C.1.0 APPENDIX C - INTERDICTION MISSION AREAS, DESCRIPTION OF CURRENT SYSTEM OR SITUATION

Interdiction mission elements addressed in this appendix include the following mission types.

- Close Air Support (CAS)
- Forward Air Control (Airborne) (FAC(A))
- Strike Coordination and Reconnaissance (SCAR)
- Armed Reconnaissance (RECCE) -Search and Destroy
- Suppression of Enemy Air Defense (SEAD)
- Deep Air Strike (DAS)
- Surface Warfare (SUW)
- Maritime Air Support (MAS)

CAS is characterized as air action by fixed and rotary-wing aircraft against hostile targets which are in close proximity to friendly forces and which require detailed integration of each air mission with the fire and movement of those forces (see also air interdiction; air support; immediate mission request; preplanned mission request).

FAC(A) is characterized as an officer (aviator/pilot) member of the tactical air control party who, from a forward ground or airborne position, controls aircraft in close air support of ground troops.

SCAR is a mission flown for the purpose of acquiring and reporting DAS targets, and coordination of air interdiction or armed reconnaissance mission upon those targets. SCAR is used to locate known or suspected DAS targets and assist in their destruction. SCAR provides an aviation deep battlefield manager who can assist flight leaders within a specified area or route. SCAR is especially useful in target rich environments to prevent redundant air strikes, and can be used to expedite the flow of DAS aircraft into and out of a target area. The SCAR mission can be used to verify preplanned target locations, discriminate between actual and deceptive targets, or monitor the movement of mobile systems.

An Armed RECCE mission is designed to destroy targets of opportunity, with a secondary mission of attacking specific fixed targets if no target of opportunity presents itself. The objective is the same as that of an interdiction (DAS) mission, as are the targets. Armed reconnaissance, however is generally planned for a specified route or area, and weapons loads may be tailored to attack moving or movable targets. DAS is characterized as an attack on specific objectives by fighter, bomber, or attack aircraft on an offensive mission and may consist of several air organizations under a single command in the air. The following sections discuss the current mission planning process for a Tactical Air (TACAIR) strike aboard a aircraft carrier (CV), deficiencies and limitations, and concepts for a new or modified approach for these mission elements. The process is similar for Navy and Marine units ashore, although some terms and specifics may be different.

Any platform that can carry ordnance can conduct SUW and MAS (i.e.. FA-18, F-14, S-3, Joint Strike Fighter (JSF), etc.).

SUW is characterized as the effective conduct of surveillance. reconnaissance and the engagement of all hostile surface threats prior to reaching their maximum effective weapons release range. SUW operations will be governed by the concept of defense in depth, but will focus on offensive SUW versus a littoral threat and the need to conserve resources by allocating minimum assets to successfully counter the threat. When time is available, planning for maritime strikes should follow power projection (DAS) procedures.

MAS is conducted by any available and suitably loaded aircraft in order to provide a rapid response. MAS procedures are more closely aligned with Offensive Air Support (OAS) and CAS missions and are the evolutionary follow-on to Sledgehammer, Screaming Eagle, War-at-Sea exercise (WASEX) and Maritime Air Support Operations Center type tactics designed to counter immediate threats and targets of opportunity. Procedures are applicable for Joint Maritime Operations (Air) assets providing maritime air support. Primary consideration is rapid response to counter hostile contacts closing the force.

An ATO to conduct an interdiction mission is generally promulgated the day before a proposed strike. However, verbal tasking is usually received from the Carrier Air Group (CAG) OPS anytime from a day up to a week prior to receipt of the actual ATO. The ATO designates the target, its coordinates, the number of aircraft allocated to the mission, the ordnance required to achieve mission objectives, non-organic tanker location(s) including fuel allotment and communication, reporting procedures for the mission, and an assigned time on target for all participants. If a major airwing strike is directed by the CAG rather than ATO tasking, then target information is usually the only data provided to the strike leader. The strike leader must determine the remaining information during the strike planning process. The process of planning such a strike is explained below.

The Strike Lead designated by CAG, proceeds to the Carrier Intelligence Center (CVIC) to review the tasking/target and preliminary threat data in order to formulate a general idea about the strike. The Strike Lead gets the strike team together (often already designated in writing by CAG) in CVIC and they brainstorm as to the best way to achieve the mission objectives. Once they have reached some consensus, the Strike Lead assigns specific areas of responsibility to each member of the team and gives them a deadline to get a preliminary plan with timelines back to him. Each member goes to the applicable source(s) to obtain all the information needed to complete the assigned input to the planning evolution; this is often a laborious and time consuming process.

The Strike Lead correlates the collected inputs and prepares a short (5-10 minute) brief for the CAG. This “CAG laptop” provides an overview of mission requirements, including the identification of any external asset support, if required. CAG provides amplifying direction during this brief and assesses both the feasibility of the plan, and directs what changes need to be made. Sometimes the Battle Group Commander asks to be briefed, as well. This briefing is normally presented in the same style as the CAG laptop and can be requested at any time in the planning process.

After briefing CAG, the strike team reassembles in CVIC, discusses any alterations, and assigns subsequent efforts. The Strike Leader then tasks individual members to provide specific data with another deadline, compiles these inputs and prepares a comprehensive brief. This presentation is generally complete with photos of the target area, weather, radar/sensor predictions, snapshots

and a diagram of the "flow" of the strike. This is the "mass brief" that will given to all members of the strike.

The mission is briefed by the Strike Lead with all the participants present (generally about 45 minutes). Kneeboard cards are handed out and reviewed before the brief to ensure correctness. After the brief, the players break down into different elements (i.e. Air-to-Air brief, Air-to-Ground, Electronic Warfare-EW, etc.). This usually encompasses another 30-45 minutes. After that, they break down further into their individual elements for their flight briefs, which takes 15-30 minutes.

