Surface Standoff Missile.

**ICOM line:** Threat Constraint Data

**Glossary Text:** The MPC will decide maximum fuel (or range) to be used for the strike routing, set acceptable range for ingress and egress headings, determine width of release corridors, determine maximum weapon bay door open time, and determine threat priorities.

**ICOM line:** Threat Vulnerability

**Glossary Text:** Evaluation of the aircraft vulnerability to enemy threats the strike phase of the mission. This assessment considers time spent in detection and engagement zones of factor threats which could result in a successful enemy engagement.

**ICOM line:** Unit SPINS

**Glossary Text:** Unit employment guidance derived from the theater SPINS and ROE.

**ICOM line:** Unmitigated Risk

**Glossary Text:** Factors (threats, weather, terrain, etc.) that imposes unacceptable risk to the mission or inadequate deconfliction.

### **Operational Activity: Determine Deconfliction Plan**

**Glossary Text:** Once the each strike route has been determined for the formation, the MPC will ensure time, position, and/or altitude deconfliction between all players. Deconfliction also ensures every DMPI is adequately covered and that Times over Target (TOT) are appropriately compressed for each target complex. This includes players not necessarily part of the bomber formation.

**ICOM line:** Conflicts on Strike Route



**Glossary Text:** Geographic, time, or altitude conflicts between strike or support aircraft/missiles that must be resolved prior to execution.

**ICOM line:** Cruise Missile Attack Route

**Glossary Text:** Cruise missile waypoints and altitudes enroute to the target area. This route also includes terminal area maneuvers.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Strike Route

**Glossary Text:** Minimum risk route based on the tactical route. This route achieves the optimal survivability while achieving JFACC objectives.

**ICOM line:** Unmitigated Risk

**Glossary Text:** Factors (threats, weather, terrain, etc.) that imposes unacceptable risk to the mission or inadequate deconfliction.

### **Operational Activity: Perform Risk Assessment**

**Glossary Text:** The MPC and unit leadership will consider all known factors impeding mission accomplishment and make a probability of success determination. The risk factors include weather, maintenance status, sortie duration, enemy threats, complexity of tactics, experience of aircrew, etc. Evaluation of aircraft vulnerability during the strike phase of the mission. This assessment is based on the time spent in detection and/or engagement zones of factor threats which could result in a successful enemy engagement. The result of this process is a go/no go decision and threat rules of engagement for the mission.

**ICOM line:** AOR Weather Data

**Glossary Text:** Predicted and current weather conditions in the AOR. This should include hazardous weather activity, winds (surface and winds at altitude), contrail altitude, cloud altitude, moon illumination, sunrise, sunset, moonrise, moonset, sea state, ocean temperature, and solar data.

**ICOM line:** Commander's Intent

**Glossary Text:** The JFACC methodology and vision on the prosecution of the air campaign. Sets guidelines for mission priorities, acceptable risk, and resource allocation.

**ICOM line:** Deconflicted Strike Routes

**Glossary Text:** Strike routes that have been deconflicted in time geographic position and altitude.

**ICOM line:** Final Strike Route

**Glossary Text:** Deconflicted strike route that has been assessed as having an acceptable risk level.

**ICOM line:** Go/No Go Guidance

**Glossary Text:** Strategic framework for Mission Planning Cell decision making.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Map Data

**Glossary Text:** This includes the current Mapping, Charting, Geodesy and Imagery (MCG&I) data, radar fix point imagery, target imagery, terrain data (Digital Terrain Elevation Data), DAFIF, and Flight Information Publication (FLIP) data.

**ICOM line:** Strike Risk Assessment

**Glossary Text:** Go/No Go decision based upon outcome of risk assessment.

**ICOM line:** Threat ROE

**Glossary Text:** Threat rules of engagement as determined by the risk assessment. Identifies go/no go threats, minimum support assets required, and expected type/duration of support effects (jam on/off times, HARM shots, etc)

