# B.1.0 APPENDIX B - COUNTER-AIR MISSION AREAS, DESCRIPTION OF CURRENT SYSTEM OR SITUATION

Counter-air operations are those operations conducted to attain and maintain a desired degree of air superiority by the destruction or neutralization of enemy forces. Counter-air operations include such measures as the use of interceptors, strike aircraft, antiaircraft guns, Surface-to-Air Missiles (SAMs), and electronic counter-measures (ECM) to destroy the air or missile threat both before or after it is launched. Both offensive and defensive actions are involved. Offensive missions range throughout enemy territory and are generally conducted at the initiative of the friendly forces. Defensive missions are normally conducted near or over friendly forces and are generally reactive to the initiative of the enemy air forces. The Counter-air Mission Elements addressed in this appendix include Offensive Counter-air (OCA) and Defensive Counter-air (DCA).

OCA operations are based on the joint force commander's assessment of the overall threat, the mission, forces available, and other considerations of the operational situation and are conducted at a time and place of friendly force choosing rather than in reaction to enemy initiatives. Whenever hostile air power has the potential to threaten friendly operations, OCA operations must be considered for a major role in tactical operations. Targets and times of attack must be selected and offensive forces tailored to optimize friendly force offensive capabilities while exploiting enemy vulnerabilities. OCA operations may be the first consideration in the effective employment of friendly tactical air forces. The requirements imposed by the modern battle environment dictate that the joint force commander consider operations to attack follow-on forces in the deep battle area as well as to fight the close-in and rear battles. Successful OCA operations not only limit enemy attacks on friendly forces but also facilitate execution of all missions, including interdiction of follow-on forces, while reducing the number of enemy missiles fired as well as the capability of the enemy to conduct repeated large-scale attacks. Target selection must consider the commander's objectives and both the short- and long-term effects of reducing enemy air defense, reconnaissance, attack, Command Control and Communications (C3), Electronic Warfare (EW), and logistic support capability. OCA operations will attack enemy targets, both in the air and on the surface, both offensive and defensive, and as close to their source as feasible OCA missions against surface targets are interdiction types of missions and are only summarized in this appendix. Interdiction is covered in detail in Appendix C.

DCA operations (air defense) are conducted primarily in reaction to enemy air offensive initiatives and include all measures and means designed to nullify or reduce the effectiveness of hostile air attacks against the joint force. The purpose of DCA operations is to provide a secure area from which all elements of the joint force can operate effectively. To accomplish this, DCA operations defend friendly lines of communication, protect friendly bases, and support friendly land and naval forces while denying the enemy the freedom to carry out offensive air operations. Air defense operations provide protection of friendly assets and forces engaging in attrition of enemy air forces feasible. In the DCA roll, fighters will usually be used to defend a static or semi-static high value asset against an enemy air threat.

The following sections discuss the current Counter-air mission planning process, deficiencies and limitations, and concepts for a new or modified approach for Counter-air planning.

### B.1.1 TASKING

The task force commander will provide tasking for counter-air operations in order to gain control of the air environment and protect the Battle Group or the Marine Expeditionary Force ashore. At the start of operations, control may range from control of the air by hostile forces to air supremacy by friendly forces. It may also range from local air superiority in a specific part of the battle area to control over the entire area of operations or theater. Control may also vary over time. The degree of control required depends on the tactical situation; however, the task force commander must ensure that his forces are capable of achieving sufficient air superiority to ensure freedom of action for critical operations and protection of key assets. When there is an enemy air power offensive threat to friendly surface operations, the requirement for friendly counter-air action must be a major consideration in the joint planning for those operations.

Air superiority at the proper time and place provides friendly forces a more favorable environment in which to perform their tasks. Limiting the enemy's use of its air power provides increased potential for friendly force success. Because offensive and defensive operations must often rely on the same resources and are often conducted simultaneously in the same airspace, they cannot be considered in isolation from each other. The emphasis to be placed on either offensive or defensive counter-air operations will depend on the overall situation and the task force commander's concept of operations (CONOPS). Counter-air operations affect air, land, and maritime battles, and often cross the boundaries between them. Thus, forces of all components or supporting elements may be used. The employment of tactical air resources both afloat and ashore, requires careful coordination with respect to airspace control, safety of operations, and mission prioritization as well as execution.

### B.1.2 RESEARCH AND STUDY

#### B.1.2.1 Analyze Rules of Engagement (ROE)

The Fighter Leader reviews the ROE issued by the chain of command which delineate the circumstances and limitations under which Naval forces will initiate or continue combat engagement when hostile forces are encountered. The ROE include definitions of hostile acts by aircraft for other forces (e.g. launch of an anti-ship missile). For DCA, the Fighter Leader also reviews positive identification and control procedures which are established for identification of aircraft in the vicinity of a fleet-defended area. The optimum employment of counter-air weapon systems requires early separation of friend and foe to maximize beyond-visual-range engagement while avoiding fratricide.

For OCA, the Fighter Leader will review ROE for engagement of aircraft over hostile airspace as well as concerning the use of air-to-ground weapons when "getting them while they're on the ground." This includes restrictive measures such as Forward Edge of the Battle Area (FEBA) and Fire Support Coordination Line (FSCL) No-Fire Areas.

