CHAPTER 1

INTRODUCTION

1.1 Purpose.

This is a guide for Within JOA commanders, operational mission planners, tanker aircrews and tactics personnel at all levels of command. It provides a basis for sound decision making, and it is the primary reference source for planning worldwide tanker missions at the outside JOA, operational, and tactical levels. Tactics presented are solely for employment and planning considerations. They are intended for the purpose of employment standardization.

1.1.1 General Perspective. Tankers are considered as High Value Airborne Assets (HVAA) The lost of one of this assets could affect deeply to the success of operations. Project the air power over greater distances or concentrate where and when it is most needed are the primary focus and use of the tankers. AAR assets may be fixed-wing or rotary-wing aircraft that may be equipped with a probe/drogue, a boom or both. While AAR offers greatly enhanced flexibility and capability to air forces, there are important limitations concerning tanker availability, interoperability, the time taken to refuel, the volume of airspace required for AAR and the need for control and protection of that airspace to ensure mission success and to prevent losses due to accident or action by an adversary.

1.1.2 Organization. This volume is organized in such a manner that general and tanker information is provided for all users Attachments have been provided as a reference for all users.

1.2 **Responsibilities**.

1.2.1 Commanders Review.

1.2.1.1. SACT.- Is responsible to develop, implementation and updating this manual.

1.2.1.2. SACEUR. Is responsible of application of this manual. He will establish the MOB and will appoint the tankers, after the Transfer of Authority (TOA) of the nations, to their MOB. SACEUR is also responsible of the coordination of AAR inter theatre operations.

1.2.1.3. JFC[1] are responsible of the application of these concepts in their planning. They will assign the role to the assets. And they will be responsible of the integration of the air operations in joint operations.

1.2.1.4. ACC[2] is responsible to carry out air operations, he conduct, through CAOC, the air campaign and integrate AAR operations in Air Operations. He will conduct theatre AAR operations. Allocation of theatre AAR assets will be proposed by the ACC in light of the JFC's apportionment decision and the overall campaign objectives.

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[1] JTC is a generic name that involves AFNORTH, AFSOUTH and CJTF Commander.
[2] ACC is a generic name that involves AIRNORTH, AIRSOUTH and CJFACC.

1.2.2. Combined Air Operations Center (CAOC)

CAOC is responsible to tasking AAR operations and perform and delivery the Air Operations Order (ATO) paying attention to the concepts stated in this manual.

1.3 AAR Operations.

The objective of AAR operations is to enhance combat effectiveness by extending the range, payload or endurance of receiver aircraft. It allows air power to be projected over greater distances or concentrated where and when it is needed the most. To achieve operational effectiveness there must be compatibility in terms of equipment (e.g. boom vs. drogue), airborne procedures and aircraft performance between AAR aircraft and receivers. Outside JOA AAR supports the deployment of forces to theatre whilst theatre AAR provides support to units operating in theatre.

1.3.1 AAR in support Outside JOAair operations. Air refueling extends the range of the deploying aircrafts, allowing nonstop flights and a more rapid response to a regional crisis. Outside JOA AAR includes the support to Global Attack, Deployment and Air Bridge missions, . Generally, outside JOA AAR assets, like outside JOA air transport assets are nationally owned and controlled. Outside JOA AAR is coordinated by the theatre air mobility element.

1.3.2 AAR in support within JOA AAR air operations. This support activity has required the highest utilization of the tanker force. It also presents planners and executors with the highest degree of mission ambiguity due to the asymmetric and dynamic environment in which air refueling will be accomplished. Tanker missions in support of a specific Area of Responsibility (AOR) may operate entirely within the Within JOA, beyond Within JOA boundaries or beyond the Forward Edge of the Battle Area (FEBA) over hostile lands. Tactical considerations for each situation may vary markedly depending on the needs of the AOR and Within JOA combatant commander. **.** Theatre AAR operations will be planned by the ACC and issued as an integral part of the ATO. An AAR team consisting of staff officers with specific AAR expertise will plan, coordinate, manage and monitor all aspects of AAR operations.

1.3.3. Special Operations Support could be performed at outside JOA AAR level or at Within JOA AAR level, it will depend on the authority (NATO or National) that supports the operation.

CHAPTER 2

MISSION PLANNING CONSIDERATIONS (U)

2.1 General.

This chapter provides guidance and considerations for AAR operations planning from the operational level, to the unit level, and to the aircrew level. Information is placed under the following three topics: Command and Control; General Mission Planning Considerations; and Threat Planning. This chapter is not inclusive to all considerations for specific missions.

2.2 Command, Control and Coordination.

Generally, outside JOA AAR assets, like outside JOA air transport assets are nationally owned and controlled. Outside JOA AAR is coordinated by the theatre air mobility element. Theatre AAR operations will be planned by the ACC and issued as an integral part of the ATO. An AAR team consisting of staff officers with specific AAR expertise will plan, coordinate, manage and monitor all aspects of AAR operations.

2.3 General Mission Planning Considerations

2.3.1 Main Operating Base/Tanker Beddown.

Tanker aircraft should be operated from bases located to ensure survivability of refueling assets on the ground. The tanker Main Operating Base (MOB) also needs to be close enough to provide a reasonable transit time to the refueling tracks. This will optimize alert response time and off-load capability without unnecessary exposure to the threats. Optimizing beddown can reduce the number of tankers required to support operations.

2.3.1.1 Force Sizing. Factors that drive force sizing will be based on the AAR requirements of the operations. Tanker employment needs to be effective supporting operations in both the outside JOA AAR and theatre AAR while considering efficiencies in overall tanker employment. There is a balance between crew ratio and tails based upon average sortie duration. In other words, you can match the number of crews and tails so both are used to the effects required. In **Table** 2.1, this balance between Average Sortie Duration (ASD) and crew ratio is reflected.

Table 2.1 Aircrew Management.

SD (Hours)	Aircraft Cycle (Hours)	Aircraft Sorties/Day	Aircraft Hrs/Day	Aircraft Hrs/month	Crews 110 Hrs/Month	Crews 125 Hrs/Month	Crews 150 Hrs/Month

2.3.1.2 Aircraft Turn Time. Standard planning factors normally require the time for maintenance to regenerate a tanker. This includes time for fueling, cargo loading, and minor maintenance. Changing configuration of tankers to install/remove WARP, MPRS, or Boom-to-Drogue Adapter (BDA) will require additional time.