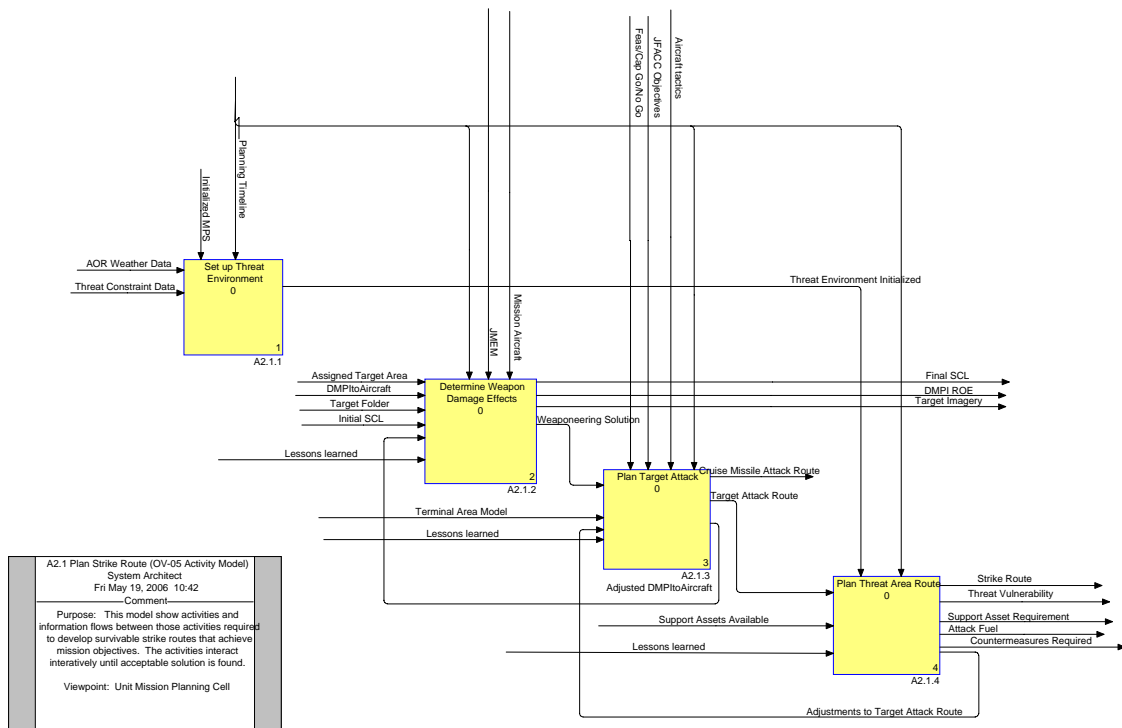
**ICOM line:** Threat Vulnerability

**Glossary Text:** Evaluation of the aircraft vulnerability to enemy threats the strike phase of the mission. This assessment considers time spent in detection and engagement zones of factor threats which could result in a successful enemy engagement.

**ICOM line:** Unmitigated Risk

**Glossary Text:** Factors (threats, weather, terrain, etc.) that imposes unacceptable risk to the mission or inadequate deconfliction.

# Plan Strike Route



## Diagram Properties for: Plan Strike Route

Audit ID: afit

### Operational Activity: Set up Threat Environment

**Glossary Text:** This process uses the EOB (already entered in system during Accomplish Pre-Planning Activities) and adds MPC determined constraint data unique to each mission. This constraint data includes ingress/egress headings, maximum fuel/range, release corridors, threat priorities, terrain data, and weather (moon illumination, contrails, etc). This process will be intensive for stealth platforms.

**ICOM line:** AOR Weather Data

**Glossary Text:** Predicted and current weather conditions in the AOR. This should include hazardous weather activity, winds (surface and winds at altitude), contrail altitude, cloud altitude, moon illumination, sunrise, sunset, moonrise, moonset, sea state, ocean temperature, and solar data.

**ICOM line:** Initialized MPS

**Glossary Text:** The Mission Planning System (MPS) is considered "initialized" once the current map, seasonal weather, airspace, threat, and radar cross section data is input.

**ICOM line:** Planning Timeline

**Glossary Text:** Estimate of planning effort duration of the tasked mission based upon the requested time over target. This includes a detailed schedule for

the mission planning cell as well as planned briefing, step, takeoff time, and recovery times.

**ICOM line:** Threat Constraint Data

**Glossary Text:** The MPC will decide maximum fuel (or range) to be used for the strike routing, set acceptable range for ingress and egress headings, determine width of release corridors, determine maximum weapon bay door open time, and determine threat priorities.