#### B.1.2.2 Check Weather

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.2.3 Asset Availability

Based on information at hand, make a rough determination of available assets including aircraft, sensors and ordnance.

The Fighter Element Leader may be assigned to execute several different types of fighter protection simultaneously. Depending on whether the assigned role is a Barrier Combat Air Patrol (BARCAP), Target Combat Air Patrol (TARCAP), or SWEEP (i.e., fighters sent ahead to "sweep" the airspace of adversary aircraft, thereby creating sanctuary for the other elements of the strike force), the leader needs to know what types and numbers of aircraft and weapons are available. F-14s and F/A-18s possess different capabilities and must be utilized carefully to maximize mission tasking. The numbers and types of aircraft may be assigned by the Air Tasking Order (ATO) or allocated by Strike-Operations (OPS) or the Fighter Element Leader. Given this information, the Fighter Element Leader formulates a "best fit" plan or requests a different allocation of aircraft.

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Fighter load-out is determined by the level of air-space control, tactics, striker self-escort capability, threat prediction based on the Air Order of Battle (AOB), and range to target. The Fighter Element Leader consults with the Carrier Air Wing (CVW) ordnance officer to determine specific weapons availability, and plans the fighter load-outs accordingly.

### B.1.2.4 Target Study

Target selection must consider the commander’s objectives and both the short- and long-term effects of reducing enemy air defense, reconnaissance, attack, C3, EW, and logistic support capability. OCA operations will attack enemy targets, both in the air and on the surface, both offensive and defensive, and as close to their source as feasible. The following potential OCA targets should normally be considered in the conduct of OCA operations.

#### B.1.2.4.1 Aerial Vehicles

This category may include enemy fixed-wing aircraft, helicopters, Unmanned Aerial Vehicles (UAVs), and cruise missiles.

##### B.1.2.4.1.1 On the Ground

In most situations, aircraft and air vehicles on the ground are targets for OCA operations. The decision to attack aircraft on the ground depends on whether they are revetted, sheltered, or in the open, as well as on available weapons and timely intelligence.

##### B.1.2.4.1.2 In Flight

Aircraft and air vehicles in the air may be targets for OCA operations. Priorities will depend on the battle situation.

B.1.2.4.1.3 At Sea and Forward Deployed Surface Ships

Surface ships such as carriers, cruisers, destroyers, and patrol boats equipped with aircraft and long- and short-range cruise missiles may be targets for OCA operations. Priorities will depend on the battle situation. Joint OCA operations by forces of all components may be required to attack enemy sea-borne forces.

B.1.2.4.2 Airfields and Operating Bases

Enemy airfields and operating bases vary in degree of vulnerability. Passive defense measures must be evaluated. Destruction of hangars, maintenance facilities, and Petroleum, Oils, and Lubricants (POL) facilities and other storage areas will affect the enemy's ability to generate aircraft sorties. Runway or taxiway closures may prevent use of the airfield for short periods, thus preventing subsequent takeoff and forcing returning aircraft to more vulnerable or distant locations.

B.1.2.4.3 Electronic Warfare Systems

This category includes enemy systems, airborne and surfaced-based, capable of performing ECM or EW support measures. Such systems, once detected and located are usually vulnerable and worthwhile targets.

B.1.2.4.4 C3 Facilities and Installations

An enemy that controls his forces closely is heavily dependent upon communications and other electronic means or upon rigid procedures to achieve that control. Application of C3 counter-measures (C3CM) can deny either the command function or the means of communication to exercise control, thereby greatly hampering operations. Sustained C3CM actions leading to the degradation or elimination of the means of command and control (C2) of forces can cause disintegration of enemy efforts. Regardless of the desired effects, coordination among components and participating agencies is paramount to ensure that the premature destruction of an exploitable information or intelligence source is not counterproductive.

### B.1.2.5 Friendly Situation/Disposition

The Fighter Leader reviews the disposition of the Battle Group, the Fleet air defense posture, Emissions Control (EMCON) condition, neutral forces including white shipping, alert status, Force Combat Air Patrol (CAP), Air-to-Surface Armed CAP (SUCAP), Anti-Submarine Warfare (ASW) and the type and location of other concurrent missions and strikes. If going over the beach the Fighter Leader also reviews the friendly force disposition, scheme of maneuver, locations, intentions, joint / combined forces, ground air defense posture and ROE.

Additionally, the planner will review Minimum-Risk Routes (MRRs) which are corridors of defined dimensions for use by friendly aircraft that presents the minimum known hazards to low-flying aircraft transiting the combat zone.

The Fighter Leader also reviews the Air Defense Operations Area which is an area and the airspace above it within which procedures are established to minimize mutual interference between air defense and other operations. Within it, Weapon Engagement Zones are established which define the responsibility for engagement for various weapon systems.

#### B.1.2.5.1 Missile Engagement Zone (MEZ)

This volume of airspace establishes control over engagements by SAMs.

#### B.1.2.5.2 Fighter Engagement Zone (FEZ)

Fighter engagement zones are established in those areas where no effective surface-to-air capability is deployed.