2.3.1.3 Operating Locations. In order to maximize both effectiveness and efficiency, transit times should be minimized.. This helps manage monthly flying hour limitations. In addition, being close to AAR areas increases the amount of fuel available for offload, and more sorties to be flown in a day. Increasing the offload available on each tanker may reduce the number of tankers required to support operations and enable crews/tails to be released. Decreased transit time is very important to the timely response of ground alert tankers. Flying hour waivers will be critical to determining crew ratios needed to support operations.

2.3.1.4 CAOC/C2. Force sizing will be determined by meeting receiver requirements. Tanker operation locations should be looked at from a Within JOA wide perspective to ensure optimized refueling operations. Planners must take into account future levels of tanker support required to allow lead-time for additional assets to be requested, approved, and deployed into Within JOA.. Just as important, if there is excess tanker assets/crews above requirements, every effort should be made to release them from the Within JOA.

2.3.1.5 Unit Level. Nations will report to NATO in the TOA about the number of sorties and time that can be flown, the CAOC/C2 will take in consideration the number of sorties that can be flown. Factors that affect this number should be relayed ASAP as the planning process for future missions may be in progress.

2.3.1.6 Fuel. Fuel availability may drive tanker-basing requirements. Early coordination with Logistics early in the Within JOA development is critical. Because of the large amounts of fuel to sustain tanker operations, very few locations other than prepared military airfields and international airports will be able to maintain and sustain high-volume tanker operations. Coordinate with the host airfield to ensure a large quantity of fuel is readily available. A system must also be in place to transfer the fuel from the fuel storage facilities, to the airfield, and then to aircraft. The most efficient and preferred method of transferring fuel into the aircraft is rollover pits/hydrant refueling. Fueling with trucks greatly increases the dependency on host airfield resources and will increase turn times considerably. See Annex A, “Aircraft and Systems Capabilities and Limitations,” for detailed fuel information.

2.3.1.7 Ramp Space. The location selected for tanker operations must have a large aircraft-parking ramp. Tactical threat considerations may require additional ramp space to separate aircraft ensuring survivability of the fleet. See Annex A, “Aircraft and Systems Capabilities and Limitations,” for more information.

2.3.1.8 Runway. Runway length, climatic conditions, and departure obstacles affect the amount of fuel a tanker can takeoff with and subsequently off-load/loiter. Refer to Annex A, “Aircraft and Systems Capabilities and Limitations,” for more information.

2.3.1.9 Approach Consideration. All weather operations are enhanced by compatible navigation aids (navaids). Desired minimum is non-precision approach capability via TACAN, VOR, GPS , or air surveillance radar (ASR) approach. Optimum capability would include precision approaches via ILS or precision approach radar (PAR). Availability of approach types could impact beddown selection depending on weather considerations.

2.3.1.10 Weather. Planners and aircrew should consider the meteorological conditions for the route of flight during the weather briefing.

2.3.1.11 Nuclear, Biological, Chemical and Radiation (NBCR). Planning considerations

pertaining to Weapons of Mass Destruction (WMD) include potential threats to home station or the Forward Operating Location (FOL). Unit planners and aircrews should be prepared to operate in an NBCR environment. Planners should consider moving mission planning/crew processing areas to an uncontaminated zone. This process will add considerable time to the aircrew report time and create challenges in providing the crews with mission materials and briefings.

2.3.1.12 Aerospace Ground Equipment (AGE). Depending on the size and length of deployment, other airfield requirements may include aircraft generation equipment such as oxygen, nitrogen, power/air carts, deicing equipment, and cargo loaders suitable for AAR assets. Depending on the location and time of year snow removal equipment must also be available. Additional support may also include billeting, transportation, and dining facilities. Host nation support of these items may be limited.

2.3.2. Combat Search and Rescue (CSAR).

Thorough knowledge about CSAR procedures is required. The permission intelligence briefing provides up-to-date CSAR information, including CSAR call signs, authentication procedures, and disposition of ground forces call signs and authentication procedures are also found in the Within JOA SPINS. Use all available CSAR information and intelligence support when developing the evasion plan of action (EPA).

2.3.2.2

2.3.3. Air Refueling Planning Considerations.

NATO AAR planning factors vary for specific receiver aircraft. As a general rule, the best altitudes to conduct AAR when considering receivers range between FL 200 and FL 300. Power limited aircraft may require AAR altitudes between 10,000 and 20,000 feet MSL. AAR speeds vary dramatically between different receiver types. If multiple receiver types must be sent to a single tanker at the same time, all receivers on that tanker must have comparable AAR speeds and receptacles.

2.3.3.1 Rendezvous Procedures. According to ATP-56 there are the following procedures:

2.3.3.1.1. Rendezvous A. RV A is a procedure carried out under the control of a radar station based on the ground, seaborne or airborne (AEW). It is normally used to vector receivers to tankers operating in an AAR Anchor area but may be used as required in any situation.

2.3.3.1.2. Rendezvous B. RV B is a heading based procedure and is thus ideally suited for situations where accuracy of the navigation equipment of the tanker or receiver is in doubt or degraded. It has a further advantage in that is not required a prebriefied AAR track. However, for prebriefed task a RVIP, the receiver's inbound track and a RV control time are normally designated. This procedure caters for non-AI radar equipped receivers; it is also very suitable for large or battle-damaged receivers, because the tanker performs all turns during the procedure. As this procedure is heading rather than track based, it may not be suited to a busy ATC environment.

2.3.3.1.3. Rendezvous C. RV C is a heading based procedure and is thus ideally suited when accuracy of navigation equipment is in doubt or degraded. It does not required pre-briefed AAR track. However, for prebriefed task a RVIP, the receiver's inbound track and RV control time are designated. It requires the receivers to use AI radar to complete the RV. As this procedure is heading rather than track based, it may not be suited to a busy ATC environment.

2.3.3.1.4. Rendezvous D (Point Parallel). RV D is an offset rendezvous based on a common track.

2.3.3.1.5. Rendezvous E. RV E should be wed in tactical situations where it is necessary to have available a tanker with which receivers can rendezvous in a known area on an opportunity basis. Is normally used to support CAPs and is particularly appropriate when EMCON procedures are in force.

2.3.3.1.6. Rendezvous F. RV F is normally used in VMC conditions when the tanker and receiver(s) are operating from the same airfield. Tanker and receiver take-offs occur within racetracks of the other rendezvous procedures. The collocated procedures have the added advantage that it is usually possible for the tanker to delay its take-off until assured of the receiver's serviceability on start up. However, adverse climb out weather to ATC considerations may make these procedures impracticable. There are two methods of effecting this procedure: Accompanied Departure / Buddy climb and Tailchase Departure.

323.3.1.7. Rendezvous G (En Route). RV G procedure is used when a join up is to be accomplished en route to an AAR track to join an ALTRV or an established military corridor. The tanker(s) and receiver(s) navigate independently to arrive at the RVIP at a designated RV control time.