**ICOM line:** Threat Environment Initialized

**Glossary Text:** Mission planning system has weather data and threat constraints set and is ready for route planning.

### **Operational Activity: Determine Weapon Damage Effects**

**Glossary Text:** This process analyzes the target type and location, Probability of Damage (Pd or effects requirements), Circular Error Probable (CEP) and Collateral Damage (Cd) requirements to determine the appropriate weapon/fuze combination. This process will also determine weapon release restrictions (i.e. track, impact angle, etc) and employment tactics (guided, unguided, cruise missile, coordinate only, aircrew aiming required) based on accuracy requirements (circular error probable, Pd, or Cd). Rules of Engagement for each Desired Mean Point of Impact (DMPI) are determined during this process. This process is iterative with the "Plan Target Attack" and "Plan Threat Area Routing" processes.

**ICOM line:** Adjusted DMPItoAircraft

**Glossary Text:** Reallocation of DMPIs to aircraft due to target attack plan. This may change the aircraft SCL.

**ICOM line:** Assigned Target Area

**Glossary Text:** If the tasking organization does not know target location prior to takeoff, the bomber will be assigned a target area of responsibility.

**ICOM line:** DMPI ROE

**Glossary Text:** Rules of engagement established for each DMPI that is tasked. This can include targeting restrictions such as coordinate only authorized or radar look required, release restrictions (impact angle, heading plane, ingress/egress headings, etc), degraded weapon procedures, and fuzing procedures. This should also include allowable contingency options (i.e. allowable impact angle range) for the crew.

**ICOM line:** DMPItoAircraft

**Glossary Text:** Tasked DMPIs (based on associated weapon/fuze combination and desired effects) as assigned to individual aircraft.

**ICOM line:** Final SCL

**Glossary Text:** Loadout that achieves employment objectives and has survivable routing. Includes weapon type, fuze type, fuze setting and weapon location (on the aircraft) assigned to each DMPI. If this SCL is different from what was tasked, the tasking agency must be coordinated.

-This is also the guided/unguided weapon summary.

**ICOM line:** Initial SCL

**Glossary Text:** Approved initial stores configuration based on aircraft, weapon, and fuze availability and JFACC tasking.

**ICOM line:** JMEM

**Glossary Text:** Joint Munitions Effects Manual. Guidance for determining weaponeering solutions versus a variety of target sets.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Mission Aircraft

**Glossary Text:** Number of aircraft that will be used based on mission objectives, aircraft availability, and weapon availability.

**ICOM line:** Planning Timeline

**Glossary Text:** Estimate of planning effort duration of the tasked mission based upon the requested time over target. This includes a detailed schedule for the mission planning cell as well as planned briefing, step, takeoff time, and recovery times.

**ICOM line:** Target Folder

**Glossary Text:** Contains verified DMPI coordinates and target imagery generation (as required).

**ICOM line:** Target Imagery

**Glossary Text:** Target complex and DMPI imagery extracted from target folder amended for the applicable tactics (i.e appropriate look and squint angles) that will be used.

**ICOM line:** Weaponeering Solution

**Glossary Text:** Available weapon/fuze combinations, settings and tactics to meet required Pd and Cd objectives.

### **Operational Activity: Plan Target Attack**

**Glossary Text:** This process examines each target complex (to include imagery products) and determines the appropriate tactics for accomplishing command objectives. Aircraft/weapon survivability will be analyzed during this process with heavy emphasis placed upon high vulnerability periods (i.e. weapon release activities, high bank turns, etc). If required, radar look points will also be determined during this process. If cruise missile attacks are desired or required, their routing will be determined. If the required effect is support jamming, the appropriate orbit area will be determined. This process is iterative with the "Plan Threat Area Routing" and "Determine Weapon Damage Effects" processes.

**ICOM line:** Adjusted DMPItoAircraft

**Glossary Text:** Reallocation of DMPIs to aircraft due to target attack plan. This may change the aircraft SCL.

**ICOM line:** Adjustments to Target Attack Route

**Glossary Text:** Changes to target routing due to threat avoidance maneuvers.

**ICOM line:** Aircraft tactics

**Glossary Text:** Outlines available command approved tactic employment options and procedures for each MWS. This information is documented in the MWS-specific 3-1 volume.

**ICOM line:** Cruise Missile Attack Route

**Glossary Text:** Cruise missile waypoints and altitudes enroute to the target area. This route also includes terminal area maneuvers.

**ICOM line:** Feas/Cap Go/No Go

**Glossary Text:** Leadership decision whether to proceed with mission planning after analyzing contingencies and identifying limiting factors.