Aircraft are loaded with the data on preflight and the mission is flown. When individual aircraft return, the flight crews go through CVIC to debrief Intelligence personnel on the mission and present any available Battle Damage Assessment (BDA)/Bomb Hit Assessment (BHA) video. They then meet as a flight, conduct a mini-element debrief before the mass debrief. Within an hour after the strike has returned, a mass debrief is conducted with the element leads of the strike. Any BDA/BHA is reviewed, the mission is recreated on a white board, and derived "lessons learned" and reports are distributed, as necessary. The Battle Group Commander and/or CAG may be in attendance during the debrief.

C.1.1 TASKING

The primary source of mission tasking is the ATO. Tasking can also be generated in-house by the Battle Group Commander or CAG. When tasking is received via the ATO, applicable strike missions are identified and CAG assigns them to a pre-designated strike team. This procedure also applies for in-house generated missions. Strike team leaders are often given advance notice of pending tasking and are able to start initial planning prior to official receipt of tasking

C.1.2 RESEARCH AND STUDY

C.1.2.1 Mission Analysis

The tasking for ATO missions is received via a paper ATO, Contingency Theatre Automated Planning System (CTAPS), Carrier On-board Delivery (COD) or S-3. In order to pinpoint the mission requirements, the first item to consider is the ground scheme of maneuver. Factors to consider are whether the Ground Combat Element (GCE) is in a fluid maneuver environment or defending an area, whether the ground forces are facing a sophisticated mechanized threat or light infantry, whether there are troops to consider, target area to include key terrain features and the overall mission objectives.

C.1.2.2 Threat Analysis

The next step is to analyze in detail, the threats to the mission. Threat analysis requires detailed information be provided on all of the threats encountered during the mission by the intelligence officer. Intelligence (INTEL) should be able to provide the following:

a. Locations of fixed Surface-to-Air Missile (SAM)/Anti-Air Artillery (AAA) systems,
b. General locations and status of mobile SAM/AAA systems,

c. Threat density for regimental and battalion air defense system assets, such as SA-7/9/13/14 or ZSUs,
d. Expected deployment of mobile SAM/AAA systems,
e. Depict acquisition and engagement envelopes for all threats,
f. Location of threat airfields and their alert status, and
g. Location of threat Naval forces and their capabilities.

Currently, the threat locations come from the Intel department, and are plotted on paper charts. Several systems, such as the Tactical Automated Mission Planning System (TAMPS), Tactical Strike Coordination Manager (TSCM), Joint Maritime Command Information System (JMCIS), have the capability to plot and analyze threats, but are seldom used because they are too cumbersome to use, slow, and often unreliable.

C.1.2.3 Evaluation of Environmental Factors

Weather data must be obtained and reviewed to make a determination of the effects of cloud ceiling and visibility on the planned ingress/egress tactics and various delivery options. Sun angle and forecast data for shading effects on the target area must also be obtained. Surface winds must also be considered for their effects on the target acquisition, laser employment, and bomb damage assessment. Also, Electro-Optical Infrared (EOIR) is analyzed with Metro's Electro-Optical Tactical Decision Aid (EOTDA) program to predict what the target picture might be with the forecasted conditions with all possible sensors that might be used.

Currently this data comes from the Metro, in the form of a verbal brief, and sometimes in the form of a fax or other electronic transmission.

C.1.2.4 Conduct Target Area Study

After examining the mission, threats, and weather, the strike team then conducts a detailed map and target area image study. Ideally, it is best to work big to small, e.g. 1:500K chart (Tactical Piloting Chart-TPC) for general Area familiarization, 1:250K Chart (Joint Operations Graphic-JOG) for further examination of your specific operation area, 1:50K (Topographic Line Maps-TLM) for study of the Initial Point (IP) to target routing and the target area itself.

Additionally, imagery needs to be obtained for the target area. This is usually contained in a target folder with the Basic Encyclopedia (BE) numbers and target descriptions. That package is prepared ahead of time by the INTEL officer.

Imagery is used to determine the terrain features associated with all planned waypoints. Particular attention should be given to the locations of all Forward Edge of the Battle Area (FEBA)/Forward Line of Own Troops (FLOT), Fire Support Coordination Line (FSCL), Airspace Control Authority (ACA) and No-Fire Areas (NFAs).

C.1.2.5 Weaponeering

Mission planners should take an active interest in ordnance planning for strike operations in combat. By insuring familiarity with the ground scheme of maneuver, and threats, one can anticipate the types of targets tasked to be destroyed.

There are two programs that are used in this phase: Target for attack planning and Automated Tactical (Manual Supplement) (ATACS) for F/A-18 for stores planning.

C.1.2.6 Attack Axis

Attack axis is dictated by Tactical Air Control Party (TACP) constraints, target orientation, environmentals, geographics, threat, ground order of battle, friendlies and/or laser to target axis/line of sight.

C.1.2.7 Dive Angle

A greater number of tactical options here are available with dive angle. Dive angle is predominantly determined by weaponeering and is a function of frag pattern, threat avoidance, time of fall, laser line of sight, desired impact angle and weather.

C.1.2.8 Release Altitude

Release altitude is a trade-off between target acquisition/accuracy and threat avoidance. A minimum release altitude for all planned dive angles, which will ensure adequate time of fall for fuzing and/or terrain/frag avoidance, must be determined. The TARGET program can be used to determine dive angle and release Altitudes.

C.1.2.9 Frag Avoidance and Separation

Frag avoidance is determined by release altitude and is managed by staying above the frag pattern or deconflicting entry in the multi-plane arena with timing or space/altitude. The CAS 9-Line brief provides an egress direction and a Control Point (CP) for all CAS missions. For other missions, detailed mission planning ensures a degree of safety in the target area. During the planning phase the following must be considered:

- Backup delivery procedures that can be quickly communicated case the situation changes (threat or weather)
- Re-attack execution

C.1.2.10 Off-Target Maneuvers

Off target maneuver are utilized for flight regrouping, laser line-of-sight, threat avoidance and BDA/BHA. Off target considerations consist of some of the following.

