H.1.0 APPENDIX H - RECONNAISSANCE MISSION AREAS, CURRENT SYSTEM OR SITUATION

The following Reconnaissance (RECCE) Mission Elements are addressed in this appendix.

- Tactical Air (TAC AIR): F-14 Tactical Air Reconnaissance Pod System (TARPS)/FTI, F/A-18D Advanced Tactical Airborne Reconnaissance System (ATARS), AND F/A-18F SHARP
- Unmanned Aerial Vehicles (UAVs): Pioneer, VTUAV
- Maritime: P-3, EP-3, and S-3

This appendix addresses the current mission planning process, deficiencies and limitations, and concepts for a new or modified approach for these mission elements.

H.1.1 BACKGROUND, OBJECTIVES, AND SCOPE

This appendix is structured around a "most likely" reconnaissance planning flow. This structure is used to describe the reconnaissance planning process as it exists today.

H.1.2 OPERATIONAL POLICIES AND CONSTRAINTS

The Tactical Automated Mission Planning System (TAMPS) version 6.1 will be considered baseline when bearing in mind current day reconnaissance planning functionality.

H.1.3 DESCRIPTION OF CURRENT SYSTEM OR SITUATION

H.1.3.1 Electro-optical Reconnaissance

The electro-optical reconnaissance planning flow begins with the reception of either tasking the Air Tasking Order (ATO), or flight schedule (for shore based training missions) and the collection of mission support data. An electro-optical reconnaissance team, which is usually composed of one or two F-14 pilots and Radar Intercept Officers (RIOs), will be tasked to quickly create a concept plan from the tasking and support data. Once the Carrier Airwing Group (CAG) commander reviews and approves this concept plan, the team will commence the detailed planning. The nature of this planning is largely governed by the Strike Planner's Checklist and contains such general areas as targeteering, weaponeering, suppression of enemy air defenses (SEAD), strike composition, strike timing, and tactics, techniques, and procedures (TTPs). The reconnaissance planning team must identify pertinent tactical mission areas for integration with reconnaissance specific mission characteristics. Very few reconnaissance missions are directly associated with strike plans.

Once the final reconnaissance plan is approved, Unit Planners can prepare aircraft data-loads and kneeboard cards and also conduct mission rehearsals using Tactical Operational Preview Scene (TOPSCENE). The Strike Leader will be busy at this time creating the overall strike briefing (if the reconnaissance mission is in support of, or needs to be deconflicted with a simultaneous strike). After the overall briefing, the Element Leaders will give element briefings and wingman briefs will also be conducted. Following these briefings, the aircrew is prepared to launch,

execute the mission, and recover. Upon return, aircrew debrief mission details in the Carrier Intelligence Center (CVIC).

The only current carrier based reconnaissance capable Navy platforms are the F-14 equipped with TARPS and UAVs. Due to range restrictions UAVs are generally deployed ashore or to smaller vessels for launch closer to objective. Of these, only the F-14 Mission Planning Module (MPM) currently has provisions for planning TARPS missions.

The basic planning flow described below is based on a combat scenario with the reconnaissance mission included as a strike element. Manned reconnaissance missions overwhelmingly fall into four categories; standoff imagery collection, point targets of interest, training, and mapping. Each of these missions is generally carried out in a low to moderate threat environment independent of a strike. However, the reconnaissance mission, as a strike element, is the most inclusive mission and all aspects of the planning process are contained within the combat mission planning scenario.

a. Tasking is received via flight schedule (training) or ATO (combat).

b. RECCE aircrew is assigned to mission plan the RECCE mission from squadron operations.

c. Strike lead orders strike planning team meeting to discuss overall mission, assign tasks, and organize assets. This can take a lot of time as it isn't always easy to contact all the assigned mission planners and arrange for a meeting on such short notice. Even on an aircraft carrier, where everyone is within 1000 feet of each other, organizing an initial strike planning meeting can take a few hours (on a no-fly day) to several days (because there may be several team members who are flying which conflicts the planning schedule). Additionally, quite frequently (in a combat scenario) there will be several strike planning meetings occurring simultaneously which can overcrowd the planning room, leading to distractions and confusion. Because of the nature of the material discussed, a secure area is often required, and CVIC is generally the only place on there ship where a mission can be planned with enough room to plot it out on charts.