#### B.1.2.5.3 Weapons-Free Zone

An area where friendly aircraft are prohibited and air defense forces may engage without need to identify.

#### B.1.2.5.4 Joint Engagement Zone (JEZ)

Airspace delineated for joint use by Fighters and SAMs. It assumes that a deconfliction exists between the two, usually electronic Identification Friend or Foe (IFF).

### B.1.2.6 Enemy Order of Battle (EOB)/Threat/Situation

The Fighter Element Leader must answer several questions. What level of air-space control currently exists: none, superiority, or supremacy? Are fighters even required for the strike package? This information is determined by the intelligence personnel and then passed on to the aircrew, usually in daily briefings or posted in Aircraft Carrier Intelligence Center (CVIC). If the exact extent of air control is known, then the AOB is consulted for a determination of fighter assets required to protect the strike package.

For DCA, the Fighter Element Leader only concerns himself with the amount of enemy aircraft expected, in quantity, quality, and expected approaches. Threats may include manned and unmanned threats. For OCA, the Fighter Element Leader is concerned with the amount of enemy aircraft expected along the strike route of flight and in the target area itself. The Suppression of Enemy Air Defenses (SEAD) Element Leader handles protection from surface-to-air threats.

Two factors are particularly important when considering defenses of the target/target area include strike aircraft self-protection capability and strike density. The level of strike aircraft self-protection capability directly affects fighter tasking. The Fighter Element Leader consults with the Strike leader to determine the types and numbers of strike aircraft involved and tailors the fighter plan accordingly.

The Fighter Element Leader will review the threat AOB and tactics including:

- Interceptors / fighters base locations / type and model / number
- Aircrew proficiency / aggressiveness
- Air-to-air weapons (types / loadouts)
- Weapons employment doctrines
- Alert posture / anticipated response time
- Observed DEFPATS
- Tactics (observed / doctrine)
- All weather / night capability

- Combat radius / loiter time
- Autonomy / Ground Control Intercept (GCI)
- Onboard radar detection range azimuth look-up look-down
- Self-protect jammers
- RWR Capability
- Communications (Ultra-high Frequency-UHF / Very-high Frequency-VHF) / Data Link IFF type/expected use
- SAM / Anti-Aircraft Artillery (AAA) integration & deconfliction

Additionally, the Fighter Element Leader will study the threat air defense capability: SAMs, AAA, Man-Portable Defense Systems (MANPADS), integration/connectivity with Integrated Air Defense System (IADS), exploitable enemy weaknesses/vulnerabilities, disposition of forces, and doctrine tactics.

#### B.1.2.7 Threat Analysis Tools/Sources

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.3 CONCEPT DEVELOPMENT

#### B.1.3.1 Determine Ordnance Options

The Fighter Leader will determine ordnance options based upon aircraft/target characteristics, mission objective, threat, environment, and acquisition considerations (radar, Forward Looking Infrared-FLIR, laser, visual, etc.).

#### B.1.3.2 Determine Basic Concept Of Operations

Active air defense degrades the effectiveness of enemy air attacks and protects friendly forces. Integrated employment of air-to-air and surface-to-air systems through coordinated detection, identification, assessment, and engagement of enemy forces is necessary to blunt the enemy attack and protect friendly air and surface forces. Airspace control in an active air defense environment can be extremely difficult but is crucial to successful friendly air operations and effective air defense. Positive control or procedural measures must be implemented to ensure that friendly aircraft can safely transit the airspace without inhibiting air defense or other friendly air operations. Regardless of other controls and measures imposed within defended airspace, air defense forces must be able to identify all aircraft in the area readily by electronic, visual, or procedural means. Rapid, reliable, and secure means of identification, implemented within air defense areas, is critical to the survival of friendly aircraft as well as to the effectiveness of air defense. Various options for the organization of air defense resources provide effective air defense for the joint force.

a. Area Defense. A posture designed for the defense of a broad area. There can be specialized applications of area defense when friendly assets to be protected are spread over a large geographical area with defined threat boundaries.

b. Point Defense. A posture designed for the protection of a limited area, normally in defense of the vital elements of a force and of vital installations.

c. Self-Defense. A posture developed by friendly units to defend themselves against direct attack or threat of attack through the use of organic weapons and EW.

Execution of defensive counter-air operations requires a surveillance and reporting system capable of near-real-time production and dissemination of the tracking data necessary for the effective engagement of targets. Track production is a sequential process that begins with the surveillance function. As a track is detected it must be identified and labeled, and this information must be disseminated as rapidly as possible. The track data provided should be sufficiently detailed and timely to permit the C2 system to evaluate the track, determine the significance of the threat, and either designate air defense forces for interception or engagement or advise units of the passage of friendly aircraft.

Early warning of enemy attack is vital if in-depth defense is to be obtained. Active air defense should be developed to permit the interception of intruding enemy aircraft and missiles as early as possible and as far forward as feasible. The engagement process should continue, where possible, through the enemy aircraft's weapons release point and departure from the target area to ensure attrition of enemy aircraft returning to base. Careful control of available air defense assets is required. Careful consideration should be given to the allocation of available weapons to inbound threats before any allocation to Return to Base (RTB) aircraft. Weapon systems may be employed as described in the following paragraphs.