**ICOM line:** JFACC Objectives

**Glossary Text:** Weapon effects requirements directed by the JFACC in support of JFC strategy.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Planning Timeline

**Glossary Text:** Estimate of planning effort duration of the tasked mission based upon the requested time over target. This includes a detailed schedule for the mission planning cell as well as planned briefing, step, takeoff time, and recovery times.

**ICOM line:** Target Attack Route

**Glossary Text:** The route required to achieve JFACC required effects. This routing includes optimum weapon release points, release parameters (altitude, speed, heading, etc), and other aircraft tactics (i.e. radar look points, etc) to achieve the required probability of damage/destruction.

**ICOM line:** Terminal Area Model

**Glossary Text:** Terminal Area Model built by intelligence organization that provides terminal guidance for the Joint Air to Surface Standoff Missile.

**ICOM line:** Weaponing Solution

**Glossary Text:** Available weapon/fuze combinations, settings and tactics to meet required Pd and Cd objectives.

### **Operational Activity: Plan Threat Area Route**

**Glossary Text:** The goal of this process is develop the least threat risk routing from the first possible detection point to the last point of possible enemy engagement point along the flight path. Probability of detection and engagement zones will be identified and analyzed. A risk mitigation strategy will be developed to include support asset and aircraft countermeasures requirements. This process will highlight threat vulnerabilities. This process is iterative with the "Plan Target Attack" and "Determine Weapon Damage Effects" processes.

**ICOM line:** Attack Fuel

**Glossary Text:** Fuel required to accomplish the target attack.

**ICOM line:** Countermeasures Required

**Glossary Text:** Required aircraft countermeasures for the anticipated threat.

This includes the appropriate electronic measures software/hardware load as well expendables.

**ICOM line:** Lessons learned

**Glossary Text:** Recommended improvements to all bomber mission planning processes.

**ICOM line:** Planning Timeline

**Glossary Text:** Estimate of planning effort duration of the tasked mission based upon the requested time over target. This includes a detailed schedule for the mission planning cell as well as planned briefing, step, takeoff time, and recovery times.

**ICOM line:** Strike Route

**Glossary Text:** Minimum risk route based on the tactical route. This route achieves the optimal survivability while achieving JFACC objectives.

**ICOM line:** Support Asset Requirement

**Glossary Text:** Request for support assets necessary to mitigate enemy threats. The assets may ground, air, or space based and are tasked to degrade or destroy the enemy air defense system and/or command and control network.

**ICOM line:** Support Assets Available

**Glossary Text:** Air, ground, space, or information platforms made available to help mitigate threat risk.

**ICOM line:** Target Attack Route

**Glossary Text:** The route required to achieve JFACC required effects. This routing includes optimum weapon release points, release parameters (altitude, speed, heading, etc), and other aircraft tactics (i.e. radar look points, etc) to achieve the required probability of damage/destruction.

**ICOM line:** Threat Environment Initialized

**Glossary Text:** Mission planning system has weather data and threat constraints set and is ready for route planning.

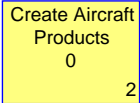
**ICOM line:** Threat Vulnerability

**Glossary Text:** Evaluation of the aircraft vulnerability to enemy threats the strike phase of the mission. This assessment considers time spent in detection and engagement zones of factor threats which could result in a successful enemy engagement.

# Produce Mission Materials



A3.3.1



A3.3.2



A3.3.3

## Diagram Properties for: Produce Mission Materials

Audit ID: afit

### Operational Activity: Create Aircrew Mission Products

**Glossary Text:** This process creates mission materials to be used by the aircrew. These products normally include flight plans, weapon summaries, aim point summaries, bomb run depictions, communication plans, route charts, target imagery, aim point imagery, and refueling summaries. These products are also commonly known as a Combat Mission Folder (CMF).

### Operational Activity: Create Aircraft Products

**Glossary Text:** This process allows the MPC developed routing to be transferred to the aircraft via Data Transfer Device (DTD). In addition to the route; GPSkeys, crypto keys, enemy order of battle, weapons data, target data, aim point data, and communications data will also be transmitted to the aircraft.

### Operational Activity: Create Briefing Products

**Glossary Text:** This process creates briefing materials used by the MPC to succinctly disseminate the plan to leadership or other participating organizations.