2.3.3.2 Communications/Rendezvous (CR). A good CR plan improves the flow of AAR. Basic considerations when creating a CR plan are as follows: dedicated AAR and C2 frequency.

2.3.3.1.3.1 Dedicated AR Frequency. CAOC will coordinate a dedicated primary frequency with a secondary frequency to ensure that jamming platforms do not interfere with these frequencies.

2.3.3.1.3.2 Dedicated C2 Frequency. Make a dedicated C2 frequency available so that the tanker has direct contact with the controlling agency. Threat information should be passed on C2 frequency.

2.3.4 Receiver Cycle time.

Air refuelling planners must include time for receiver aircraft to complete the rendezvous and take on the scheduled offload. Receiver cycle time is defined as the time required to move from the observation position into the contact position, receive fuel and return to the observation position. Consider the boom/drogue cycle time as receivers on-load fuel at different rates due to aircraft plumbing or restrictions on the number of pumps the tanker can use to refuel.

2.3.5. Airspace.

2.3.5.1Airspace Control Methods. There are two methods of air space control; they are positive and procedural control. Procedural control is preferred because it simplifies deconfliction. However, crews will also fly under positive control. A combination of the two will be used in airspace planning. When positive control is not possible, procedural methods must be in place for tankers and receivers to fly safe operations.

2.3.5.1.1 Positive Control. This is a method of airspace control that relies on positive identification, tracking, and direction of aircraft within airspace, conducted by electronic means (Examples: AWACS, CRC, Air Traffic services). Positive control requires continuous monitoring to ensure deconfliction.

2.3.5.1.2 Procedural Control. Procedural control is a method of airspace control that relies on a combination of previously agreed on and promulgated orders and procedures. Procedural control is the most effective method for ensuring deconfliction of aircraft in an EMCON/jamming environment. It adds predictability to tanker operations and reduces the workload on radar controllers. Procedural control should be followed and planned for at all levels. Procedural control methods will be written in SPINS, ACP/ACO, and host nation aviation regulations.

2.3.5.2 Airspace Control Guidance. References used in NATO are the following:

- AJP 01(B) Chapter 10. Airspace Control.
- AJP 3.3 Joint Air & Space Operations Doctrine. Chapter 3, Paragraph 305. ACA and ADC designations
- AJP 3.3.5. Doctrine for Airspace control in times of crisis and war..

2.3.5.3. Aircrews. Aircrews are ultimately responsible for utilizing “see and avoid” procedures because ATC may be extremely limited, easily saturated, or nonexistent. AWACS/GCI control may provide flight following but may not be able to guarantee traffic separation. Aircrews may be required to fly “due regard” utilizing “see and avoid” criteria.

2.3.5.4 Airspace Track Planning.

2.3.5.4.1 Track Sizing. The objective of tanker air refueling track placement is to maximize off-load capabilities while minimizing risk. Plan air-refueling tracks outside threat engagement zones to the maximum extent possible. Proximity of the tanker base to the refueling track can have a significant impact on tanker off-load capability and, therefore, the number of tankers required. Anchor AAR legs should be a minimum of 20 NM in width and 50 NM in length. Within JOA airspace and tactical situation may require smaller anchor legs. The minimum separation should normally be 4,000 feet between single-ship tankers. Separate tanker formations by 4,000 feet between the highest aircraft in the lower cell and the lead aircraft of the next higher cell. Single-ship heavy refueling requires 3,000 feet between tankers. To ensure safe separation of refueling formations, plan a minimum of 1,000 feet between AR altitude blocks. The AR track should be designed with 1,000 feet above the highest tanker and at least 2,000 feet below the lowest tanker.

2.3.5.4.2 Airspace Planning. Responsibilities. The ATC structure should be able to support the desired route planning. If planning cell formation, airspace must be compatible and/or reserved. Host nation procedures will play a factor. Prior planning/permission may be required to operate non-standard cell formation. Weigh political and tactical considerations

against risks and threats. Controllers can aid operations by assisting in rejoins and providing threat calls. Also, consider arrival and departure corridors and procedures. Use the arrival/departure plan that best suits the objective, tactics, and local restrictions.

2.3.5.4.3 Formation Considerations. Additional coordination and mission planning are necessary when formations operations are conducted. In a threat environment, weigh costs against gains when planning formation sorties. Benefits include quicker off-loads, in-flight spares, and mutual support. The two-ship tanker cell is the most flexible formation for AAR operations. Larger formations may be used to maximize offloads. Mixed tanker formations are operations that combine two or more dissimilar tanker aircraft. Mixed tanker formation departures require in-depth planning and formation briefings. When conducting mixed tanker formations with alliance tankers a large amount of coordination will be required.

2.3.5.5 "Due Regard". If ATC structure does not lend itself to the mission requirements, then consider "Due Regard" during mission planning. Planners and aircrews must have a thorough knowledge of "Due Regard" procedures and then carefully plan accordingly As a rule of thumb, do not fly Due Regard unless thoroughly planned and briefed before step time.

2.3.5.6 Deconfliction. Planners and aircrew members must ensure they are properly deconflicted throughout their route of flight and separated by time, space or altitude from all other aircraft. Proper deconfliction procedures prevent fratricide and ensure mission success. Consider using TCAS, if available, in all phases of flight to help ensure positive aircraft separation, emissions control (EMCON) permitting.

2.3.5.6.1 Main Operating Base (MOB). MOBs can be extremely busy places. As such, aircrews need to know that arrival/departure procedures have been scrubbed for deconfliction problems. This is especially pertinent if tankers are operating differently than other military/civilian aircraft at the MOB. In addition, care must be given to ensure tankers are operating in accordance with safe passage procedures into and out of the MOB (See Safe Passage procedures 3.3.5.6 this section, for more information).

2.3.5.6.2 En Route. Deconfliction during en route phases of flight includes considerations such as hemispheric altitudes, airspeed requirements/limitations, civilian traffic and ATC requirements. Planners/aircrew should ensure they fly according to the international air traffic rules is there is not an indication of the ATC, in this sense crews would have available flight information updated, such maps, standard procedures and NOTAMS.

2.3.5.6.3 (U) ACC Joint Operations Area (ACC JOA). Military operations in the ACC JOA can be very dynamic. Planners/aircrew must completely understand the positive and procedural controls for ensuring separation in an Air JOA. If there are deconfliction problems, this must immediately be brought up to the C2 authority for resolution. During every phase of flight in an Air JOA, tanker aircrews must know what procedures to follow if positive control is not available..