#### B.1.3.2.1 Interception

Intercept missions may involve use of aircraft from the scramble of aircraft from ground alert status, direction of aircraft from combat air patrols, or redirection of aircraft from other missions. Interceptions made with the assistance of air defense radars take the form of close control, or of a more generalized, broadcast control. In the event that no form of control is available, aircraft should be prepared to operate autonomously.

#### B.1.3.2.2 Combat Air Patrol

CAP missions enable rapid reaction to enemy intrusion and may be positioned well forward of areas to be defended. Patrols may also be conducted over a specific area, in support of friendly air or surface forces, over critical areas of a combat zone, and over air, land, and sea corridors. CAP missions may be supported by air-to-air refueling.

#### B.1.3.2.3 Air Escort

Air escort missions by air defense aircraft may be required in support of other aircraft.

#### B.1.3.2.4 Other Defenses Available

The fighters must be integrated with other defensive systems (SAMs, AAA) defending the High Value Asset (HVA). The Fighter Element Lead must be knowledgeable about the capabilities of these systems.

### B.1.3.3 Determine Strike Deception Routes

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document and specific details in Appendix C.

### B.1.3.4 Assess Likely Enemy Reaction.

Based on intelligence assessment, experience, and CONOPS, the Fighter Element Leader will make an assessment of the likely enemy reaction.

### B.1.3.5 Identify Essential Elements of Information not Available.

The Fighter Element Leader will determine needed items (imagery updates, missing / unknown information) and submit requests for information (RFIs) through intelligence.

### B.1.3.6 Determine Rough Fighter / SEAD Window Requirements

Based on the strike route and threat distribution, the Fighter Element Leader will determine the rough window for fighter support.

### B.1.3.7 Determine Package Requirements

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

#### B.1.3.7.1 Attack Aircraft

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

#### B.1.3.7.2 Fighter Aircraft

The Fighter Leader should be given as much latitude as possible in the detailed planning and tactical execution of counter-air missions. These missions include: MIPCAP (moving / stationary), MIPSWEEP (on-route / off-route), BARCAP (grinder/A-pole tactics), TARCAP (Attached / Detached), High Value Asset (HVA) CAP / Escort, Self Escort, Designated Swingers / Strippers and OCA interdiction. Based upon the mission objective, threat situation, ROE, Positive Hostile Identification (PHID) considerations, asset availability, and environmental factors the Fighter Element Leader will determine the number and type of aircraft, ordnance loads, positioning/routes for the mission. These missions fit into the following counter-air operations: Attack-Strike, Fighter Sweep, CAP, and Air-Escort.

##### B.1.3.7.2.1 Attack-Strike

Attack-strike (conventional) missions are intended to damage or destroy surface targets. In OCA operations, they are directed against ground targets and selected naval units that contribute to the enemy sortie generation capability and projection of airpower.

##### B.1.3.7.2.2 Fighter Sweep

The fighter sweep is an offensive mission by fighter aircraft to seek out and destroy enemy airborne aircraft or targets of opportunity in an allotted area of operations.

#### B.1.3.7.2.3 Combat Air Patrol

A CAP is an aircraft patrol provided over an objective area, over the force protected, over the critical area of a combat zone, or over an air defense area for the purpose of intercepting and destroying hostile aircraft before they reach their target or weapons release points. CAPs are used to provide temporary air superiority to protect friendly air or surface forces from air attack during the conduct of their operations. Although a CAP flight can patrol a general area or defend a localized area, it could also be positioned between the expected threat and the friendly forces to act as a fighter screen or barrier. CAP flights also contribute directly to DCA operations when they intercept and destroy enemy offensive aircraft before they can pose a threat to friendly forces.

#### B.1.3.7.2.4 Air Escort

When friendly aircraft, en route to or from a target or area, are subject to enemy air attack, escort aircraft may be assigned to cover the force. Escort aircraft can be tasked to defend surface attack missions, reconnaissance, airlift, search and rescue, aerial refueling, airborne C2 aircraft, and electronic combat aircraft.

### B.1.3.7.3 Indications And Warning (I&W)

Counter-air operations will make use of Indications and Warning to help gain a tactical advantage against airborne threats, these include Airborne Early Warning (AEW) and Intelligence Sources.

#### B.1.3.7.3.1 Airborne Early Warning

Airborne sensors serve to overcome range and low-level detection limitations inherent in a surface-based sensor system and should be integrated with surface systems. The use of AEW systems will extend detection ranges and consequently increase the time available for reaction. At the same time, the threat from low-level surprise attacks will be significantly reduced.

#### B.1.3.7.3.2 Intelligence Sources

These may provide indications of imminent hostile activity and possess the potential to provide early warning and positive hostile identification before it would be otherwise detected by the air defense environment. The maximum possible use of this information is essential. Clandestine sources may augment this information.

### B.1.3.7.4 Tanker Support

Air-to-air refueling must be considered for its potential advantages in enabling aircraft in the OCA and DCA mission areas.