d. Straight line preliminary routes are planned using Tactical Strike Coordination Manager (TSCM). Planning team may be assigned several tasks. In the case of the RECCE aircrew, they will be assigned several RECCE targets to plan for and may be assigned to work on another mission planning team as well (i.e. SEAD team, Fighter Mission Planning team, etc.). Initial RECCE route planning is often accomplished via TAMPS, but if the computer terminals are occupied with more important planning, basic pen-to-paper chart planning is done.

e. Strike Lead gathers preliminary plan from each of the planning teams and puts together a "laptop" brief to give the CAG / Airwing Commander. The logistics involved in collecting team inputs is somewhat easier because tasks have already been assigned and focus is set.

f. After strike lead brief has been approved, the RECCE team goes off to prepare a much more detailed plan. The planners will be required to collect and determine the following:

    1) Contact meteorology to collect detailed weather briefing of each target area to include current weather and predictions on cloud cover, humidity, precipitation,

temperature, particulate (smoke) estimates, Electro-Optical Tactical Decision Aid (EOTDA), contrail levels, wind speed, and direction.

2) Contact squadron intelligence (INTEL) for delivery of charts, any current imagery available for planning / target study, Rules of Engagement (ROE), enemy surface and air orders of battle. Other environmental factors to take into consideration in the RECCE planning process include: sun/moon angles & illumination (empirical tables), radar horizon & terrain masking (TAMPS 6.1 or Navy Portable Flight Planning Software (N-PFPS)). Additionally, due to the lack automation, RECCE crews seldom put in requests to task airborne long duration UAV's for the most up to date imagery.

3) RECCE mission planners will usually use TAMPS 6.1 at this stage to continue on their flight route planning for non-RECCE related planning – chart work is also an option if TAMPS is not available. Waypoints / flight plans, and fuel predictions will be plotted and Joint Tactical Information Distribution System (JTIDS) loads planned, and the data downloaded onto a data storage unit (DSU) for later data upload into the aircraft. Additionally, kneeboard cards and strip charts will be printed. Currently, the F-14 "Tomcat" MPM is the only module capable of electro-optical reconnaissance mission planning (limited functionality in TAMPS 6.1/6.1.1 and a much more user friendly interface with improved functionality expected in TAMPS 6.2). The F/A-18C/D "Hornet" ATARS is scheduled to have Initial Operational Capability (IOC) sometime in Fiscal (FY) 99. Additionally, the F/A-18F SHARP reconnaissance system is expected to IOC sometime in FY03. UAV operators have no current TAMPS MPM support for electro-optical reconnaissance and always plan their missions utilizing pencil-to-paper and chart planning instead of TAMPS. TSCM and TOPSCENE use requires a lot more effort and is generally avoided in the UAV community. Aside from these differences, the mission planning flow is still generally the same for UAV operators planning an electro-optical reconnaissance mission. Furthermore, increased resolution and range capabilities and multiple sensors associated with manned platforms requires a higher level of effort to plan a mission.

4) At this stage, a detailed defensive / offensive tactics plan is developed utilizing such publications as the related aircraft Tactical Manuals (TACMANs), the Top Gun Tactics Manual, MCM 3-1, Naval Air Training and Operating Procedures Standardization (NATOPS) Unclassified Manual and Classified Supplements. Fighter crews will generally plan fighter timelines, ingress, egress, etc. See sections 3.3.5.2 and 3.3.5.3 for details.