## Appendix B, Information Exchange Requirements (OV-3)

UJTL	Info Exchg Identifier	Information Element		Producer		Consumer		Need line Identifier	Nature of			Performance	
		Info Element Name and Identifier	Description	Sending Op Node Name and Identifier	Sending Op Activity Name and Identifier	Receiving Op Node Name and Identifier	Receiving Op Activity Name and Identifier		Transaction	Attributes			
			Content						Triggering Event	Interoperability Level Required	Criticality	Periodicity	Timeliness
	AB1	AB1-Tasking Info	Contains targeting data, time over target, effects requirements, airspace control plan, theater communications plan, rules of engagement, and special instructions.	B/Tasking Organization	B/Provide Mission Tasking	A/Miss Pln Cell	A/Perform CBMPE	1	JFACC Tasking	16	1		Note 1
	AB2	AB2-Constraints	Contains any discrepancies in the tasking data discovered by the MPC or tasking organization objectives that cannot be met. This could include discrepancies in coordinates, weaponeering, number of bomber assets required or rules of engagement.	A/Mission Planning Cell	A/Perform CBMPE	B/Tasking Organization	B/Provide Mission Tasking	1	Discrepancies in tasking order data or inability to meet objectives	12	2		Note 3
	AC1	AC1/Aircrew Requirements	Number and qualifications (letter of Xs) of aircrew required to meet mission objectives.	A/Mission Planning Cell	A/Perform CBMPE	C/Unit Scheduling	C/Provide Aircrew	1	JFACC Tasking	12	1		Note 1
	AC2	AC2-/Aircrew Products	Contains weapons summary, flight plan, refueling (divert) summary, aimpoint summary/graphics, target imagery, charts, target data and plan, order of battle, factor threats, airspace plan, deconfliction plan, contingency plan, go/no go criteria, rules of engagement, special instructions, and to aircrew.	A/Mission Planning Cell	A/Perform CBMPE	C/Unit Scheduling	C/Provide Aircrew	1	Mission Plan complete	12	2		Note 1

UJTL	Info Exchg Identifier	Information Element		Producer		Consumer		Needline Identifier	Nature of			Performance	
		Info Element Name and Identifier	Description	Sending Op Node Name and Identifier	Sending Op Activity Name and Identifier	Receiving Op Node Name and Identifier	Receiving Op Activity Name and Identifier		Transaction			Attributes	
									Triggering Event	Interoperability Level Required	Criticality	Periodicity	Timeliness
	AD1	AD1/Threat Information Files	Aircraft/Weapon threat Radar Cross Section (RCS), Infrared (IR) signature for airborne and ground sensor detection, performance, and electronic parametric data	D/Threat Analysis Organizations	D/Perform External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	1	Periodic or update available	16	3		Note 2
	AE1	AE1/Aircraft Requirements	Number of aircraft required to meet mission objectives. Minimum equipment/maintenance status requirements and initial fuel load to meet mission tasking.	A/Mission Planning Cell	A/Perform CBMPE	E/Maintenance Unit	E/Provide Unit Aircraft	2	JFACC Tasking	12	1		Note 1
	AE2	AE2/Aircraft Products	Route(s) of flight, order of battle, weapons configuration, targeting data, communications channelization, etc.	A/Mission Planning Cell	A/Perform CBMPE	E/Maintenance Unit	E/Provide Unit Aircraft	2	Mission Plan complete	12	2		Note 1
	AE3	AE3/Aircraft Availability	Availability and status of aircraft on station.	E/Maintenance Unit	E/Provide Unit Aircraft	A/Mission Planning Cell	A/Perform CBMPE	2	FeasCap meeting	12	3		Note 2