- Concentrate in larger forces for an operation by extending their range and endurance
- Penetrate deeper into enemy territory with higher ordnance loads
- Maintain airborne alert for extended periods of time
- Extend endurance for recovery

- Deploy and re-deploy

In the counter-air battle in areas where the use of airspace is being strongly contested, the advantages of air-to-air refueling may not be available because of the vulnerability of aircraft engaged in the refueling process.

#### B.1.3.7.5 Spares

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.3.8 Supplemental Measures/Clarification

To ensure their success, counter-air operations must be supported by supplementary measures and operations. These include C3CM, EW, reconnaissance (including that provided by space-based elements), and special operations.

#### B.1.3.8.1 Command, Control, and Communication Countermeasures

Modern military forces are highly dependent upon C3 for effective application of combat power. The fundamental elements of C3 are human and machine sensors, processors, decision makers, and communicators. These elements are vulnerable, in varying degrees, to weapon effects, jamming, deception, and Operational Security (OPSEC). C3CM is a strategy that integrates the use of operations security, military deception, jamming, and physical destruction, supported by intelligence, to deny information to, influence, degrade, or destroy adversary C3 capabilities and to protect friendly C3 against such actions.

#### B.1.3.8.2 Electronic Warfare

EW supports the C3CM strategy, SEAD, and contributes to the success of counter-air operations by using electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum. EW also involves action to retain friendly use of the electromagnetic spectrum. EW actions to achieve these goals consist of ECM, electronic counter-countermeasures (ECCM), and electronic support measure (ESM).

#### B.1.3.8.3 Surveillance and Reconnaissance

Information derived from surveillance and reconnaissance will contribute to the planning and execution of counter-air operations. Most of this information will probably be derived from aerial surveillance and reconnaissance and from intelligence collections; however, for OCA operations, particularly SEAD, surface surveillance and reconnaissance may play an important part. To some extent, national sensor systems (including those that are space based) may also provide important surveillance and reconnaissance information.

#### B.1.3.8.4 Special Operations Forces (SOF)

SOF can collect intelligence, conduct direct-action strikes, and provide terminal guidance for air attacks against enemy airfields or operating bases. The use of SOF must be carefully planned as early as possible to ensure that they are inserted in locations that will support the joint force commander’s concept of operations.

#### B.1.3.9 Contingencies

The Fighter Element Leader objectively evaluates chances for mission success. This includes highlighting the risks involved and weaknesses which cannot be corrected, as well as the identification of possible contingencies which could effect mission success.

- Compare mission priority with your no-go criteria.
- Can your assigned objectives be met?
- Is threat suppression sufficient to allow for employment of weapons and delivery parameters?
- Which support aircraft are critical to mission success?
- Can the deck handle your launch plan?
- Are there enough assets to support the force defense posture?
- Are there any other unresolved issues requiring higher authority / guidance / approval?

Based upon this analysis, the Fighter Element Leader then prepares a backup plan for aircraft fallout / aborts and briefs it clearly so that all aircrew will understand their responsibilities.

### B.1.4 CONCEPT OF OPERATIONS BRIEF

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.5 DETAILED ELEMENT PLANNING

Using the final concept of ops approved and /or modified by higher authority, continue detailed analysis of the strike environment and integrated tactical planning.

#### B.1.5.1 Environment

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

#### B.1.5.2 Ingress Tactics/Flow Timing

The Fighter Leader defines the following items, as appropriate to the mission:

1. Element Deconfliction / Flow / Positioning
    a) Primary & secondary navigation lead
    b) Push flow / formations
    c) Routes / altitudes / speeds
    d) Descent / climb points
    e) Coast-in points
    f) Timing control points
    g) Navigation check / system update points
    h) Acceleration / split points

i) Initial Point (IP), radar visual

2. Deception: fighter group relative positioning
3. Tactical timeline
    a) SEAD package timeline from push point to launch / release point
    b) Fighter package timeline from push point through route
    c) Determine required High Speed Anti-Radiation Missile (HARM) suppression windows (amount of time each element is expected in threat Radar Terrain Mask (RTM) envelopes)
    d) Provide above information to SEAD planners as available
4. Threat avoidance / envelope management
    a) Anticipated RWR indications
    b) Planned defensive maneuvers / jinking
    c) Avoidance of enemy sea and land units
5. Defensive Electronic Attack (EA), Defense Electronic Counter-measure (DECM)
    a) ALQ-126, ALQ-162, ALQ-164, ALQ-165, ALQ-167/ availability / aircraft compatibility
    b) Activation points
6. Expendables
    a) ALE-39 loadout /program
    b) Chaff / flare programs (preemptive / reactive)
    c) Effectiveness vs threats
    d) Flashless squibs for night
    e) Use / availability of Generic Expendable Decoys (GEN-X) / MJU27/29 / etc.
    f) ALE-50 (QRT) availability
    g) Maneuvers required to enhance effectiveness

### B.1.5.3 Command And Control

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.5.4 Fighter Integration

The assigned Fighter Element Leader accomplishes fighter integration by coordinating with the Strike leader and the other Element Leaders (e.g., SEAD, E-2, EW, Tanker, etc.). Based on the overall strike concept the Fighter Element Leader will propose his best protection plan for the strike after review of the Naval Strike Air Warfare Center (NSAWC) Strike Planner's Checklist and consideration of the items in the following subsections. This protection plan is then passed back to the Strike leader for incorporation into the overall strike plan.