2.3.5.7 Safe Passage Procedures.
Safe passage procedures are listed in the SPINS, ACO, or ATO. When flying inter-Within JOA missions crews must ensure compliance with applicable safe passage procedures in the arrival ACC JOA . These procedures normally have minimum risk routing associated with them.

2.3.5.8 Proper use of IFF/SIF. SIF equipment (as directed by Within JOA SPINS/ATO) is essential for aircraft identification. Failure to squawk the proper modes and codes will increase the chance of engagements by friendly aircraft and SAM systems. IFF/SIF procedures may include Mode 4, Mode 1 changeovers, rolling Mode 1 or Mode 3, or correlation of Modes 2 and 3.

2.3.6 Communications Planning.

2.3.6.1 Connectivity. All the ways of communications are open in order to get a clear idea about the planning, a detailed communication planning must be stated in the operational plan.

2.3.6.1.1 Telephone. . Telephone will be the more instantaneous and fast way to solve any problem that could cause misunderstanding, but it is not possible to assure the security of the information transmitted or received. Phone not will be used in those cases that the information was related with a higher level to sensitive.

2.3.6.1.2 Secure. Secure line will be used in those cases that the information transmitted or received has a level higher than sensitive.

2.3.6.1.3 Radio Connectivity. Except those cases established in EMCON plan, on flight information will be broadcast.

2.3.6.1.4 Have Quick/Secure Voice Radio. Many NATO tanker aircraft are equipped with UHF HAVE QUICK II and secure voice radio communications. Secure Voice can be layered with HQ to provide the most secure communications available. HQ alone is not a secure means of communication.

2.3.6.2.5 Deception Planning. Military Deception (MD) may be used in tanker operations. A Military Deception Officer (MDO) will plan and coordinate MD operations involving tankers. These plans will be coordinated with Within JOA MDOs. Tanker planners must be prepared to assist in the building/execution of MD plans.

2.4 Threat Planning.

When operating close to threats, tanker operations must be planned to avoid/deny those threats. This section provides broad guidance for tanker planners and crewmembers when dealing with threats. Specifically, it addresses two entities, intelligence and force protection, that provide support to ensure threat avoidance. Knowledge of threat location and capabilities guides planning. The widespread proliferation of advanced weapon systems increases the threat to tanker operations.

2.4.1 Intelligence.

Intelligence and planners should work hand-in-hand to ensure tankers are operating in safe airspace. Intel will be the biggest provider of threat information.

2.4.1.3 Application. Use the latest intelligence to determine capabilities, limitations, and locations of known threats. Aircrews may not know the exact threat location but can employ

tactics based upon the type of threats in the general area. Planners must work with intel to ensure tankers are planned outside of these threats. Intel is most capable in helping planners determine locations and capabilities of the following threats (see chapter 8 for more information):

- Airborne Interceptor (Al)
- Anti-Aircraft Artillery (AAA)
- Surface-to-Air Missiles (SAM)
- Naval Surface Combatants
- Lasers
- Electronic Combat Systems.
- GPS Jamming/Spoofing (see note below for additional GPS information)

2.4.1.4 GPS Considerations. GPS is ideal for optimum tanker operations. Ensure the planned operating base is free of enemy GPS jamming and unintentional jamming from sources in addition to intelligence such as commercial broadcast facilities. Contact GPS support center or Space Liaison Officer (SLO) in the CAOC, for specific details on current status of GPS constellation to include forecast accuracy predictions. Information is also included in ATO SPINS. Crews should crosscheck navigation solutions frequently and back up navigation by other means including visual references.

2.5. Force Protection.

In addition to intel, planners must work closely with force protection assets at Main Operating Bases (MOB).

CHAPTER 3

AAR in support of OUTSIDE JOA air operations

3.1 Overview. Outside JOA support is escorting and air refueling aircraft during deployments and transits between different areas of operations/responsibility . Air refueling extends the range of deploying aircrafts allowing nonstop flights and a more rapid response to a regional crisis. The capability of assets to fly nonstop to a JOA/AOR eliminates the need to obtain landing rights in non-alliance countries. Tankers that carry cargo and passengers on refueling missions are termed 'dual role' tankers. Dual role tankers are especially useful during deployments. Since take-off fuel is limited by the amount of payload carrier, air-to-air refueling aircraft operating in a dual-role may require force extension.

3.2 Control and Co-ordination.

Generally, AAR assets supporting outside JOA air operations, are nationally owned and controlled. Outside JOA AAR is coordinated by the theatre air mobility element. It will coordinate both outside JOA and theatre air transport operations for inclusion into the ATO and ACO, develops Special Instructions (SPINS) for aircrews as necessary, and requests airspace and air transport slot times.

3.3. Intelligence.

Intel needs to be gathered and briefed to aircrews regarding threats that exist at the location. Threats will be disseminated as soon as possible in order for the aircrews to incorporate changes into their mission planning (i.e. changing arrivals/departures).

3.4. Crew Requirements

Aircrews are responsible for being able to adapt to dynamic environments and changing situations due to updated MANPAD threats in the terminal area.

3.4.1. **Force Protection.**

Force Protection is the responsibility of the. Aircrews need to be aware if there is a Force Protection plan in place and follow the procedures accordingly. The national commander responsible for Force Protection usually is not the operational commander.

3.4.2. Prior to entering an ACC's AOO, the aircrew will need to reference –the Within JOA AAR for further aircrew responsibilities.

3.4.3. The use of the latest intelligence on capabilities, limitations, and locations of threats must be utilized. It is equally important that crews understand friendly support availabilities, capabilities, and weaknesses. Intelligence study and threat knowledge cannot be overstressed.

CHAPTER 4

AAR in support of WITHIN JOA air operations.

4.1 Overview.

4.1.1 The Within JOA AAR mission provides AAR to a specific Area of Operations (AOO). The Within JOA support role will typically have the following attributes:

- Tactical considerations for each situation may vary markedly, depending on the needs of the AOO and commander.
- Support requirements are based upon priorities established by the Joint commander assessed by air component commander (ACC). In order to facilitate their mission, National TOA to NATO may gives to JFC operational control over the deployed tankers.
- Within JOA operations involve missions in a highly dynamic environment.

4.2 Command and Control.

4.2.1 Air Component Commander (ACC).

Theatre AAR operations will be planned by the JFACC and issued as an integral part of the ATO. An AAR team consisting of staff officers with specific AAR expertise will plan, coordinate, manage and monitor all aspects of AAR operations.

Allocation and apportion of theatre AAR assets will be recommended by the ACC in light of the JFC's apportionment decision and the overall campaign objectives. AAR assets may be fixed-wing or rotary-wing aircraft that may be equipped with a probe/drogue, a boom or both.