5) Imagery planning will usually follow to include optimizing camera on / off times, required altitudes for proper photographic terrain coverage, photo spot size, synthetic aperture radar (SAR) coverage, radar horizon, electro optical (primarily infra-red) performance predictions, etc. These parameters are currently determined through use of tables, charts and other related publications. Through use of these non-electronic tools, imagery planning is performed and the RECCE route plan is improved upon (if required). For digital imagery capable of being

down-linked (near real time), the mission planner will resort to pencil-to-paper planning for determination of optimum downlink altitudes, positions, and headings.

6) After the refined RECCE plan is complete, it is submitted back to the strike lead to assure route deconfliction. Completed routes may or may not be input back into TSCM for overall strike rehearsal / deconfliction verification.

7) Load plans are constructed (pencil-to-paper) and submitted.

8) At this point, if time exists prior to the brief, the RECCE pilot has the option of utilizing TOPSCENE for mission rehearsal. To rehearse to mission, the pilot can either manually input as many waypoints as desired (for Heads-Up Display-HUD steering), or just try to fly the route without any steering indications.

9) Meanwhile, the aircrew that are not rehearsing the mission will be preparing an aircrew brief. This is usually accomplished utilizing a white board (dry erase board) and / or overhead transparencies.

10) After the brief, launch, execution, and recovery, the flight crew will usually take a quick visit to CVIC to drop off data tapes, cameras, and debrief the intelligence officers on what was seen during the flight.

11) A strike debrief will usually be convened by the strike lead, who will utilize a white board / overhead projector to draw diagrams and assess the level of success of the planned mission.

H.2.0 JUSTIFICATION FOR AND NATURE OF CHANGES

H.2.1 JUSTIFICATION FOR CHANGE

RECCE Mission Planning deficiencies include:

a. Current F-14 TAMPS electro-optical reconnaissance mission planning functionality needs to be incorporated into JMPS.

b. Limited F/A-18 electro-optical reconnaissance needs to be improved upon and added into JMPS.

c. Currently there is no UAV automated mission planning software. One needs to be developed for JMPS.

d. Current unitary detailed mission planning software (i.e. TAMPS) has no ability to link directly to a force level mission planning and coordination program (i.e. TSCM). (D-H.2.1-4)

e. Weather information download is not readily available directly from current mission planning terminals.

f. Currently, mission planning software has no capability of linking directly to a UAV operator authority and / or the Airwing Commander for transmittal of airborne UAV tasking requests.

g. Current mission planning software has no direct access to tactical manuals, threat data bases, and NATOPS publications for any given aircraft.

h. There is no EOTDA in current mission planning software.

i. There is no digital downlink performance prediction in current mission planning software.

j. There is no Airwing load plan request/order functionality in the current force level mission planning and coordination program.

k. There is no current capability to link, transmit or download a mission plan directly to a mission rehearsal station.

l. There is currently no ability to use current mission planning software as a briefing tool.

m. There is currently no ability to display/load country buffer zones associated with long-range missions.

n. No ability to locate and task airborne tanking assets.

o. No ability to access area divert fields/Notice to Airmen (NOTAMS)

p. No ability to access EP-3/EA-3 schedules or assets

q. No ability to access area comm plan

H.2.2 PRIORITIES AMONG THE CHANGES

Table H1 lists the essential improvements needed for RECCE missions.

Table H1. Essential (Highest Priority) Improvements.

~~Develop UAV mission planning functionality.~~
Develop F-18 ATARS mission planning functionality.
~~Develop EOTDA for any aircraft and electro-optical senso~~r. **Unnecessary until longer range stand-off (SHARP)**
Develop F/A-18F SHARP mission planning.
Link to Modernized Intelligence Data Base (MIDB). Provide an interface to a single threat and target database, which incorporates organic and non-organic sources, provides for fusion and quality control, and disseminate to users with measures of confidence to include geo-location accuracy and time latency. The selected database will provide tools to the tactical analyst to recognize and resolve ambiguities between data sources.
Display image data near real time.
Strike Leader access to National Reconnaissance Assets. Provide the Strike Leader access to the timeline for National