- Off-target maneuver dependent on the expected threat
- Avoiding predictable arcing turns in the target area
- Expendable employment
- Egressing as a single aircraft or as a flight
- The relation of our final attack heading with the FEBA

C.1.2.11 Study Communications Plan

Familiarity with communications, tactical, fragged and personnel call signs, frequencies used, and a coherent plan to channelize these frequencies in sequence are required. These include:

- TAOC
- DASC
- TAC(A)
- FAC or FAC(A)
- Local communications procedures
- Diverts and emergency freqs
- CV and Battlegroup freqs

It is also necessary to access the Operations Plan (OPLAN) and the Special Instructions (SPINS) and write down or memorize all applicable brevity code words and to understand "chattermark" and Identification Friend or Foe (IFF) procedures. Aircraft with HAVEQUICK capable radios will need to program the channels that will be used during the mission.

C.1.2.12 Study the Fragged Routing

Plot all checkpoints (Tactical Control Point (TCP), Egress Control Point (ECP),CPs, IP, etc.) and indicate on the chart or kneeboard card the assigned altitude for each point or leg and determine appropriate ingress airspeeds. Finally, using the current mission planning system, build a CP/IP Matrix, that shows time/heading/distance between CPs and IPs, for CAS missions. A timeline will also be created from Time on Target (TOT) backwards to launch time to coordinate the efforts of other missions that may be included in the strike (ie. High Speed Anti-Radiation Missile (HARM), Jamming, Air Support, Tanking, etc.). Assure backup entry, exit and control points are loaded for alternate missions and routing as determined by the Airspace Control Order (ACO).

C.1.2.13 Scenario Examination and Mission Rehearsal

After the routing has been studied, the Strike Leader looks at all possible contingencies and comes up with alternate game-plans. The route may be flown on Tactical Operational Preview Scene (TOPSCENE) or on TAMPS in two-dimensional (2D) rehearsal mode to point out any anomalies. Contingency planning is then conducted to include:

- Go/no-Go criteria (to include minimum # of aircraft to complete mission)
- Aircraft fallout
- Spare use
- Emergencies
- Aircraft malfunctions
- Tactical Recovery of Aircraft and Personnel (TRAP)/Combat Search and Rescue (CSAR)
- Divert Airfields

C.1.2.14 Produce Data Loads

Producing a data load primarily consists of loading waypoints, avionics settings, radar presets, Global Positioning System (GPS) weapons data, HARM Electronic Intelligence (ELINT) files, etc. and other navigation data into a Data Transfer Device (DTD)/Memory Unit (MU).

This is done with TAMPS and Navy-Portable Flight Planning System (N-PFPS) for F/A-18 and CANDIS for AV-8B.

C.1.3 CAS

There are two types of CAS: Preplanned and Immediate. The following paragraphs detail the aspects of preplanned and immediate CAS.

C.1.3.1 Preplanned CAS

A preplanned CAS mission is one that is anticipated with sufficient advance warning to permit detailed mission coordination and planning. A Preplanned CAS mission is further sub-categorized as SCHEDULED or ON CALL.

C.1.3.1.1 Scheduled Preplanned

Scheduled missions are preplanned and executed so as to arrive on target at an assigned TOT. There is not much difference between this and a large multiple aircraft strike plan for DAS. The numbers of assets are just reduced with the CAS mission.

C.1.3.1.2 On Call Preplanned

On call missions are preplanned missions where aircraft are loaded with a particular type of ordnance designed for use against a particular target. The aircraft can also be loaded with a dissimilar load to handle a myriad of targets. The aircraft and aircrew are then placed on alert status with the mission being launched and executed at the request of the supported unit. Detailed mission planning similar to Scheduled Preplanned CAS should be possible.

C.1.3.2 Immediate CAS

An immediate CAS mission is defined as an air strike on a target, which has not been identified sufficiently in advance to permit detailed mission coordination or planning. These missions are executed in response to requests by the GCE. Urgency may require that aircraft be diverted from preplanned missions. Mission coordination is normally conducted via radio just prior to, or immediately following aircraft launch.

C.1.4 FORWARD AIR CONTROL

C.1.4.1 Mission Analysis

The tasking for ATO missions typically comes on a paper ATO, over CTAPS, via COD or S-3. In order to pinpoint the mission requirements, the first item to consider is the ground scheme of maneuver. Factors to consider are whether the GCE is in a fluid maneuver environment or

defending an area, whether the ground forces are facing a sophisticated mechanized threat or light infantry, whether or not there are troops to consider, target area to include what are the key terrain features involved and the overall mission objectives and what are the key terrain features involved.

The following information should be identified and made available to all FAC(A) aircrews prior to their flights:

- CAS Routing
- Helo Routing
- Control Points
- Air Defense Condition
- Air Defense Measures
- CAS missions during Time on station
- SEAD Standard Operating Procedures (SOP) & Plan
- Friendly/Enemy Order of Battle
- Target List
- Target Precedence List
- Fire Support Coordination Measures
- Fire Support Assets and location
- Laser Employment Plan
- Frequencies

This data is primarily provided on paper product, and may come from CTAPS.

C.1.4.2 Brief the Mission

The FAC(A) brief may be done in person, remotely, or at arrival on station.

C.1.4.3 Produce Data Loads

This primarily consists of loading waypoints, avionics settings, radar presets, GPS weapons data, HARM ELINT files, etc. and other navigation data into a DTD.

This is done with TAMPS and N-PFPS for F/A-18 and CANDIS for AV-8B.

C.1.5 STRIKE COORDINATION AND RECONNAISSANCE

C.1.5.1 Analyze the Mission

In order to pinpoint the mission requirements, the first item to consider is the ground scheme of maneuver. The following information should be identified and made available to all SCAR aircrews prior to their flights:

- DAS Routing

- Control Points
- Air Defense Condition
- Air Defense Measures
- DAS missions during time on station
- SEAD SOP & Plan
- Friendly/Enemy Order of Battle
- Target List
- Target Precedence List
- Laser Employment Plan
- Frequencies

This data is primarily provided on paper product, and may come from CTAPS.