The ACC is responsible for employing air assets during contingency operations. The JFACC is from the military branch with the preponderance of air and space assets with the means to control and direct their employment. .

4.2.2. Combined Air Operations Center (CAOC).

The CAOC provides operational-level C2 of aerospace forces and is the focal point for planning, directing, and assessing aerospace operations.

4.3 Operational Level Planning/Direction.

Operational level planning/direction is accomplished by the ACC and tasked by CAOC.

4.3.1 General.

When an CAOC is formed, an Air Refueling Control Team (ARCT) within the CAOC will normally coordinate employment of AAR assets. The ARCT is responsible for planning and tasking all AAR missions employing tankers attached to the JFC. The ARCT is also responsible for integrating these missions into the ATO. Within JOA planners should consider aircrew level tanker aircraft tactics and maneuvers as part of a comprehensive defensive plan. A detailed plan—coordinated with air base defense, DCA assets, and command and control elements—that is easily understood will minimize confusion and maximize effectiveness.

4.3.2 Mission Planning Considerations.

4.3.2.1 Products. The Air Tasking Order (ATO), Airspace Control Order (ACO), and Special Instructions (SPINS) are developed at the CAOC and used to communicate the air plan to the WOCs, and ultimately to the aircrews who will conduct the missions. A thorough understanding of the ATO, ACO, and SPINS is critical for successful mission accomplishment.

4.3.2.1.1 Air Tasking Order (ATO). The ATO is the final product in the CAOClevel planning process. It lists mission details required for planning and execution such as call sign, IFF codes, assigned air refueling track(s), and receivers, as well as any daily SPINS that provide additional guidance for mission execution. The ATO provides the details for wing and squadron level planning.

ARCT will task the AAR missions giving enough time to flight crews and ground teams to prepare them..

4.3.2.1.2 Airspace Control Order (ACO). The ACO is normally transmitted along with the ATO and lists the details of airspace coordination required for successful ATO execution. The ACO is derived from the airspace control plan (ACP). The ACO lists such items as minimum risk routing (MRR), no-fly areas, various engagement zones, AR track information, entry/exit procedures, ingress/egress routes, and other pertinent data for both air and ground personnel who need to understand how the airspace will be used. The tanker planner needs to ensure that the SPINS/ACO support smooth AR operations.

4.3.2.1.3 Special Instructions (SPINS). These instructions give general guidance for accomplishing the ATO. In addition to daily SPINS published with the ATO, the CAOC will normally publish weekly, monthly, and/or quarterly SPINS and possibly standing Within JOA SPINS, which include items less subject to change. As a general rule (though not inclusive), the following items should be addressed in the SPINS:

- Rendezvous and Air Refueling Procedures.
- Air Defense and Safe Passage Procedures.
- Within JOA communications plan
- Ingress/Egress procedures for ACC AOO including C2 agencies and frequencies.

- Procedures for IMC conditions.

4.3.2.2 Formation Considerations. Planners should carefully consider airspace limitations, receiver requirements, and possible threat reaction maneuvers before employing tanker forces in formations larger than two ships. Formation station keeping becomes more difficult as the number of aircraft in formation and/or EMCON level increases. When flying mixed tanker formations, consider individual tanker weight and performance characteristics. Planners and executors need to understand that mixed tanker formations can increase scheduling flexibility however; formation departures require in-depth planning and formation briefings.

4.3.2.3 Emission Control (EMCON) Planning. During planning for a Within JOA support mission, CAOC planners need to determine the proper emission level for safe and efficient AAR operations and communicate this to the crews via the SPINS.

4.3.2.4 Standard Fuel Terminology. In order to address past problems with fuel management techniques the following procedures have been coordinated. When operating in an AOR or during an exercise, standard fuel terminology will be defined in the Special Instructions (SPINS) or other directives. This ensures that tanker aircrews are reporting correct numbers to C2 elements when polled. Tanker CAOC planners must ensure standardized fuel terminology is coordinated with C2 elements prior to operations onset to avoid confusion.

4.3.2.5 Distance to Threats. Tanker aircraft may need to operate close to threat rings. However, tanker aircraft do not have defensive systems and must stay outside of surface-to-air threat reaching . The proximity of air-to-air threats must also be considered in the tanker protection plan. However, crews must be aware in-flight re-tasks may place tanker assets within an area of increased threat.

4.3.2.6 Air to Air Refueling Planning. Due to the diversity of AAR missions, each air to air-refueling mission has its own unique set of requirements, which demand careful review by planners and aircrew. Missions may require cell formation due to the large offload requirements or push timing for a large number of receivers.

4.3.2.6.1 Air Refueling Profiles. AAR must be conducted at airspeeds and altitudes compatible with the receiver's mission profile, configuration and system. To accommodate heavily loaded fighters, pre-strike AAR may be well below optimum refueling altitudes.

4.3.2.6.2 Air Refueling Track Planning. AAR tracks should be placed to maximize off-load capabilities while minimizing risk. Plan air-refueling tracks outside of threat zones to the maximum extent possible. If there is doubt about a particular area close to the tanker orbit, Intelligence can use tools simulation (FPTAS) to determine the level of threat. Proximity of the tanker base to the refueling track can have a significant impact on tanker off-load capability and, therefore, the number of tankers required. For an example of how resources may be positioned within the Within JOA.

4.3.2.6.3 Combat Air Patrols. Requirements for HVAA assets and friendly force protective coverage are a factor in determining AAR track placement.

4.3.2.6.4 Airspace. Deconflict routing in and out of the AAR area via SPINS, ACO and local

procedures. The placement of AAR tracks in relation to the threat must allow tankers sufficient time and area to escape. Place Slide orbits in a location that allows for the safe continuation of air refueling.

4.3.2.7 Receiver Mission Considerations. Satisfying the receiver's fuel requirement is the tanker's primary objective, allowing the execution of the overall mission. A brief description of several receivers/ missions follows.

4.3.2.7.2 Strike. Strike receivers can be a wide type of aircrafts. Some items to consider when planning and executing the refueling mission are fuel offload, timing, location, airspeed, boom/drogue, and altitude.

4.3.2.7.2.1 Fuel Offload. Tanker planners need to work in concert with strike planners in the Master Air Attack Plan (MAAP) cell in the planning section in the CAOC. Planners should utilize AAR orbits closest to the marshalling points of the strike package. Crews can adjust their orbit sizes within the defined AR airspace to maximize receiver fuel load at the marshalling point.