Reconnaissance Assets.
Mission information archive. Provide the capability to electronically archive mission results information, including TARPS Digital Imagery (DI) products, National imagery, UAV data, aircraft digital data recordings, Airwing Intelligence (AI) debrief notes, and cockpit video.
DI input to Joint Services Imagery Processing System-Navy (JSIPS-N) Strike Planning Archive (SPA), and Image Product Library (IPL) library. Provide the capability to input DI products into the JSIPS-N SPA/IPL library.
Retrieve weather. Provide electronic access to METOC data elements, products and related tools to Strike Leaders, Unit Planners, and Element Planners (including Tomahawk). Display Meteorologic and Oceanogrpahic (METOC) data as part of providing situational awareness to the users.
Briefing tools. Provide the capability for the strike lead and/or element lead to prepare an aircrew brief directly from the terminal that he/she mission planned.
Direct link to mission rehearsal station.
Load plan assignments. Provide the capability for the strike lead to provide ordnance and maintenance departments with load plans and ordnance requirements.
Provide the capability to access tactical manuals, threat data bases, and NATOPS publications for any given aircraft.
Near Real-Time Digital Imagery Transfer from digital reconnaissance platform directly JMPS Large Area Network (LAN).
Real-Time airborne UAV tasking requests to Airwing commanders and replies from UAV operators.
TAMMAC RECCE imagery upload capability.

H.3.0 CONCEPT FOR A NEW OR MODIFIED SYSTEM

H.3.1 BACKGROUND, OBJECTIVES, AND SCOPE

This section describes the RECCE planning process with the candidate changes from Section 4 implemented.

H.3.2 DESCRIPTION OF THE NEW OR MODIFIED SYSTEM

The following subsections describe many specific enhancements that the JMPS Software configuration will bring to particular aspects of the RECCE planning process. In addition to these

specific enhancements, there are several improvements that will apply to most or all aspects of the process. These general capabilities are considered essential backbone data management functions, which the planning phase specific requirements depend upon for efficient and protected communications. These necessary data management functions are briefly described here and appear throughout the subsections that follow.

a. When logged on the user will have access to the support databases available within the physical space of CVIC or other shore-based (i.e. Marine) mission planning facilities. This capability provides resource scheduling flexibility and strike planning surge capacity to meet short duration maximum efforts.

b. A multilevel security system will ensure compartmentalization between systems. This will preclude access to information for which the system is not authorized. This capability will also resolve security issues associated with remote access to planning databases and systems.

c. Distributive planning tools will be available through the JMPS network. These tools will allow a user to share his / her unit, element, or strike level plan with other users for review, approval, and monitoring.

d. Collaborative tools will be available to support planning and communications between Strike Leaders, Element Leaders, and Unit Planners. These tools utilize technologies such as electronic white board, e-mail, and video teleconferencing technologies via the network and the Secret Internet Protocol Routing Network (SIPRNET). Information access will be expanded and made quicker due to this capability. This capability will allow face-to-face communication without incurring the cost of "travel time."

e. One added component, not currently deployed, but shall be included, is a force level mission planning and coordination module. A majority of the Strike Leader's tools referenced in Section 5 will be performed on this component.

The following subsections of Section 5 provide greater detail regarding the specific nature of other candidate improvements for reconnaissance mission planning described in Section 4.2.

H.3.2.1 Receive Tasking and Collect Mission Support Data

The following subsections describe JMPS improvements in the area of reconnaissance. Overall vision: to be able to sit down at a JMPS terminal, receive tasking, collect data, coordinate with other planners at other terminals / sites, plan an approved reconnaissance mission, prepare a Mission Data Loader (MDL) cartridge, rehearse the mission, and put together a brief without ever having to leave from the computer terminal. All to be accomplished, from start to stop, in 1.5 to 3 hours.

H.3.2.1.1 Tasking

Strike tasking will ordinarily reach the mission planner in the form of an ATO. The ATO will be received via ship's radio communications message traffic circuits and disseminated automatically via entry into Global Command and Control System-Maritime (GCCS-M). Force level mission planning and coordination management software will electronically parse and input the ATO or non ATO tasking which will be made available to mission planners via the JMPS LAN.