C.1.5.2 Target Area Tactics

Targeting and weaponeering requirements depend on the contents of the ATO. The ATO can contain complete targeting and weaponeering information including the target definition, time on target, the number and type of aircraft, the number and type of weapons, attack heading, the desired probability of damage, and route description that deconflicts with other theater activities. On the other extreme, the ATO may only assign a mission number and type of aircraft to the target, allowing the Airwing to determine the best suitable weapon. The Airwing also provides input to the Joint Forces Air Component Commander (JFACC) while the ATO is being developed.

The Airwing Targeting Officer is particularly important to this phase of strike planning. Depending on the detail provided in the ATO, the Targeting Officer is expected to access imagery of the target, perform critical node analysis to achieve the desired results, select aimpoints, weaponeer the target solution, annotate imagery to display aimpoints, attack headings, and other information useful to the delivery crew(s) (i.e., produce a visual target aid (VTA)), and, prepare a hardcopy target folder for the Strike Leader.

On carriers configured with the Joint Sevices Imagery Processing System-Navy (JSIPS-N), the Targeting Officer accesses available target imagery products that are stored in the JSIPS-N archive. Carriers without JSIPS-N, access archives imagery through the JMCIS. On JSIPS-N equipped ships, the Targeting Officer, using the Precision Targeting Workstation (PTW), performs the analysis required to determine the most effective aimpoints. Aimpoints can also mensurated using either the PTW or the Digital Imagery Workstation Suite (DIWS) on the imagery, deriving precise and accurate aimpoint locations. If suitable imagery is not available, the Imagery Officer needs to request collection through the supporting Joint Intelligence Center (JIC). JSIPS-N provides the capability to receive new imagery as it collected. It is not reasonable to expect the Airwing Targeting Officer to target and weaponeer all targets assigned to an Airwing.

C.1.5.3 Brief the Mission

The SCAR brief may be done in person, remotely, or at arrival on station.

C.1.6 ARMED RECCE

C.1.6.1 Mission Analysis

The tasking for ATO missions typically comes on a paper ATO, over CTAPS, via COD or S-3. In order to pinpoint the mission requirements, the first item to consider is the ground scheme of maneuver. Factors to consider are whether the GCE is in a fluid maneuver environment or defending an area, whether the ground forces are facing a sophisticated mechanized threat or light infantry, if there are troops even to consider, target area, to include what are the key terrain features involved and the overall mission objectives and what are the key terrain features involved.

Often a "kill box" or area of responsibility is briefed and the flight will be responsible for anything within that area. No specific targets may be briefed and it's up to the planner to determine tactics and weapons. The mission is not very planning intensive.

The following information should be identified and made available to all Armed RECCE aircrews prior to their flights.

- CAS Routing
- Helo Routing
- Control Points
- Air Defense Condition
- Air Defense Measures
- CAS missions during Time on station
- SEAD SOP & Plan
- Friendly/Enemy Order of Battle
- Target List
- Target Precedence List
- Laser Employment Plan
- Frequencies

This data is primarily provided on paper product, and may come from CTAPS.

C.1.6.2 Targeting/Weaponeering

Since the types of targets that this mission could go against could change while airborne, a dissimilar load is often planned. This requires a knowledge of what targets the package could come up against and then those targets are weaponeered with Joint Munitions Effectiveness Manuals (JMEMs) manuals or Joint Analytic Worldwide Systems (JAWS).

C.1.6.3 Target Area Tactics

Again, the various target types force the planner to be ready for different types of deliveries. Weather, threat, target size/visibility, frag avoidance and terrain are all factors in what tactic might be used. The flight could possibly have numerous types of deliveries planned for all contingencies and weapons.

C.1.7 SUPPRESION OF ENEMY AIR DEFENSE

C.1.7.1 Tasking

The tasking for ATO missions typically comes on a paper ATO, over CTAPS, via COD or S-3. It can also be a mission assigned to a flight within a larger strike.

C.1.7.2 Target/Weaponeering

Threats are usually weaponeered for Hard Kill with Soft Kill as a back-up. The goal can be to deny the enemy use of its SAM systems by physically taking them out with HARM (or some other stand-off weapon, like the Joint Stand-Off Weapon-JSOW) or by forcing the operators to shut down their systems to prevent being targeted.

CVIC/INTEL will provide types and locations of the SAM systems, plus any pertinent info on how the system has been seen to operate in the past and currently (ie. war reserve modes) to the SEAD team. The threats are then compared to the strike route and target area to see which SAMs will be factors. The SEAD team then dissects these systems to provide ELINT info for HARM planning and Jamming planning. The major mission planning system for this is Tactical EA-6B Mission Planning System (TEAMS) for the EA-6B. The F/A-18 community utilizes a personal computer (PC)-based HARM planner for HARM planning and then transfers that data to TAMPS for loading.

If a standoff weapon is utilized (JSOW) then a pre-strike SEAD mission might be planned. JMEMs manuals and JAWS programs would be utilized to determine numbers of required weapons for the desired kill.

C.1.7.3 Target Area Tactics

To protect the strike package with HARM, missiles should be coming down on the SAM systems during the time that the package is in the threat envelope. This either kills the SAM systems or forces them to shutdown and thus, the package is protected. The SEAD team takes the package time in the envelope and plans out a HARM timeline to include launch points, launch times and impact times.

C.1.8 DEEP AIR STRIKE

C.1.8.1 Tasking

Planning the attack mission involves a variety of activities in targeting, weaponeering, target study, target area tactics, and bomb damage assessment. Targeteering involves evaluating the

vulnerabilities of an adversary's military, political, and economic systems and determining the effects of loss or impairment to these systems. Data from a wide variety of intelligence sources support targeteering and enable the most effective use of resources in defeating an adversary. Intelligence personnel gather target data continually and activate intelligence collection assets to fill in data shortfalls. Quick input from BDA assets is also critical to the efficient use of resources and risk minimization.