4.3.2.7.2.2 Timing. Timing is critical to strike aircraft. Tanker crews should adapt to allow receivers to meet their timing with maximum off-load available.

4.3.2.7.2.3 Location. Planners should utilize AAR orbits closest to the marshalling points of the strike package to minimize transit time after AR.

4.3.2.7.2.4 Boom/Drogue. Strike packages will often include both boom and drogue receivers. Planners should allow approximately 15 minutes for a tanker to transit from a high altitude/high speed air refueling to a low altitude/slow speed refueling.

4.3.2.7.3 CSAR. CSAR missions are time critical in nature. Tankers may need to sit ground alert to support this mission. The CSAR package may require support aircraft for DCA and SEAD. This mission is characterized by potentially high offload requirements.

4.3.2.8 Tankers with BOOM and Probe & Drogue capability Considerations. Wing Pod Drogue is a valuable resource in limited supply.. When possible, like aircraft must be co-located (e.g. MPRS at one deployed location) to simplify the mission tasking process. When considering NATO tankers with BOOM and Probe & Drogue capability, there are benefits and drawbacks that need to be identified. Benefits will be take in consideration in those cases that air extension could be needed.

4.3.2.8.1) Benefits include:

- Same sortie boom and drogue refueling capability for a unique tanker
- Faster refueling cycle time for probe equipped receivers due to two drogues available
- Fewer tanker are aircraft required to support strike packages with both boom and drogue receivers (offload and cycle-time permitting)
- Reduced airspace saturation resulting from fewer tanker aircraft orbiting on-station

- Greater reliability tanker utilization with both refueling systems available on the same individual tanker

- One BOOM and Probe & Drogue capability tanker can fill ground alert for both Boom and Drogue, instead of two tankers with different systems.

4.3.2.8.2 Drawbacks include:

- Increased drag index reduces maximum take-off weight

- Increased fuel burn from the higher drag index and basic weight of MPRS/WARP aircraft may reduce fuel available at the start of the on-station time

- Reliability of both systems.

4.3.2.9 Mission Aborts. The ATO/SPINS should contain clear and concise Within JOA specific abort procedures. Abort procedures are an integral part of good mission planning.

4.3.3 Tanker Protection Considerations.

4.3.3.1 Man-Portable Air Defense System (MANPADS). MANPADS are a very significant threat to tankers in the terminal area. Additionally, MANPADS may be a threat when tankers are operating over areas of high surface elevation.

4.3.3.2 Surface-to-Air Threat. CAOC Tankers planners must coordinate with airspace planners to ensure that air-refueling airspace is not planned within adversary SAM WEZs.

4.3.3.3 Air-to-Air Threat. CAOC Tanker planners are responsible for clearly identifying the procedures for air-to-air threat response. This information should be clearly defined in the SPINs.

4.3.3.3.1 Retrograde Planning. Retrograde planning is intended to give the operational C2 and aircrew tools to reposition forces and keep them away from emerging threats.

4.3.3.3.1.1 Retrograde Options. The CAOC will designate retrograde options in the SPINS and outline a specific course of action.

4.3.3.3.1.1.1 Slide. A slide is a directive call to continue the present mission while flowing from station in response to a perceived threat. The C2 element will direct a slide when a threat approaches a predefined trip wire limit. Tankers who are directed to slide should continue normal AAR operations while turning away from the threat and either proceeding to the slide orbit or maintaining the assigned slide heading. The slide allows air refueling to continue, while buying time/distance.

4.3.3.3.1.1.2 Scram. A scram is a directive call to egress for defensive or survival reasons. It will be directed when the threat crosses the scram trip wire. Tankers who are directed to scram should immediately discontinue AAR, turn away from the threat, accelerate to maximum speed, and descend as required.

4.3.3.4 Tanker Specific Planning Factors. Adversary threat capabilities are considered for

all HVAA protection plans. Specific planning factors that should be considered when establishing air refueling track locations and retrograde procedures include:

- Air, ground and, naval forces (AWACS, GCI, Red Crown, etc.) that can provide information to support slide, scram, and reconstitution plans

- Fully coordinate, and deconflict the protection plan with HVAA protection assets

- Ensure execution, control, and authority for HVAA retrograde and reconstitution procedures are clearly defined in the SPINS.

4.4.4 Mission Planning Considerations.

4.4.4.1 Predeployment Responsibilities. Ensure that aircrews are given the information and support needed to successfully deploy and set up Within JOA support operations. Predeployment planning starts with the collection of all relevant information for the deployment and reception of aircrews into the Within JOA. For a sample list of important information see Table 6.2 (Predeployment Planning Considerations).

Table 4.2 Predeployment Planning Considerations
• Diplomatic clearance
• Establish contact with customs (if necessary) to smooth transition for arriving aircraft.
• Determine MPC operations area layout and the available facilities. Establish security measures and procedures for the working area.
• Set up MPC equipment, determine phone numbers, and establish comm links.
• Establish contact with AOC to determine ATO routing, timing, and points of contact.
• Get initial tasking orders and determine which SPINS and ROE apply.
• Determine aircraft parking plan, parking spot coordinates, and ground operations flow.
• Locate Within JOA airfields being used by coalition forces and determine their suitability as alternates.
• Assess fuels availability and buildup requirements. Start emergency requests if needed.
• Determine regeneration plan and what the configurations will be.
• Coordinate with squadron schedulers to determine sortie generation capability.
• Determine how the base supports hot pit, fuel truck, and cargo marshaling operations.
• Build a flush plan and coordinate it with the base defense plan.
• Determine taxi flows.
• Build local combat aid to include items required in regulations. Consider printing the airfield diagram, parking coordinates, frequencies, flush procedures/areas, base defense CAP points, and local pattern/recovery/safe passage.
• Fuel jettison area, controlled bailout area, and divert data.
• Build base defense brief for alert crews.
• Build a local area brief for aircrew arrival. Items to include are a situation/intelligence brief, local area air traffic control (ATC), departure and arrival procedures, minimum risk routing, divert options, alert status, and the SPINS/ROE highlights from the frag. Other briefing items include the flight surgeon's brief, flush procedures, and a base defense overview

4.4.4.2 Within JOA AAR Mission Planning. In order to develop required mission planning material, information should be extracted from within the ATO, ACO, and SPINS. The information listed in **Table** 6.3 (Required Mission Information) is important for the development of the products listed in Table 6.4 (Products Generated by the WOC). These products are examples of relevant information that aircrews will need to accomplish the mission. An ATO breakout tool "ATO Machine" has been developed to assist mission planning cells in distributing ATO and ACO information to the crews.

Table 4.3 Required Mission Information.