Reconnaissance planners will access strike coordination straight line routes and times on target(s) via the JMPS interface. The strike planning and coordination module will enable users to access ATO information and to view tasking in either a textual or visual format. The textual format will allow planners to verify final planning factors (e.g., number and type of aircraft and/or weapons, target, time-on-target, etc.) which were evolved collaboratively with ATO planners during ATO development. Planners will invoke visual display of the ATO by simply selecting desired elements of the tasking data. The visual display of tasking data will be comprised of simple straight "stick routes" superimposed on a chart to notionally represent the tasked mission. For example, a stick route might show the mission as comprised of four legs; (1) launch direct to tanker, (2) tanker direct to reconnaissance target, (3) target direct to tanker, (4) tanker direct to recovery, as defined by the ATO. After visually examining the selected tasking, the planner will see other operations scheduled to occur in the same vicinity, both in time and space. The user will be provided the capability to place those missions not contained in the ATO into the tasking database for visual or textual display. The planner will define the area and time interval of interest and the force level mission planning and coordination manager will display stick routes of other tasked ATO activity as a function of time. This will provide the planner the information he/she needs to avoid potential conflicts in the development of the mission plan.

All platforms involved in RECCE will start their mission planning in this fashion. These platforms include, but are not necessarily limited to; UAV, F-14, F-18.

H.3.2.1.2 Research

The following information will be available via LAN directly from the JMPS terminal.

H.3.2.1.2.1 Rules of Engagement

ROE information will be electronically available to planners.

H.3.2.1.2.2 Meteorology

Mission planners will have electronic access to current and projected weather data, displays, and climatology databases. Planners will also have connectivity with meteorology personnel to submit requests for information, to obtain clarification, and to receive responses where appropriate. Specifically, planners will have the option to collect any weather detail available including (but not limited to): current weather and predictions, cloud cover, humidity, precipitation, temperature, particulate estimates, EOTDA, contrail levels, wind speed and directions, ducting levels, etc.

H.3.2.1.2.3 Asset Availability

Mission planners will have access to available carrier battle group asset management and availability databases. The interface will also provide planners with access to relevant off-board resource management and availability tools (e.g., National Reconnaissance Assets) otherwise unavailable to nuclear carrier (CVN), carrier airwing (CVW), and carrier battle group (CVBG) personnel.

H.3.2.1.2.4 Target Study

Mission planners will have electronic access to a target list developed and stored within the LAN architecture. The information will contain materials relevant to the specific target including source data (e.g., imagery products and intelligence) and derived data and information (e.g.,

reconnaissance aimpoints, area coverage, spot size). Planners will have access to a single threat and target database (effectiveness data derived from MCM 3-1), as well as a repository of tasking and ROE information. Planners will also have electronic connectivity with other mission planners for the exchange of, and requests for information. Should a nearby long endurance reconnaissance UAV be airborne, the mission planner will have the ability to send requests (directly to the UAV controller and/or Airwing commander) for tasking and receive approval / disapproval replies and/or digital electro-optical results expeditiously. Additionally, TAMMAC users will have the option of downloading any current digital imagery onto a mission data loader for upload and later recall in the aircraft.

H.3.2.1.2.5 Target Analysis Tools/Sources

An electronic target folder (ETF) will be available for RECCE planners early in the planning process. Intelligence personnel, data base administrators, and operators using capabilities resident in the JSIPS-N architecture will develop the ETFs. As mentioned above (Section 5.2.1.2.4), the ETF will contain available data and information [including that received from or generated by non-organic sources such as the Joint Warfare Analysis Center (JWAC) and the Naval Strike and Air Warfare Center (NSAWC)] relevant to the target of interest. Target folders will also include feedback from prior missions. In those cases where it is necessary to generate an ETF in parallel with the strike planning process, or to revise or tailor an existing ETF to meet specific strike objectives, strike planners will have electronic access to data, information, and software tools necessary to complete the target development, and reconnaissance planning process. Planners will also be able to predict performance of any RECCE sensor using the gathered target data, meteorology data, and an EOTDA module.