Route of flight for the fighters is based upon the missions assigned, BARCAP SWEEP, etc. More importantly though, in order to adequately protect the strike aircraft, the fighters must maintain a high level of situational awareness with respect to the strike package and SEAD plan. This is accomplished by a thorough knowledge of the strike aircraft planned routes and timing. The final briefing is crucial in assuring the fighters have the necessary knowledge of strike routes, altitudes and timing sequences.

ROE, Tactical Notes (TACNOTEs) and Air Wing Standard Operating Procedures (SOP) determine weapons systems coordination and engagement criteria. A plan for these issues is established by the Fighter Element Leader and briefed in detail prior to launch. Also included in this decision matrix is the fighter's fuel state and whether tankers are available.

The Fighter Leader determines the specific game plans / strategy for each fighter group. This includes:

1. **Pre-Commit**
    a) Radar: channels, presets, search contracts
    b) Formations/ visual lookout
    c) Positioning relative to attackers / HVA
    d) CAP patterns
    e) Communications
2. **Commit / Intercept**
    a) Authority
    b) Criteria
    c) Comm
    d) Intercept geometry / flow / DEZ
    e) Formation / airspeed / altitude splits
    f) Radar Modes
    g) Targeting Contracts: Factor Bandit Range Search
    h) Sort Contracts: Mate Meld / Lock
    i) Organic Positive Hostile Identification (PHID) Plan
        (1) Electronic Identification (EID)/Non-Cooperative Target Recognition (NCTR)/Tactical Communication Station (TCS)/ Forward Looking Infrared (FLIR) IFF / APX
        (2) Visual Identification (VID)
    j) Weapons employment / shot timeline
    -Who, when, how many, follow-up
    k) No clue / same lock / break lock / degraded radar
    l) Abort / reset criteria
    m) Float / strip / resume criteria
    n) Defensive considerations
        (1) Crank
        (2) RWR reactions (winning / loosing neutral)
        (3) Defensive notch (in/out)
        (4) Fwd / Rear Qtr Missile Defense
        (5) Infrared Counter-measures (IRCM)
        (6) Counter Arm
3. **Merge**
    a) Mindset (turn?)
    b) Visual targeting
    c) Section maneuvering
    d) Leakers / resume
    e) Blow-through: Tactical Lead (TACLEAD) change, flow, positioning

f) Communications

4. **Fighter Egress Plan**
   a) Change in fighter mission / mindset
   b) Short range commit
   c) Integration with attackers (route - SAM envelopes etc.)
   d) Communication
   e) GCI responsibilities
5. **HVACAP Coordination**
   a) Communications
   b) Visual signals, Air-to-Air (A/A) Tactical Control and Navigation (TACAN) system, formations, etc.
6. **Blue On Blue Considerations**
   a) Return to Force (RTF) procedures
   b) VID/EID/PHID
   c) Altitude blocks
   d) Airspeeds
   e) Code words
7. **Contingencies / What Ifs**
   a) Reduced fighter fill plan
   b) Undetected entry
   c) Communications jamming

### B.1.5.6 Indications and Warning (I&W)

1. Priorities / responsibilities / filter plan
2. VQ / VAW coordination
   a) PHID information / correlation
   b) Purple info available to strike real-time
      (1) Via E-2 /Link
      (2) Via other channels
3. VQ / VAQ Coordination
   a) Exploit versus deny considerations
   b) Warm

### B.1.5.7 Attack

See the generic process described in Section 3 of the main CONOPS document and Appendix C.

### B.1.5.8 Go Criteria (Assets / Systems)

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

## B.1.6 DETAILED ADMINISTRATIVE PLANNING

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.6.1 Requirements/Availability of Weapons, Fuses, Pods

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.6.2 Miscellaneous Support

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.6.3 Flight Administrative Timing

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.6.4 Rendezvous

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.6.5 Tanking

Missions should be planned with the objective to minimize tanking. If tanking is required, careful consideration should be given to the hose-to-receiver ratio, sour tanker backup plan, and receiver sequencing to optimize the flow of the strike package and support aircraft. Plan using a maximum 4-to-1, receiver-to-hose ratio. The tanking plan should:

- Assume a 50% effective give to all aircraft for fuel passed
- Assume 10 minutes for 8000 pounds of gas per jet
- Available Give vs Range
- Tanking sequence / airspeed / begin & end points
- Tanker detachment & RTF procedures
- Sour Package backup plan
- Stragglers / drop dead time

The fighters must know if tankers are available and exactly where the tankers are located. This information is crucial during the entire time of flight, and is stated during the final strike package briefing. The fighter tanker plan is critical. Fighters must stay above a predetermined amount of fuel, which is situation dependent and decided prior to take-off.