Airspace	Air refueling airspace Missile engagement zones (MEZ) transit routes Minimum risk routes (MRR) Restricted operating zones (ROZ) Airspace controlled by naval operations
Controlling Agencies	Call signs and frequencies (primary, secondary, and chattermark). Which agency controls what?
Threat Notification/Warning	Threat notification procedures (e.g., frequencies, bulls eye, and grid procedures) Assets providing threat warning (e.g., AWACS) at should retrograde procedures look like
	Identification, Friend or Foe (IFF) Safe passage procedures Codes and Procedures ORDO procedures
	Tip Wire information
Air Refueling Information	Receiver type, call signs, and tail numbers
	Frequencies (primary and secondary)
	Air refueling tracks
	Altitudes
	Fuel off-load/on-load
	RZ, ARCT, and AR exit times
	A tactical air navigation (TACAN) channels
	EMCON procedures

	Ingress/egress times and routes
	Unit point of contact for coordination
	Alternate mission options
	Who is above/below/beside you?
Communications Procedures	ORDO procedures Brevity code usage/procedures
	Authentication procedures

Table 4.4 Products Generated by the WOC.

General	
TO breakout sheet	airspace/SPINS summary
Code word/frequency card	OE criteria summary
IFF plan/sequencing for proper timing	picture map (with bullseye)
Unit specific schedule	briefings (if required)
Mission summary (kneeboard)	aircrew guides (see Table 6.5, Aircrew Mission Preparation Guide)
Aircraft Specific	

Mission narrative	Routes/flight plans
Route charts Threat information	Mission data card/sheet DTDs/PCMCIA
Weather sheet	airspace depictions
Support asset information	NOTAMS
UNCLASSIFIED	

Table 4.5 (U) Aircrew Mission Preparation Guide.

Weather briefing Weather for tactical departure Current conditions
Intelligence/OSI briefing (ground considerations) threat Charts
[SOPREP review
Threats (Air-Air, SAM, AAA, MANPADS, Laser, Small arms) Departure/approach threats
ATO/ACO/SPINS
Mission objectives
Number and type aircraft in package
Station times, alert status, receiver timing considerations
Alternate mission requirements
Communications and rendezvous plan
EMCON levels
Mission frequencies primary/secondary (check-in, AWACS, ABCCC, air defense, CSAR)
Chattermark priorities

HAVE QUICK, secure voice requirements
Bullseye reference locations and brevity code words Airspace control procedures IFF mode settings Guidance on authorized refueling procedures (i.e MBL / Pressure A/R) Guidance on clearance to refuel w/ coalition receivers Within JOA airspace control review

4.4.4.3 (U) Within JOA Operations Considerations. National planners need to give specific guidance about local aerodrome tactical considerations. The Nations should also disseminate CAOC developed guidance on specific tactical environment procedures concerning the items in Table 6.6 (Within JOA Operations Considerations). Aircrews should set emitters as directed by the SPINS. WOC planners should consider building a Within JOA-specific checklist (in-flight guide) for aircrews.

4.4.4.4 Departure and Arrival. CAOC Tanker planners needs to coordinate arrival and departure procedures with ATC, GCI, the Force Protection Working Group and Air Defense forces to develop procedures that are thoroughly defined, and understood by all.

4.4.4.5 Coordination. Nations and crews must keep CAOC-level planners abreast of all factors that could adversely affect mission capability.

Table 4.6. Within JOA Operations Considerations

Emitters

1. UHF/VHF radios
2. HF radios (automatic transmit features)
3. L-Band SATCOM
4. Rendezvous Beacon
5. TACAN
6. TCAS
7. IFF (Modes 1, 2, 3A, 3C, 4, 5)
8. Doppler
9. Search/weather radar
10. Radar/radio altimeters/GPWS
11. Interphone
12. Emergency locator transmitter
13. Interior lighting
14. Exterior lighting

Other Considerations

15. Ground procedures (crew transportation, taxi, and takeoff)
16. Survival equipment Cockpit voice recorder
17. Departure and arrival procedures
18. Pressurization

19. Retrograde (Slide or Scram) procedures
20. Combat descent procedures
21. Divert Options

4.4 Aircrew

4.4.1 Mission Planning Considerations.

4.4.1.1ATO Breakout. The ATO is the document that designates all of the missions in the AOR. The mission tasking includes all of the mission specifics. Essential items such as aircraft type, Mode 1, 2, and 3 codes, refueling altitudes, off/on-loads and call signs are shown in the tasking. The format may not be consistent between Within JOAs of operation,

4.4.1.2 Aircrew / Intel interface. Interface between intelligence and the operator is essential. Be prepared to ask questions for your route of flight and clarify the threats that may be encountered as part of your mission.

4.4.1.3 Intelligence Support. Intelligence personnel use an extensive permission briefing checklist to support combat mission planning. The checklist includes current political and military developments, mission overview, orders of battle (OB), potentialthreats (departure through recovery), reporting procedures, evasion and recovery (E&R), applicable SPINS information, and debriefing requirements.

4.4.1.4 Threat Considerations. Use the latest intelligence to determine capabilities, limitations, and locations of known threats.

4.4.1.5 Threat Notification.

4.4.1.5.1 General. Survival in a hostile environment depends upon early awareness and communication of threat information. The two most common methods of communication are broadcast and close control. Broadcast control is not specific to an aircraft/flight. Typically, information is provided with reference to a bullseye or geographic point (e.g. radial/DME from the reference point). Close control is provides information to a specific aircraft/flight.

4.4.1.5.2 Bullseye. The bullseye format is used to pass threat information to all HVAAs and is based on a designated location. The basic format is bearing and range. Bearing is given in digital or cardinal directions, and range is given in nautical miles. Additional threat information may include altitude, heading, numbers, and identification, if known. When there is more than one group of threat aircraft, the HVAA controller should precede the call with the number of groups.

4.4.1.5.2.1 Digital Bullseye. Digital bullseye gives bearing in degrees from magnetic north and is the preferred means of passing information while providing broadcast control (e.g., “SENTRY, TWO GROUPS, BULLSEYE 070/35, BULLSEYE 010/14”).

4.4.1.5.2.2 Cardinal Bulls eye. Cardinal bulls eye gives bearing as one of the eight cardinal directions from magnetic north (e.g., “SENTRY, CAP, NORTHEAST BULLSEYE, 27”).

4.4.1.6 Situational Awareness Resources. Even though the tanker does not have a

dedicated source for real-time tactical information, there are other resources within the system that can help tanker crews improve their situational awareness with regard to threat and position information. These resources are both internal and external, and they include:

4.4.1.6.1 Flight Management Systems (FMS). Aircrews should be familiar with the numerous flight management tools (ETCAS, EGPWS, WX radar, etc.) available within the FMS that graphically depict terrain, airborne targets, weather, and area orientation.