H.3.2.1.2.6 Friendly Situation/Disposition

The JMPS/LAN interface will enable planners to rapidly and easily access the best available sources of planning data. Current and intended disposition of friendly, allied, and coalition naval, air, and ground units will be presented on the appropriate map, chart, and geodetic backgrounds (National Imagery and Mapping Agency-NIMA products). Additional detail concerning any displayed unit will be electronically accessible via connectivity with appropriate component systems. The strike lead will also be able to determine the availability and capabilities of all national reconnaissance assets.

H.3.2.1.2.7 Enemy Order of Battle/Threat/Situation

Mission planners will have electronic access to the best available sources of planning data and the ability to filter displayed data to meet their informational needs. This capability will extend to the display of current and predicted enemy dispositions. In addition, RECCE planners will have the ability to focus on areas of high interest (e.g., target areas) and to access available national, theater, and tactical threat data. Planners will also have the ability to submit tailored queries to the threat databases to retrieve specific data elements of interest. Connectivity between planners and threat database administrators will provide for the rapid exchange of requests for information.

H.3.2.2 Create Concept Plan through Airwing Commander Approval

Concept plan development depends on the ability of the mission planning team to create missions in support of tasking. Element Leaders will be able to work in a distributed manner, each creating concept routes, then electronically passing them to the Strike Leader to aggregate into an overall strike plan.

H.3.2.2.1 Concept Plan Development Process

The development of a concept plan involves making sense of a tremendous amount of data in a short period of time. JMPS will streamline this process by providing the capability for the reconnaissance planner to collaboratively plan in a distributed manner. This will enable other planners to see the plan as it is being laid out. As a result the Strike Leader will be provided ready access to the best available sources of planning quality data.

H.3.2.2.1.1 Preparation

The Strike Leader may use the force level mission planner to display the operational picture. This picture will include the tactical area of interest (including enemy, friendly, and neutral orders of battle), Digital Terrain Elevation Data (DTED) and desired maps [e.g., Arc Digitized Raster Graphics (ADRGs), World Vector Shoreline (WVS), etc.], own forces data, and threat and target data extracted from MIDB. The strike planning team initially establishes waypoints or locations that are significant to the plan but unique to CV(N) operations. This includes tanker orbits, ingress points, target egress locations, disposition, status and intent, and special interest areas such as population centers, special operations force activity areas, international boundaries, and exclusion zones proximate to the target area. These points can be entered into the force level mission planner and used in the conceptual routing process that follows. The RECCE team will establish the preferred mission altitude profile (high- low-hi, low-low-low, hi-hi-hi, etc.) via JMPS.

H.3.2.2.1.2 Receipt of Tasking

Tasking which initiates the strike planning process will be received in the form of either an ATO or Contingency directive (or flight schedule in the training scenario). In either case, tasking will be electronically accessible within the Joint Maritime Command Information System (JMCIS)/LAN architecture. Upon receipt of tasking, a Strike Leader will be selected and assigned. He receives the tasking, background data and materials, Commander's Guidance, and relevant information. The Strike Leader, via a JMPS terminal, will review his tasking and assemble his strike planning team to perform the required mission planning. The Strike Leader reviews the tasking with the team, assigns planning responsibilities, establishes a timeline with milestones for developing the required Concept Plan, and releases the team members to proceed. JMPS will allow the Strike Leader to electronically task individual element missions (including electro-optical reconnaissance, or RECCE team insertion/extraction) using mission data from the tasking sources.

H.3.2.2.1.3 RECCE Package Development

Reconnaissance planners in each of the individual mission areas (e.g., TARPS/ATARS, UAV, Special Operations) will begin the conceptual planning process in parallel using a set of distributed collaborative planning tools, accessible from the JMPS terminal that allow data sharing. As each

element leader completes his/her detailed plan, the plan will be stored for electronic retrieval by the Strike Leader who will be able to merge all reconnaissance plans together with other missions.