For OCA, range to the target directly affects fuel requirements. Fuel considerations are of paramount concern to the Fighter Element Leader, since total fuel allocations may very well dictate the fighter tactics. The amount of fuel available may create an iterative process in the fighter planning process. Fuel availability is usually provided to the fighter leader by the Strike leader but becomes a two-way discussion item as tactics and routes are finalized.

#### B.1.6.6 Launch/Recovery

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

#### B.1.6.7 Return to Force

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.7 VALIDATE AGGREGATE PLAN (COORDINATION/DECONFLICTION)

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.8 CREATE AIRCRAFT DATA LOADS AND FLIGHT AIDS

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.9 REHEARSE MISSION

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.10 AIRCREW BRIEF AND MAN-UP

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.11 LAUNCH, EXECUTE MISSION, AND RECOVERY

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.12 POST FLIGHT DEBRIEF

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.1.13 POST FLIGHT ANALYSIS AND REPORTING

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

# B.2.0 JUSTIFICATION FOR AND NATURE OF CHANGES

## B.2.1 DEFICIENCIES AND LIMITATIONS OF CURRENT SYSTEM

The current system has the following general deficiencies regarding Counter-air mission planning:

- The current system does not support "Single Window Mission Planning". The system does not allow the simultaneous creation, editing, and display of multiple routes on one screen.
- The current system does not provide "look and feel" of Microsoft Office type applications which most users are familiar with.
- The current system's Human-Machine Interface (HMI) is not intuitive to the aircrew. The interface is not standardized across all mission planning modules. Additionally, there is no method to stop a task started inadvertently. The current system does not provide capability for the user to customize the interface including preferences and defaults.
- The current system does not provide sufficient automation to allow rapid generation of a flight or mission plan.
- The current system does not provide an auto-router capability.
- The current system does provide mission planning folders with templates of generic and specific mission profiles.
- The current system does not provide a take-off and landing (TOLD) weight and balance/load calculation capability.
- The current system does not provide the planner with flexibility to customize and tailor mission plan outputs and flight aids.

Specific deficiencies related to each of the steps in the planning process are addressed in the following paragraphs.

### B.2.1.1 Tasking

The current system does not provide the capability to automatically parse an ATO and generate mission tasking. The current system also does not provide tools to generate tasking from Operational Orders (OPORDERs), Fragmentary Orders (FRAGORDERs), Special Instructions (SPINS), Operational Tasks (OPTASKs), contingency planning tasks, messages, verbal orders, or flight and training schedules. This is a vital and integral part of a complete mission planning system.

### B.2.1.2 Research and Study

There is a need for on-line, web-like, interactive information resources including but not limited to:

- ROE, TACNOTES, Tactical Procedures (TACPROS), Tactical Manuals (TACMANs) and other Strike Procedures (STRIKEPROS).

- Weather and environmental information (e.g. current and forecast weather, imagery, sun/moon illumination, tidal information, etc.) is received from numerous sources. This includes the weather forecaster, closed circuit television (TV), electronic messages, and software programs, Electro-Optical Tactical Decision Aid (EOTDA), etc. As a result, mission planners waste time searching for a reliable source of information.
- Current and projected position and movement of friendly forces.

The current system does not automatically identify mission information and then provide tools to prepare and forward information requests for that data. The current system does not automatically create planning folders with all strike/mission related information and products.

The current system does not have a large screen display which will allow planners to review mission related information.

In the current system Mapping, Charting, Geodesy and Imagery (MCG&I) information and products (e.g. maps, elevation data, photography, etc.) is often outdated, inaccurate and limited in quantity. In addition, once this information is obtained, it must be manually manipulated into useful products for mission planning (e.g. overhead transparencies, kneeboard cards, etc.) and is not capable of being inputted into existing automated planning tools or aircraft Data Transfer Devices (DTDs).

### B.2.1.3 Concept Development

The current system does not provide interactive distributed collaborative planning capability or tools. The current system does not provide electronic white board, video teleconferencing, or large screen display capabilities for development of a strike/mission concept. The current system does not provide the capability to automatically generate concept routes, timing control points, and task detailed planners to refine these routes. Nor does the system provide a common operational picture to overlay these concept routes on. The current system does not provide planners integrated access to Joint Munitions Effectiveness Manuals (JMEMs) weapon options, including ordnance availability, target characteristics, desired damage criteria or objectives, environmental factors, threat considerations, ROE, and aircraft carriage/delivery capabilities and limitations as specified in Naval Air Training and Operating Procedures Standardization (NATOPS).

The current system does not provide a means to graphically and interactively develop a SEAD concept plan. The current system does not provide a means to graphically and interactively develop a counter-air concept plan.

### B.2.1.4 Concept of Ops Brief

The current system does not provide the capability to automatically or manually develop CONOPS briefings in Power Point-like format. The current mission planning system does not have the tools or ability to generate, display on a large screen display, or print large format CONOPS briefings, which are a critical in the development and completion of the mission/strike plan, as well as dissemination of information to other mission/strike leaders.