Weaponeering involves determining the best weapon to employ in the most efficient quantity to achieve an objective damage level on a target. Weaponeering considers target construction and materials, and weapon capability, reliability, accuracy, and delivery parameters. Often weaponeering plans are severely restricted by collateral damage concerns. The nuclear aircraft carrier (CVN) engineering support to reconfigure the aircraft with the desired weapons loadout must also be scheduled.

During the strike, target area tactics include envelope avoidance, stand-off, altitude sanctuary, expendable usage, Electronic Protection (EP) techniques, terrain masking and high speed to minimize threat exposure. Deconfliction is coordinated by altitude, geographic location, time, or weapon selection. Variance in time-on-target and delivery maneuvers is important to avoid blast fragment patterns. Before egress, BDA/BHA is also gathered.

The following subsections describe the activities associated with developing detailed attack plans.

C.1.8.2 Targeting/Weaponeering

Targeting and weaponeering requirements depend on the contents of the ATO. The ATO can contain complete targeting and weaponeering information including the target definition, time on target, the number and type of aircraft, the number and type of weapons, attack heading, the desired probability of damage, and route description that deconflicts with other theater activities. On the other extreme, the ATO may only assign a mission number and type of aircraft to the target, allowing the Airwing to determine the best suitable weapon. The Airwing also provides input to the JFACC while the ATO is being developed.

The Airwing Targeting Officer is particularly important to this phase of strike planning. Depending on the detail provided in the ATO, the Targeting Officer is expected to access imagery of the target, perform critical node analysis to achieve the desired results, select aimpoints, weaponeer the target solution, annotate imagery to display aimpoints, attack headings, and other information useful to the delivery crews (i.e., produce a VTA), and prepare a hardcopy target folder for the Strike Leader.

On carriers configured with the JSIPS-N, the Targeting Officer accesses available target imagery products that are stored in the JSIPS-N archive. Carriers without JSIPS-N access archives imagery through the JMCIS. On JSIPS-N equipped ships, the Targeting Officer, using the PTW, performs the analysis required to determine the most effective aimpoints. He can also mensurate those aimpoints using either the PTW or the DIWS on the imagery, deriving precise and accurate aimpoint locations. If suitable imagery is not available, the Imagery Officer needs to request collection through the supporting JIC. JSIPS-N provides the capability to receive new imagery as it collected. It is not reasonable to expect the Airwing Targeting Officer to target and weaponeer all targets assigned to an Airwing. During CVW-3's recent experience while embarked on the

USS Roosevelt (CVN-71), the targeting functions were performed in the Advanced Planning System (APS) spaces by a team composed of the Strike Leader, the Targeting Officer, the PTW Operator, and the Weaponeering Officer. Other Airwings have standing weaponeering teams designated to perform the weaponeering functions. The available weaponeering tools include PC-based applications based on JMEM models and algorithms (JAWS). In each case, a hardcopy target folder is generated for the Strike Leader as described above.

C.1.8.3 Target Area Tactics

Target area tactics are derived from making tradeoffs among exposure to the enemy air defense systems, predicted target weather, and the weapons delivery parameters required to achieve the desired level of damage. The F/A-18 community uses a tool called the ATACS. ATACS is a PC-based software application manual providing pull-up points, roll-in points, dive angles, delivery and release parameters, minimum release intervals, and minimum release altitudes. Attack formations, timing of strike elements over the target, and off target maneuvering are determined by the Strike Leader. Assignment of data link frequencies for the various man-in-the-loop weapon systems must also be defined and briefed by the Strike Leader.

C.1.8.4 Target Study

The primary aid for target area familiarization is the target folder, which is generated by the Airwing Targeting Officer (in coordination with other members of the strike planning team) using JSIPS-N. The visual target aid in the target folder includes (1) the aimpoint locations with associated accuracy statements, (2) orientation to North, (3) terrain features useful for orientation in the target area (e.g., funneling features, significant landmarks, etc.), and (4) restrictions or no-drop areas (e.g., collateral damage considerations). Additional images archived in JSIPS-N are used to provide views of the target from oblique angles, during different times of day, as seen by various sensors, and during different seasons. Radar predictions can be derived using TAMPS. Forward Looking Infrared (FLIR) prediction is currently a manual process, but the EOTDA provides information concerning atmospheric effects on laser, infrared (IR), and television- (TV) guided systems. EOTDA requires the input of 17 current or predicted weather parameters that are provided by the ship's aerographers. Metro’s EOTDA program is used more often because of TAMPS’ EOTDA is not as reliable or accurate. Additionally, the Solar/Lunar Almanac Prediction (SLAP) database, available through TAMPS, provides information for planning the use of night vision devices. Rehearsal of final strike tactics can be conducted on TOPSCENE if the appropriate target area model (created off ship) and route are available.

C.1.8.5 Bomb Hit/Impact Assessment

During theater operations, the carrier's intelligence center is required to provide a summary of video from each day's operations to the theater commander within 24 hours. There are a variety of formats for recording video images during the conduct of strike operations. The three primary formats are Umatic, VHS, and 8 millimeter (mm) tape. During a recent deployment, CVW-3 experienced much difficulty in collecting the video and converting it to one format for delivery. To aid in this process, they designed and built a rack containing monitors, two VHS systems, a Umatic system, and an 8mm tape system. Using this rack of equipment, they were able to

efficiently produce a VHS cassette containing that day's collection of video. As this rack was acquired with Naval Air Forces U.S. Atlantic Fleet's (AIRLANT's) help, it is anticipated that it will be part of the standard CVIC configuration. The VHS cassette was flown to the theater commander on the first launch the following day. CVW-3 later determined that the embarked Battlegroup Commander's video teleconferencing facility could be used to transmit the video, and with his permission, the video was transferred electronically rather than by aircraft for the remainder of the operations.