UJTL	Info Exchg Identifier	Information Element		Producer		Consumer		Need line Identifier	Nature of			Performance	
		Description							Transaction			Attributes	
		Info Element Name and Identifier	Content	Sending Op Node Name and Identifier	Sending Op Activity Name and Identifier	Receiving Op Node Name and Identifier	Receiving Op Activity Name and Identifier		Triggering Event	Interoperability Level Required	Criticality	Periodicity	Timeliness
	AF1	AF1/Briefing Products	Initial view of planned employment, number of aircraft and planned configuration, contingency plans, threat assessment, operational risk assessment, and final route of flight.	A/Mission Planning Cell	A/Perform CBMPE	F/Wing Leadership	F/Provide Unit Leadership	3	Mission Plan complete	12	2		Note 2
	AF2	AF2/Planning Guidance	Overall guidance on the planning and execution of bomber missions. Serves as the baseline for feasibility analysis and go/no go decisions.	F/Wing Leadership	F/Provide Unit Leadership	A/Mission Planning Cell	A/Perform CBMPE	4	Periodic or update available	12	1		Note 2
	AG1	AG1/Mission Route	All factor mission routings produced by the MPC to include altitudes, target areas and mission timing.	A/Mission Planning Cell	A/Perform CBMPE	G/Other MPCs	G/Provide External Mission Support	4	Mission Plan complete	16	3		Note 1
	AG2	AG2/Mission Route	All factor mission routings produced by the MPC to include altitudes, target areas and mission timing.	G/Other MPCs	G/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	4	Request for Route	16	3	Note 3	
	AH1	AH1/Weapons Requests	Weapon required to meet JFACC effects objectives. Includes number of weapons, location on the aircraft (SCL), weapon type, fuze type, and fuze setting.	A/Mission Planning Cell	A/Perform CBMPE	H/Munitions Unit	H/Provide External Mission Support	5	JFACC Tasking	12	1		Note 1
	AH2	AH2/Weapons Availability	Numbers and status of available munitions and fuzes.	H/Munitions Unit	H/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	5	FeasCap meeting	12	3		Note 2

UJTL	Info Exch Identifier	Information Element		Producer		Consumer		Need line Identifier	Nature of Transaction			Performance Attributes	
		Info Element Name and Identifier	Description	Sending Op Node Name and Identifier	Sending Op Activity Name and Identifier	Receiving Op Node Name and Identifier	Receiving Op Activity Name and Identifier		Triggering Event	Interoperability Level Required	Criticality	Periodicity	Timeliness
	A11	AI1/Support Effect Request	Necessary support effects to enable bomber mission that cannot be mitigated using available airborne assets. MPC also sends route of flight and requested effects timing. Effects request is made to the tasking organization and forwarded to the appropriate support unit.	A/Mission Planning Cell	A/Perform CBMPE	I/Ground-based Effects Unit	I/Provide External Mission Support	5	Plan Mission Activities Complete	16	3	Note 3	
	A12	AI2/Availability of Assets	Availability of ground-based support assets. Includes capabilities such as network attack, ship and land based artillery fires, special forces fires, etc. This request would be a request for effects from the MPC to the AOC and the AOC would check available assets and choose the appropriate solution.	I/Ground-based Effects Unit	I/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	5	Support Asset Request	16	3	Note 3	
	AJ1	AJ1/Space Organization	GPS ephemeris and almanac data.	J/Space Organization	J/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	6	Periodic or update available	16	3	Note 2	
	AK1	AK1/Communications Request	Includes LOS frequency requirements, satellite bandwidth requirements, route of flight, and mission times.	A/Mission Planning Cell	A/Perform CBMPE	K/Communications Organization	K/Provide External Mission Support	7	Plan Mission Activities Complete	16	3	Note 3	
	AK2	AK2/Communication Asset Availability	Includes available satellite frequencies and times, bandwidth available, LOS frequency availability, and current GPS and crypto keys.	K/Communications Organization	K/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	7	Communications Request	16	3	Note 3	

UJTL	Info Exchg Identifier	Information Element		Producer		Consumer		Need line Identifier	Nature of Transaction			Performance Attributes	
		Info Element Name and Identifier	Description	Sending Op Node Name and Identifier	Sending Op Activity Name and Identifier	Receiving Op Node Name and Identifier	Receiving Op Activity Name and Identifier		Triggering Event	Interoperability Level Required	Criticality	Periodicity	Timeliness
	AL1	AL1/Area of Responsibility	Geographic region that the MPC is tasked to develop a tactical plan. Includes planned employment altitudes and route of flight. Also includes factor threats.	A/Mission Planning Cell	A/Perform CBMPE	I/Intelligence Organization	I/Provide External Mission Support	8	JFACC Tasking	16	1		Note 1
	AL2	AL2/Order of Battle	Enemy, friendly and neutral orders of battle.	I/Intelligence Organization	I/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	8	JFACC Tasking	16	2		Note 1
	AM1	AM1/Area of Responsibility	Geographic region that the MPC is tasked to develop a tactical plan. Includes planned employment altitudes and route of flight. Also includes factor threats.	A/Mission Planning Cell	A/Perform CBMPE	M/Weather Organization	M/Provide External Mission Support	9	JFACC Tasking	16	1		Note 1
	AM2	AM2/Weather Data	Hazardous weather, winds at altitude and surface, sunrise, sunset, moon illumination, moonrise, moonset, contrail prediction, sea temperature, surface temperature, sea state, etc.	M/Weather Organization	M/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	9	Received AOR	12	3		Note 3