### B.2.1.5 Detailed Element Planning

The current planning system has the capability to perform fuel planning, however it is not NATOPS certified. The current process is to perform route planning on Tactical Automated Mission Planning System (TAMPS) (for data file loading), then duplicate the route on Navy Portable Flight Planning Software (N-PFPS) for fuel planning solutions. Operational Requirements Document (ORD) to complete the mission plan within two hours are already challenged, considering the speed limitations of TAMPS. The additional requirement of performing the fuel planning on PFPS adds time to the limited mission planning timeline. Availability of these systems may also impact the success of this process.

The current mission planning system has no direct access to tactical manuals or NATOPS publications for any given aircraft. This data is required to complete the mission plan and to automate the planning process.

In addition to the inability to generate, display and print briefings, printing and plotting on the current system in general are slow and unreliable.

The current system does not provide tools to graphically or textually develop a Counter-air concept including the mix, weapon load, ROE, sensor coverage, tanking, and positioning of such elements as fighter sweeps, combat air patrols, and air escort.

The current system does not provide a capability for strike/mission planners to access JMEM weapon options, including ordnance availability, target characteristics, desired damage criteria or objectives, environmental factors, threat considerations, ROE, and aircraft carriage/delivery capabilities and limitations as specified in NATOPS.

The current system does not provide certified stores planning and weaponeering capability.

The current system does not accurately reflect the store loadouts for all airframes nor does it allow users to override stores restrictions due to operational necessity.

The current system does not provide integrated weapon systems mission planning, allowing for simultaneous aircraft and weapon systems mission planning.

### B.2.1.6 Detailed Administrative Planning

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

### B.2.1.7 Validate Aggregate Plan

Mission Planning coordination/deconfliction is conducted manually, utilizing existing mission planning products to identify and solve coordination/deconfliction problems. This is usually done prior to the concept of operations brief, but this may be done at this level as well. Overlays of routes, communications plans, load plans, fire support, etc. are compared to each other and double checked for accuracy. Issues that cannot be resolved at the mission planner's level, are passed to a higher level to be resolved. This at times impacts the timely changes to the plan. At times, those changes may not be relayed to the operators.

The current system does not provide a frequency deconfliction tool for radar, communication, EW, and data link frequency.

#### B.2.1.8 Create Aircraft Data Loads and Flight Aids

There are several deficiencies with the current planning system regarding aircraft data loads. One deficiency in the system is the amount of time it takes to download mission and support data to the DTD. For a coordinated strike, multiple DTDs have to be loaded for strike division. When the time to load each DTD is summed, the aggregate time can be extensive.

#### B.2.1.9 Rehearse Mission

The current system does not provide the capability to seamlessly integrate with a Mission Rehearsal Module. Nor does it provide the capability to dynamically create or modify a route from the Mission Rehearsal Module for input to the Mission Planning System.

#### B.2.1.10 Aircrew Brief

The current mission planning system does not have the tools or ability to generate, display (Large Screen Display (LSD)) or print CONOPS briefings, which are critical in the development and completion of the mission/strike plan, as well as dissemination of information other mission/strike leaders.

#### B.2.1.11 Execute Mission

There are no unique Counter-air functions performed in this mission planning task. See the generic process described in Section 3 of the main CONOPS document.

#### B.2.1.12 Post Flight Debrief

The ability to record all details of the mission including sensor and Multi-Function Display (MFD) display video, and Global Positioning System (GPS) position would be extremely useful for mission playback during debriefings and to develop lessons learned. In an era of decreased training flights, it is becoming increasingly important to thoroughly debrief each flight including complete mission playback to ensure achieve maximum learning value. Furthermore, the ability to reproduce flight information and notes on a large screen display with overlays from the planning process will enable the flight participants to understand the differences from planned and executed mission elements.

#### B.2.1.13 Post Flight Data Analysis

Post flight data analysis is currently limited to the systems that exist that can record mission data. The current system does not have the capability to electronically archive mission results information, including imagery, aircraft digital data recordings, debrief notes, and cockpit video in the Mission Folder. Additionally, the current system does not have tools for the production and transmission of reports/messages such as Operation Intelligence Report (OPINTREP), Mission

Report (MISREP)/Operations Summary (OPSUM), Tactical Electronics Intelligence (TACELINT), Decision Support System (DSS), STRUM, and Proforma Activity Report.

## B.3.0 CONCEPT FOR A NEW OR MODIFIED SYSTEM

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 Carrier Air Group (CAG) commander through a shipboard Local Area Network (LAN). Fighter leads should be able to access CVIC through the LAN in order to formulate an initial fighter plan and notify all members of the counter air team of a brainstorming/mission planning teleconference. This would allow fighter leads to include external sources in the planning process.

Counter air 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 (VTC) or at least called up from a ship's database. CAG should have the capability to access any planned mission on a terminal for a Fighter Element Lead brief. This would alleviate the requirement for the fighter 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 Fighter Element 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.

The debrief should be conducted in the same manner as the brief, but with the ability of the Fighter Element 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.

### B.3.1 RECOMMENDED TAMPS IMPROVEMENTS

Improvements need to be made to TAMPS reliability and speed. A windows based program whereupon 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 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.

### B.3.2 RECOMMENDED CHANGE IN THE CURRENT PROCESS

a. Be able to access all references (i.e., TACMAN, MCM 3-1, In-Flight Route (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.

### B.3.3 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.