C.1.8.6 Egress/Tactics

Tactics and egress procedures from the target area are planned using TAMPS and in accordance with CVW or Squadron Tactical Notes (TACNOTES) and Tactical Procedures (TACPROS). Hardcopy TACNOTES and TACPROS are generally available in CVIC to aircrew and are summarized on kneeboard cards for the purpose of in-flight reference. Off-target tactics, including fighter support, altitudes, formations, speeds, communication plans, and Strike and Element Leaders determine jamming procedures. They are briefed prior to manning the aircraft and are generally made available to aircrew on printed or handwritten mission kneeboard cards. Egress routes, planned on TAMPS as part of the overall mission, as well as coast out points, safe areas, and positions of friendly support aircraft, are hand-drawn on charts for viewing by strike participants and for purposes of route deconfliction.

C.1.9 MAS

To conduct effective MAS, the following conditions are essential, however urgent force defense may preclude obtaining all of the following.

a. Local air superiority
b. Local suppression of enemy air defenses
c. Means to identify target to aircrew
d. Weather conditions acceptable for target acquisition and weapons employment
e. Prompt response
f. Appropriate ordnance
g. Communications
h. Command and Control

The decision to launch on an alert or divert an appropriately loaded aircraft from a different mission to fulfill a maritime air support request is based on response time and urgency of the threat. The following should be used in determining the method of SUW/MAS force employment.

C.1.9.1 Preplanned Missions

Preplanned missions are conducted in accordance with a program planned advance of operations. Preplanned missions consist of scheduled airborne or ground/shipboard alert aircraft or tailored responses to an anticipated threat.

C.1.9.2 Immediate Missions

Immediate missions are conducted to meet specific requests that arise during battle to strike emergent threats. Immediate missions cannot be identified far enough in advance to permit dedicated mission planning or coordination.

C.1.9.3 Mission Requests

C.1.9.3.1 Support requests

The requesting commander identifies situations where combat force may be employed to accomplish the mission and submits either a Preplanned or Immediate Request. The method employed should be based on the tactical situation and priority of threat.

C.1.9.3.1.1 Preplanned Requests

Preplanned requests are based on requirements foreseeable early enough to be included in the ATO, or are less than Routine in priority. Preplanned requests are either categorized as scheduled or on-call.

C.1.9.3.1.1.1 Scheduled Requests

Scheduled requests require the requesting commander to identify the target and desired time well in advance. Scheduled requests offer greater opportunity for effective coordination and permit sufficient time to plan, brief, and assemble a properly loaded aircraft or package(s).

C.1.9.3.1.1.2 On-call Requests

On-call requests identify an anticipated requirement for air support to be available during a specified period of time. On-call aircraft or package(s) are configured with proper ordnance for the anticipated target and maintain an alert status. On-call requests may specify either airborne or ground/shipboard alert.

C.1.9.3.1.2 Immediate Requests

Immediate requests arise from situations that necessitate an urgent requirement for air support or exploit a time critical opportunity. The following definitions should be used to determine the required response.

C.1.9.3.1.2.1 Emergency

Targets which require immediate action and supersede all other categories of mission priority. (i.e., attacking units or identified hostile unit entering threat weapons range). Units with emergency requests should pass the codeword "SLEDGEHAMMER" to alert aircraft to the need for urgent assistance.

C.1.9.3.1.2.2 Priority

Targets which require immediate action and supersede routine targets (i.e., threat units closing or lucrative targets).

C.1.9.3.1.2.3 Routine

Targets of opportunity which do not demand urgency in execution.

C.1.9.4 Threat Level

Threat levels are based on current intelligence and determine mission feasibility and tactics.

C.1.9.4.1 Low Threat

Hostile combatant(s) possessing weak air defense capabilities but strong point defenses (i.e., radar directed AAA, SAM range less than 7 nautical miles (nm)).

C.1.9.4.2 Medium Threat

Hostile combatant(s) possessing moderate defense capabilities (i.e., Low altitude SAM's with range greater than 7 nm).

C.1.9.4.3 High Threat

Hostile combatant(s) possessing strong point defense and air defense capabilities or operation within range of shore based Integrated Air Defense System (IADS). For example: long range/high altitude SAMs, or fighter cover.

C.1.9.5 Command, Control, and Communications

C.1.9.5.1 Maritime Air Controller (MAC)

Designated by the Operations Theater Commander (OTC) or SUW Commander (SUWC) and is responsible for the coordination, tactical employment and safety of scene of action platforms. The MAC shall coordinate all arrivals, engagements, departures and BDA and ensure that information and the attack flow are optimized. MAC primary duties include the following.

i. Know enemy threat and location.
j. Know the specific ROE.
k. Locate targets.
l. Request maritime air support.
m. Control maritime air support assets.
n. Relay BDA, with recommendations for follow-on strikes.

C.1.9.5.2 MAC Priority

The priority for assigning a MAC will be the platform, airborne or surface unit with the best situational awareness.

o. Aircraft conducting surveillance and reconnaissance as primary missions shall be capable of acquiring and reporting known or suspected targets through control of MAS missions.
p. A surveillance or reconnaissance aircraft witnessing hostile intent or action in accordance with applicable ROE, will request immediate MAS and assume MAC responsibilities until so designated by OTC/SUWC or relieved by a more suitable platform.
q. Surface units may make a MAS request based on heightened tensions, specific Indications and Warnings (I&W) or need for immediate air support.

r. If a surface threat exists and no airborne control platform is available, SUWC will pass control of MAS aircraft to the surface unit under duress.

C.1.9.5.3 Control

s. The requesting unit will contact the OTC/SUWC and request MAS, followed by own position, type of platform (airborne or surface) and location of the threat.

t. In the case of an emergency mission OTC/SUWC will initiate by passing the codeword "SLEDGEHAMMER" and available aircraft will switch to designated frequency. This will allow strike communications without disrupting surveillance or reconnaissance in other sectors.

u. OTC/SUWC will then designate a MAC or assign MAS aircraft to the unit requesting air support and coordinate turnover. If no capable MAS aircraft is airborne, appropriate alert aircraft should be launched.

v. OTC/SUWC will confirm prior to releasing control of MAS aircraft to a MAC designated ship that positive radar contact and identification are held. If the MAC designated aircraft has no air search radar, the OTC/SUWC will verify that the ships point defense systems are in manual prior to clearing aircraft in close proximity.

w. For multiple hostile ship engagement, the MAC should prioritize the targets by threat. The MAC may assign aircraft a specific threat sector to engage targets, while using its own weapons to engage separate targets.