4.4.1.6.2 Falcon View. Aircrews should be aware of the capability to use Falcon View laptops onboard the aircraft to display known threat locations, area boundaries, and other tactical planning data.

4.4.1.6.8 Receivers. Receivers may provide information if they are equipped to do so. Do not rely on them for advance notification. Expect to receive warnings from C2.

4.4.1.7. Communications. Communications should be minimized, concise, clear and timely. However, great emphasis should be placed on not being so minimized and concise as to fail to clearly convey the intended message. Without precise and disciplined communications, the risk of conveying incorrect information is reduced.

4.4.2. Takeoff/Arrival Considerations

Aircrews must follow local guidance concerning departures and arrivals. Review Chapter 3, Mission Planning Considerations, for information on the Force Protection Working Group, and Chapter 8, Threat Considerations, for information on procedures.

4.4.3. Enroute.

4.4.3.1 Weather Considerations. Standard weather considerations should be taken into account; however, operating in a tactical environment (AOR) requires further discussion. Operations in the AOR are outlined in the SPINS and often designated VMC only. Aircrews should realize that the primary responsibility of AWACS and GCI is not ATC separation and that safe separation from friendly forces is not guaranteed, even in IMC conditions. In many cases ATC clearance will be cancelled after tactical entry and aircrews are responsible for traffic separation. Poor weather conditions can significantly complicate operations in this VFR environment, and crews must remain extremely vigilant.

4.4.3.2 Aircraft Lighting. Aircraft lighting configuration will be directed by Within JOA SPINS. It may have a significant impact on the receiver's ability to rendezvous with the tanker. Mission requirements and safety concerns must both be considered.

4.4.4. Ingress /Egress Operations.

The SPINS will define the point at which to proceed "tactical." Emitter options designated on these checklists will follow Within JOA guidance spelled out in the SPINS.

4.4.4.1 Tactical Operations. The tactical entry point is the point where aircrew's transition from civilian ATC authority to military command and control. AOR procedures determine EMCON, communications and procedural guidance.

4.4.4.2 Check In. The frequency for check in is designated by the controlling agency in the SPINS. An example of an initial check is: “Bluebird, Robin 63 checks point tango, as fragged, request picture North.” A typical response would be “Robin 63, Bluebird has you Sweet, picture north clear. You are cleared highway, fragged angels.” Most communications will use a combination of these brevity words and designated code words. Code words are defined in the SPINS and change on a daily basis.

4.4.5. Area Operations.

4.4.5.1 Air-to-Air Refueling Receiver Considerations. Detailed AAR procedures are dependent on receiver performance and the type of mission the receiver is conducting.

4.4.5.1.1 Rendezvous. Tanker crews are ultimately responsible for the rendezvous with the receiver and should not rely on outside agencies (e.g. AWACS/GCI).

4.4.5.1.2 Quick Flow. Quick flow procedures may be used during VMC conditions to minimize receiver formation time on the tankers boom.

4.4.5.2 Airspace Complications. Aircrews are ultimately responsible for utilizing “see and avoid” procedures because ATC may be extremely limited, easily saturated, or nonexistent. AWACS/GCI control may provide flight following but will not be able to guarantee traffic separation. Plan to fly the mission as tasked; however, exercise sound judgment due to airspace congestion.

4.4.5.3 Contrail Avoidance. Contrails highlight the presence and flight path of aircraft. This is normally of little concern for tanker aircrews operating in airspace that is secured or protected. However, if the crew is in a situation where they are operating over unsecured areas, (i.e. CSAR, wounded bird rescue, or forward air refueling), contrails simplify visual acquisition by the enemy. Unless other aircraft are present, the tanker crew will have difficulty determining whether their aircraft is contrailing. The only way to obtain contrail information may be from the weather brief prior to the flight. Changing altitudes may be the only way to eliminate contrails.

4.4.6. Mid-Mission Join-ups.

If directed to join aircraft into a formation and prior coordination is not available, the rejoining tanker will come in no less than 1,000 feet higher than the highest aircraft in the formation. ETCAS may be used to verify altitude separation. Lead maintains airspeed of 275 KIAS or as directed. Heavy weight aircraft may require 310 KIAS. Rendezvous procedures or airspeed differential may be used to get together with the formation. If ETCAS is used as a reference, crews need to be aware that the position of the aircraft on ETCAS may “skate” during rejoin closure and proximity to other aircraft becomes close. In other words, the exact position of the returns on the ETCAS may not correspond with the exact position of the aircraft. Communications between the tankers may be required to affect a safe rejoin. Comply with EMCON procedures directed in Within JOA SPINS.

4.4.6.1 Visual Flight Rules (VFR) Formation Rejoin. Visual cutoff may be used to expedite the rejoin in the AAR airspace. When the formation is in sight or confirmed on radar/ETCAS and the joining tanker is in a stabilized position, descend to 500 feet above the formation. If conditions permit, lead should consider establishing a 15-degree bank turn to allow for

visual cutoff.

4.4.6.2 Instrument Flight Rules (IFR) Formation Rejoin. If the aircraft's flight management system (FMS) contains an intercept function and the airspeed, heading, and latitude/longitude of the aircraft the tanker is rejoining on are known, the FMS will compute an intercept point and time, if heading and airspeed can be maintained. Radar as the primary formation station keeping method also may be used

4.4.7 Combat Search and Rescue (CSAR).

Tanker aircraft and aircrews will be an integral part of any CSAR operation in a combat environment. CSAR procedures must be included in the Within JOA SPINS and ACP. The tanker aircraft can provide a SAR communications and coordination link between airborne and ground-based elements. For more information on CSAR, refer to Chapter 3 of this manual, and AFDD 2-1.6, Combat Search and Rescue.

4.4.8 Intelligence Debrief.

Intel debrief should be attended by all aircrew members. This gives the tanker crew an opportunity to relay intelligence information to the rest of the Within JOA.

4.4.8.1 Significant Events Reporting. Your intelligence briefer will identify what information they want you to bring back for debrief. Examples of debrief items would include observed surface to air fire or spotlighting. For surface to air fire (SAFIRE) events, aircrew should note the color of the muzzle flash, the rate of fire, and the altitude and color of air bursts.

4.4.8.2 Spectrum Interference Resolution Report. Anytime spectrum interference is encountered, a report should be filed with intel during debrief. If possible, get a UHF/DF bearing and log the present position to assist in future targeting or avoidance of the jamming station.