UJTL	Info Exchg Identifier	Information Element		Producer		Consumer		Need line Identifier	Nature of Transaction			Performance Attributes	
		Info Element Name and Identifier	Description	Sending Op Node Name and Identifier	Sending Op Activity Name and Identifier	Receiving Op Node Name and Identifier	Receiving Op Activity Name and Identifier		Triggering Event	Interoperability Level Required	Criticality	Periodicity	Timeliness
	AN1	AN1/EA and Suppression Requirements	Threat and/or communication jamming, destruction of enemy air defenses, or suppression of enemy air defenses requirements. Includes bomber route of flight with associated timing, threat priorities, and requested time of effects.	A/Mission Planning Cell	A/Perform CBMPE	N/EA and Suppression Organization	N/Provide External Mission Support	10	Threat Area Route Planning Complete	12	3		Note 3
	AN2	AN2/EA and Suppression Availability	Availability of airborne electronic attack and suppression assets. Includes ability to produce the desired effects.	N/EA and Suppression Organization	N/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	10	Request for EA/Suppression Effects	12	3		Note 3
	AO1	AO1/Air Refueling Requirements	In-flight refueling requirements to, from, and within the area of responsibility. Onload requirements for each bomber as well as the formation. Geographic location, altitude, and time where air refueling will take place. Communication plan for formation rendezvous.	A/Mission Planning Cell	A/Perform CBMPE	O/Refueling Organization	O/Provide External Mission Support	11	Merged Route	12	3		Note 3
	AO2	AO2/Refueling Asset Availability	Tanker availability, off-load capabilities, and other refueling related constraints (i.e. weather at the tanker launch/recovery base)	O/Refueling Organization	O/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	11	Request for Refueling	12	3		Note 3

UJTL	Info Exchg Identifier	Information Element		Producer		Consumer		Needline Identifier	Nature of			Performance	
		Info Element Name and Identifier	Description	Sending Op Node Name and Identifier	Sending Op Activity Name and Identifier	Receiving Op Node Name and Identifier	Receiving Op Activity Name and Identifier		Transaction			Attributes	
									Triggering Event	Interoperability Level Required	Criticality	Periodicity	Timeliness
	AP1	AP1/Area of Responsibility	Geographic region that the MPC is tasked to develop a tactical plan. Includes planned employment altitudes and route of flight. Also includes factor threats.	A/Mission Planning Cell	A/Perform CBMPE	P/GI&S Organization	P/Provide External Mission Support	12	JFACC Tasking	16	1		Note 3
	AP2	AP2/Mapping and Charting Data	Current CADRG, DTED, DAFIF, imagery, NITF, GIF, and GEOTIFF products.	P/GI&S Organization	P/Provide External Mission Support	A/Mission Planning Cell	A/Perform CBMPE	12	Received AOR	12	3		Note 2

KEY

Criticality

- 1 = Category 1 Mission Critical (Force C2)—Critical and high-level information (e.g., emergency action message and commander's guidance)
- 2 = Category 2 Mission Critical (Mission Operations)—Required in support to operations (e.g., joint task force contingency plans and operations plan)
- 3 = Category 3 Mission Critical (Core Functions)—Ongoing information exchanges (e.g., configuration and guidance information and restricted frequency list)
- 4 = Mission critical [not otherwise specified]

Interoperability

- 01 = Level 0—Isolated Level (Manual), without sublevel distinction
- 07 = Level 1—Connected Level (Peer-to-Peer), without sublevel distinction
- 12 = Level 2—Functional Level (Distributed), without sublevel distinction
- 16 = Level 3—Domain Level (Integrated), without sublevel distinction
- 20 = Level 4—Enterprise Level (Universal), without sublevel distinction

- 5 = Mission support—Logistics, transportation, medical (e.g., gallons

of petroleum-oil- lubrication scheduled for delivery)

- 6 = Administrative—Personnel, pay, training, etc. (e.g., change in allotment)

Note 1: Real-time access - data owners are required to post updates to their products in a location readily accessible to the mission planning cell. Additionally, the data management system must let the mission planning cell know when data updates are available.