C.1.9.5.4 Communications

Communications must be flexible and responsive to ensure that links are maintained. The standard mode for all communications should be secure voice or frequency agile. The method however is secondary to the timely passing of critical information. Using multiple systems and redundant switches enhances the reliability and survivability of communications.

C.1.9.6 General Procedures

C.1.9.6.1 Check-in

Flight leads will provide controller with the following Check-In Brief information.

x. Identification/Authentication

y. Number and type of aircraft

z. Position and altitude

aa. Ordnance

bb. Play time

cc. Abort code

MAS aircraft will navigate independently toward assigned position and complete weapons and combat checklists while in transit. Upon arrival of the IP, aircraft will hold as required and report "*Established"*.

C.1.9.6.2 MAS Briefing (9-line)

MAC will provide flight leads with the following 9-line brief similar to the standard CAS 9-line brief. All members are responsible for copying the brief.

dd. 9-Line Brief

1. IP/BP (latitude (Lat)/longitude (Long), Georef)
2. Heading (Bearing in magnetic) and Offset
3. Distance (Range),(IP to target (TGT) in NM/BP to TGT in meters)
4. Target Elevation (normally omitted in MAS)
5. Target Description
6. Target Location (Lat/Long, Grid, offsets or visual)
7. Type Mark (laser, mark or fires) and Code, Laser to Target line (in degrees)
8. Location of friendlies/neutrals and position marked by
9. Egress
10. Remarks (as appropriate to include target course and speed, threats, restrictions, danger close, attack clearance, abort codes, hazards)
11. Time on target (TOT)

a. MAS aircraft will be directed to proceed to an IP based on Lat/Long, radial/DME from target, MAC designated ship TACAN position or available landmarks.

b. The IP can be used to designate individual station assignments for deconfliction. Changes to position assignments will be made by MAC as required. Threat disposition and neutral shipping will be reported using magnetic bearing and range from the target.

c. Once data has been entered into the aircraft system, the flight lead should initiate an alpha check to the target. The wingman shall acknowledge with concurrence.

d. The flight lead should update the briefed attack plan based on the 9-line and tactical situation. The flight lead should convey the attack type and weapons program. Plain English will be used to transmit any changes from the primary program.

e. The flight lead should also communicate "*Push Time"* for comparison by the wingman.

C.1.9.6.3 Controller Procedures

Baseline operating guidelines are presented below to assist in executing a successful mission.

f. Preflight planning becomes increasingly important when weather forces MAS aircraft down into a threat envelope. Target area tactics (marks, terminal control, ordnance deliveries, etc.) should be accomplished with minimal exposure to threat.

g. Night specifics.

1. Target identification is the most challenging aspect of performing night MAS.
2. Target marking will assist in target acquisition in conjunction with Night Vision Devices (NVDs) and onboard FLIR systems.
3. The use of IR pointers can expedite target acquisition, although high ambient light levels above .0022 LUX can make the IR spot difficult to see.

4. A LASER spot provides an extremely accurate mark. A restricted run-in heading/window should position the aircraft in the laser basket to acquire the spot. Joint laser comm brevity terms shall be used.

a. Target acquisition

1. Use talk-on techniques to narrow down MAS aircrews visual search of the target area.
2. For a visual mark, the standard call will be "From the mark. Direction (semi-cardinal) Distance (meters)".
3. Latitude should be allowed for MAS delivery tactics within the constraints of fire control measures, friendly or neutral positions and laser employment.

C.1.9.6.4 Engagement

a. Threat and weather determine tactics. Altitude and friendly positions should be used to operate in a sanctuary while remaining as near to the target as possible.
b. MAC will continuously monitor the tactical situation and make changes or recommendations as required, changes are made by identifying the line number and providing the new information.
c. The flight lead shall authenticate the action desired before the delivery run. Aircraft report *"In from the (cardinal heading)"* at the beginning of its delivery run and shall be advised to *"Continue"* by the MAC.
d. In the event of friendly/neutral contacts in close proximity to hostile targets, the senior flight member of the strike unit assumes engagement/deconfliction responsibility.
e. When aircraft reports *"Winchester"* , the MAC will direct additional airborne/alert aircraft to the scene as required.

C.1.9.6.5 Egress

f. Off target flow for the flight will be directed as specified in the 9-line brief.
g. Ensure the passing of a Checkout Briefing to follow-on agencies.

C.1.9.6.6 Battle Damage Assessment

h. All aircrew shall pass BDA as soon as possible to the OTC/SUWC via the MAC by secure voice or clear voice code words utilizing the format shown:

1. Call sign
2. Mission number
3. Request number
4. Location
5. Time on target
6. Results
7. Remarks and Amplifying information (weather, significant sightings, specific results)

a. Based on BDA, flight lead should recommend mission complete or re-attack.

b. If required, re-attack should be executed ASAP once threat status, tactics and targeting have been redefined.

C.2.0 JUSTIFICATION FOR AND NATURE OF CHANGES

C.2.1 AREAS COMMON TO ALL MISSION ELEMENTS

Currently, the mission planning process is extremely time consuming. A considerable amount of leg work is done by individual members of the strike team. A majority of the data is not available through one source, therefore, multiple sources have to be researched and invariably, those data sources are not located together.

If an external command has to be contacted, it is usually impossible to do so, and at times can be a "show stopper". There is a lag time and security problem with e-mail and phone lines are unreliable and also have a security problem. Space is limited on the ship, locating a place to plan, brief and debrief a mission can be difficult. At times tasking is received too late to do adequate planning. This is especially true with the Air Tasking Order (ATO). Fortunately, ATO missions are usually small and do not require the effort that large Airwing strikes do.