H.3.2.2.1.3.1 Electro-optical Reconnaissance Missions

The Electro-optical Reconnaissance planner extracts missions from the ATO. If these routes are straight-line routes, the planner may choose to further define the routes. With additional definition, the route begins to shape the general picture for the reconnaissance plan. Additionally, the planner will be able to determine the flight profiles which will optimize the electro-optical imagery quality while minimizing the platform's vulnerability to the surface or airborne threat. The RECCE planning process will include photographic spot size and exposure predictions, area coverage, SAR predictions, radar horizon and shadowing. Additionally, EOTDA will utilize downloaded meteorological data and make lighting, sun angle and shadowing predictions . The profiles can be then further refined using a digital downlink performance prediction subroutine which can be tailored to a specific platform / RECCE transmission device. The reconnaissance planning module will be versatile enough to cover all planning aspects specific to ATARS, TARPS, and any reconnaissance functionality that the Joint Strike Fighter (JSF) might adopt. A detailed tactical plan can also be developed including timelines and decision/action points via direct access to such digital publications as TACMANs, Top Gun Manuals, MCM 3-1, weaponeering modules, and NATOPS publications.

H.3.2.2.1.3.2 UAV Missions

Similar to electro-optical reconnaissance, the UAV mission planner will extract missions from the ATO. If these routes are straight-line routes, the planner may choose to further define the routes. With additional definition, the route begins to shape the general picture for the reconnaissance plan. Additionally, the planner will be able to determine the flight profiles which will optimize the photographic imagery quality while minimizing the platform's vulnerability to the surface or airborne threat. If a previously launched long duration UAV is airborne and untasked, any mission planner (strike, RECCE, etc.) should be able to send requests directly to the UAV controller or Airwing Commander. If the additional tasking is approved, the UAV controller should be able to quickly route-plan using JMPS, and command the UAV to execute the new tasking. This capability should apply to all UAV models [i.e. Pioneer (United States Navy-USN, 4.5 hr endurance), Hunter (United States Army-USA, 12 hr), Predator (United States Air Force-USAF, 20 hr), GNAT 750 (USAF, 40+ hr), Exdrone (United States Marine Corps-USMC, 2.5 hr), Outrider, Global Hawk, Darkstar, etc.] , especially the longer duration ones. Additionally, the downloaded digital imagery/video should be made available near real-time to any strike mission planner. A detailed tactical plan can also be developed including timelines and decision/action points via direct access to such digital publications as TACMANs, MCM 3-1, and NATOPS publications.

H.3.2.2.1.3.3 Special Operation (RECCE Insertion/Extraction) Missions

Again, as in electro-optical reconnaissance, the Special Operations mission planner will extract missions from the ATO via TSCM, or via verbal agreement between the SEAL team and the squadron. If these routes are straight-line routes, the planner may choose to further define the routes. The planner will be able to access threat data bases from current intelligence, generate a proposed SEAD plan and a fighter escort plan, and find insertion/extraction points that do not

exceed the acceptable threat level. The planner will also be able to provide suitable landing and cover for the insertion/extraction aircraft, and plan for cover and proximity to the objective for the Sea-Air-Land (SEAL) squad (if required). Finally, the insertion/extraction lead will be able to incorporate serpentine routing in order to plan spider points based on launch point and insertion/extraction point for the given threat and terrain data. The crew will then generate a preferred route and be able to coordinate that route with the F-18's, F-14's, and JSF to ensure protection for the package.

H.3.2.2.1.4 Strike Coordination and Deconfliction

The Strike Leader will identify when and where conflicts, fratricide, and collisions may occur. When offending missions are identified, the Strike Leader will perform deconfliction within his strike plan and notify Element Leaders of the modifications using a distributed collaborative planning capability. Information and displays constructed in the development of the strike concept will be of great use to the planning team in performing the final review.