Note 2: Periodic access - real time access to information to the MPC is not required. Data/Information in this category either changes at a predictable or is needed at predictable times in the process. Data and information owners need only release data and information to the mission planning cell on a pre-agreed upon frequency unless extenuating mission factors or changes make timeliness more critical.

Note 3: Response based access - the mission planning cell triggers data/information transfer with a request. Data/information owners are required to provide responses/alibis at a pre-agreed upon frequency or as soon as it becomes available whichever comes first.

Note 4: All data in general needs to be in a highly transportable (across several different types of systems) and flexible format. This data needs to be able include not only the data, but also descriptions of the data and security requirements of the data. For software based systems, heirarchical databases (XML) seems like the best format to facilitate these requirements though a relational database may also be suitable. By adhering to XML schema, data names, allowable hierarchy, and meanings of the data elements and attributes can be open and definable.

Purpose: To show top level attributes of the data exchanged between operational nodes.  
Viewpoint: Mission Planning Cell



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<b>REPORT DOCUMENTATION PAGE</b>				<i>Form Approved OMB No. 074-0188</i>	
<p>The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p> <p><b>PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.</b></p>					
<b>1. REPORT DATE (DD-MM-YYYY)</b> 13 06 2006		<b>2. REPORT TYPE</b> <b>Graduate Research Project</b>		<b>3. DATES COVERED (From – To)</b> Jan – Jun 2006	
<b>4. TITLE AND SUBTITLE</b> Requirements For Common Bomber Mission Planning Environment				<b>5a. CONTRACT NUMBER</b>	
				<b>5b. GRANT NUMBER</b>	
				<b>5c. PROGRAM ELEMENT NUMBER</b>	
<b>6. AUTHOR(S)</b> Major Samuel G. White III				<b>5d. PROJECT NUMBER</b>	
				<b>5e. TASK NUMBER</b>	
				<b>5f. WORK UNIT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAMES(S) AND ADDRESS(S)</b> Air Force Institute of Technology Graduate School of Engineering and Management (AFIT/ENS) 2950 P Street, Building 640 WPAFB OH 45433-7765				<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b> <b>AFIT/IC4/ENG/06-08</b>	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> Maj Tim Barclay B2SG/VA, Building 556 2690 Loop Road West Wright Patterson AFB, OH 45433 DSN 785-9445, Commercial (937) 255-9445				<b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>	
				<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b>	
<b>12. DISTRIBUTION/AVAILABILITY STATEMENT</b> APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED.					
<b>13. SUPPLEMENTARY NOTES</b>					
<b>14. ABSTRACT</b> The mission planning environment for the strategic bomber is characterized by numerous few man-to-machine relationships, data flows and organizational interactions. Currently, these activities are accomplished by several mechanisms using a variety of data formats. Several tools have been developed to address the complexity of not only bomber mission planning, but tactical (unit) level mission planning as a whole. Unfortunately, many of these initiatives have fallen short of seamlessly connecting the tactical level mission planning processes with the operational level or providing the unit-level mission planner with the right information, in the correct format, at the right time. One of the major reasons these initiatives fail is the developers of tactical mission planning systems do not completely understand the business rules, data exchanges and activities that compromise the bomber mission planning process. Through structured architecture, this paper discovered a general set of bomber mission planning environment requirements, common to all bomber Major Weapon Systems (MWS), at the tactical level. During the analysis process, several observations were made which require more consideration during future requirements development and/or mission planning system acquisition.					
<b>15. SUBJECT TERMS</b> Mission planning, Joint Mission Planning System (JMPS), Common Mission Planning Environment, bombe, Air Force Mission Support System					
<b>16. SECURITY CLASSIFICATION OF:</b>			<b>17. LIMITATION OF ABSTRACT</b>  UU	<b>18. NUMBER OF PAGES</b> 106	<b>19a. NAME OF RESPONSIBLE PERSON</b> <b>Dr. Robert F. Mills, ENG</b>
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			<b>19b. TELEPHONE NUMBER (Include area code)</b> (937) 255-6565, ext 4527
				<b>Standard Form 298 (Rev. 8-98)</b> Prescribed by ANSI Std. Z39-18 <i>Form Approved OMB No. 074-0188</i>	