Data is often not up-to-date and trying to get the latest information to mission planners is next to impossible.

Being ashore doesn't necessarily fix these problems and at times can be even more of a hindrance if forces are operating from unimproved locations.

C.2.2 COMMON ERRORS MADE IN THE PLANNING PROCESS

Under the current process of mission planning, there is often not enough time to do proper planning for the flight.

Too many different sources/references have to be consulted. A lot of these sources are not located in the same place, so a lot of footwork is involved. Often, when deployed, the latest and most up-to-date information is not available. Difficult to contact other commands for briefings/debriefings while deployed. Security becomes an issue when using e-mail and phone lines.

Takes a long time to put a brief together

In summary, the fleet user needs a "One stop shopping" mission planning system that provides all of the data needed to complete a successful mission plan, or provides the connectivity to other systems that can provide the data and resources necessary to complete the mission plan. The current planning system does not adequately meet this requirement.

C.2.3 CAS

No specific data for this section. See section C.2.

C.2.4 FAC

No specific data for this section. See section C.2.

C.2.5 STRIKE COORDINATION AND RECONNAISSANCE

No specific data for this section. See section C.2.

C.2.6 ARMED RECCE

No specific data for this section. See section C.2.

C.2.7 DEEP AIR STRIKE

No specific data for this section. See section C.2.

C.2.8 SURFACE WARFARE

No specific data for this section. See section C.2.

C.2.9 MARITIME AIR SUPPORT

No specific data for this section. See section C.2.

C.3.0 CONCEPT FOR NEW OR MODIFIED SYSTEM

C.3.1 AREAS COMMON TO ALL MISSION ELEMENTS

Squadrons should have computers linked to CVIC and each department on the ship. The computers should have internet access and squadrons should have the ability to conduct secure teleconferences.

Squadron operation officers should receive mission tasking from CAG through a shipboard local area network (LAN). Strike leads should be able to access CVIC through the LAN in order to formulate an initial strike plan and notify all members of the strike team of a brainstorming/mission planning teleconference. This would allow strike leads to include external sources in the planning process.

Strike team members should have access to threat information, weapons status, navigation, weather, fuel programs, etc. to plan a mission. They should also have the ability to go "on-line" and find needed information elsewhere, if it is not available on the ship or is out of date.

The CAG laptop should also be done via a teleconference or at least called up from a ship's database. CAG should have the capability to access any planned mission on his terminal for a strike lead brief. This would alleviate the requirement for the strike lead to bring all planning materials to the brief.

The final brief should be able to be easily put together with amplifying information onto a standardized template presentation that could be tailored to the strike leader’s liking. This brief

should also be given through the ship's TV system or through a main frame projected onto all ready room white boards or screens.

As the strike is being flown, the capability should exist to send real time video of the target area, from either ground personnel or airborne aircraft, to the ship and to the strike aircraft themselves. Aircrew could then see the target area, the target weather, and the latest threat around the target and determine if the mission should be altered or continued as planned.

After completion of the mission, there should be a capability to send BHA to whoever needs it to establish the BDA. Mission specifics could also be sent to other commands or intelligence agencies. Another command might be planning a similar mission and would possibly find that information useful.

The debrief should be conducted in the same manner as the brief, but with the ability of the strike lead to reconstruct the mission on a screen with some sort of light pen or scratch pad pen. This would eliminate the need for white boards and also remove the need for the element leads to get together in one room.

C.3.1.1 Recommended TAMPS Improvements

Improvements need to be made to its reliability and speed. A windows based program that a strike planner can pull down and select topics off of a menu bar. The ability to open up various platforms at the same time and change parameters without closing a mission and reopening another. The whole thing should have Web access to other commands (i.e.. weather, Defense Mapping Agency (DMA), squadrons, etc.) via satellite link if necessary. The navigation, weapons programs, etc. should have hyperlinks that can instantly take you to another section of that program without closing the original. The whole system needs to be secure so that communication to outside commands can be made without security breaches. Along those same lines, it should be scaleable and portable. It should be able to hold a classification of secret, but be able to access Top Secret info without changing the classification. Ultimately, a real time system of communicating with a flight or ground force would be optimal. It should also have the ability to project a pre-formatted briefing, with the ability to use a light pen or something to that affect to make changes during the brief or debrief, real time.

C.3.1.2 Recommended Change in the Current Process

a. Be able to access all references (i.e.. TACMAN, MCM 3-1, IFR Supplement, High Altitude charts, etc.).
b. Be able to access external agencies (i.e.. Base Ops, weather, DMA, other squadrons, etc.)
c. Be able to access navigation, fuel planning, weaponeering programs, etc.
d. Be able to create a standard brief with template features (similar to PowerPoint) so that some things can be changed from brief to brief. Also an ability to make changes, remarks or diagrams with an electronic pen. For example, this would be handy for debriefing by being able to "draw the fight" on the screen. The whole system should have the ability to be projected onto a screen for briefings.
e. Print any of the above data in a color format

C.3.1.3 Needed Automated Decision Tools/Aids

Auto-router, radar/sensor performance predictions, weather, lunar/solar timetables to include luminosity, fuel planner, aircraft performance program (i.e.. for all other types of platforms), weaponeering programs, threat detection and performance predictions.

C.3.2 CAS

(See Aircrew CAS Planning Checklist in F/A-18 C/D TACMAN Vol 1, Figure 5-41.)

No specific data for this section. See section C.3.1.

C.3.3 FAC

No specific data for this section. See section C.3.1.

C.3.4 SCAR

No specific data for this section. See section C.3.1.

C.3.5 ARMED RECCE

No specific data for this section. See section C.3.1.

C.3.6 DEEP AIR STRIKE

No specific data for this section. See section C.3.1.

C.3.7 SURFACE WARFARE

No specific data for this section. See section C.3.1.

C.3.8 MARITIME AIR SUPPORT

No specific data for this section. See section C.3.1.

C.3.9 PLATFORM SPECIFIC INFORMATION

No specific data for this section. See section C.3.1.