H.3.2.2.1.5 Evaluation and Assessment

The Strike Leader can evaluate his strike plan using tools embedded within the strike coordination module. The tools available to him will include a graphic preview of missions in the plan, an assessment of SEAD performance, expected reconnaissance success, a tanker summary, and a compilation of the number of assets (aircraft and weapons) used to conduct the strike.

H.3.2.3 Create Aircraft Data Loads

The production of aircraft data loads will be a by-product of the RECCE planning process. Once the strike plan is approved, appropriate data can be electronically transferred to the data loaders from the appropriate platform. Mission data loaders will be tailored to a specific platform to accommodate Global Positioning System (GPS), TAMMAC imagery, flight plans, Link 16, ARC-210, overlays, etc.

H.3.2.4 Sortie Rehearsal

Toward the end of element planning and before the overall strike briefing, sortie rehearsal will be an important aspect of building mission familiarization and situational awareness. Following the determination of element route profiles, the sortie rehearsal module will simulate a mission "fly-through" to provide a cockpit view of the terrain and the threat to be encountered during strike execution. Aircrew will be able to rehearse element execution and build visual familiarization with the flight profile, threat, terrain, target approach, and weapons release point.

Using the sortie rehearsal module, aircrew will be capable of electronically receiving mission route, threat, and target data directly from JMPS. Route data will consist of both position and timing data. Threat and target data will contain threat envelopes, terrain, and troop positions. The sortie rehearsal module will overlay these data on its imagery database in a manner that allows 3-dimensional views and fly-throughs of the ingress, egress, and target areas. Aircrew will be able to select cockpit view profiles for each element of a strike – including the RECCE platform(s). As rehearsal time may be short, the imagery database of the sortie rehearsal module

will permit multiple, simultaneous rehearsals to better accommodate the periodically high demand for this capability.

In addition, an onboard capability will be provided to update the imagery database of the sortie rehearsal module while deployed utilizing recently gathered digital electro-optical reconnaissance imagery. This will consist of the appropriate connectivity between the imagery processing systems and the sortie rehearsal module including tools for splicing imagery updates into the database. Assessments of quality will also be conducted prior to including imagery into the database. These assessments will consider such things as cloud cover, resolution [(National Imagery Interpretability Rating Scale (NIIRS)], and image angle (low oblique views may distort the database). The imagery database will be kept current via an ongoing process of splicing high quality imagery additions and updates.

H.3.2.5 Flight Brief

Overall strike briefings will be conducted using the same automated systems for viewing at remote locations. The Strike Leader will use JMPS to augment his/her electronic presentation of graphics and text that were developed during the planning process. Presentations from AI and Meteorology representatives may be given "live" via electronic connection from remote Integrated Video System (IVS) sites. The briefing will be interactive, with feedback from remote strikers occurring via a secure video-teleconferencing capability.

In a similar manner, element briefings will also be electronically conducted. These briefings will likely have a smaller audience, however. Aircrew flight briefs will continue to be face-to-face meetings, but will make greater use of the sortie rehearsal module. During man-up of aircraft, aircrew will physically connect the data load units to the aircraft and/or weapons for data up-load.

H.3.2.6 Debrief, Assess, and Nominate Follow-on Tasking

As part of the strike planning folder format, the results of the strike will become a part of the electronic folder to capture the specifics of the execution. Information added to the strike planning folder from the aircraft executing the strike and from the post mission debrief will include TARPS DI, ATARS, UAV imagery, and national sensors with the capability to transfer this imagery to the JSIPS-N strike planning archive.

These provisions will create a repository of information detailing both the planning and the execution and results for analysis and review, as well as building a database of strike tactics and employment details on which future plans can be built. By accessing previous strike planning folders, this historical database can be used at the outset of strike planning for a review of lessons learned and previous strikes with similar factors (decreasing the requirement to "reinvent the wheel"). As a debrief tool for use in reviewing strike execution post mission, the above data elements that are added to the strike planning folder will be available for viewing on JMPS LAN.