

**COMPLIANCE WITH THIS INSTRUCTION IS MANDATORY.**

This instruction implements policy guidance in AFPD 11-2, Flight Rules and Procedures. This instruction prescribes standard operational and weapons employment procedures to be used by all pilots operating USAF A/OA-10 aircraft. Units may supplement this instruction using Chapter 8, MAJCOMs may supplement using Chapter 9. This instruction applies to Air National Guard (ANG) units when published in ANGIND2. It applies to United States Air Force Reserve (USAFR) units when published in AFRESIND2. Each pilot is authorized a copy of this instruction.

**NOTE:** This publication incorporates PACAF's Chapter 9 using the paragraph supplementation method. **Supplemental material is highlighted in BOLD type and prefaced with (PACAF).**

**SUMMARY OF REVISION**

This instruction aligns with AFPD 11-4 and incorporates the requirements, information, procedures, and guidance formerly in MCR 55-110. The \* symbol indicates a change (other than grammatical) from the previous edition of this publication.

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Chapter 9—MAJOR COMMAND OPERATING PROCEDURES

Attachments

1. General Briefing Guide
  - A. Special Subjects Briefing Guide
2. Instrument/Navigation Briefing Guide
3. Air Refueling Briefing Guide
4. (Dissimilar) Air Combat Training Briefing Guide
5. Escort Mission Briefing Guide
6. Low Level Navigation/Low Altitude Tactical Navigation (LATN) Briefing Guide
7. Air-to-Surface Weapons Employment Briefing Guides
  - A. Range Mission
  - B. Surface Attack Tactics
  - C. Close Air Support/Interdiction/Armed Recce/FAC/JAAT
  - D. Combat SAR Briefing Guide
  - E. Air Strike Control Briefing Guide
- \*8. Night Vision Goggles (NVG) Considerations
9. Mission Debriefing Guide
- \*10. NVG Cockpit Set-up
- \*11. (PACAF) NVG Cockpit Set-Up Checklist and Degraded Cockpit Training Limitations**

## Chapter 1 INTRODUCTION

### 1.1. General.

**1.1.1. Scope.** This regulation outlines those procedures applicable to the safe operation of the A/OA-10 aircraft. With the complementary references cited, this regulation prescribes standard operational procedures for all USAF A/OA-10 pilots.

**1.1.2. Pilot's Responsibility.** This regulation, in conjunction with other governing directives, prescribes procedures for A/OA-10 aircraft under most circumstances, but is not to be used as a substitute for sound judgment or common sense. Operations or procedures not specifically addressed may be accomplished if they enhance safe, effective mission accomplishment.

**1.1.3. Deviations.** Deviations from these procedures require specific approval of the MAJCOM (ANG/AFRES) unless an urgent requirement or an aircraft emergency dictates otherwise. In this case, the pilot in command will take the appropriate action to safely recover the aircraft.

**1.1.4. References.** This regulation, in conjunction with T.O. 1A-10A-1, T.O. 1A-10A-34-1-1, MCM 3-1, MCH 11-A/OA10 Vol 5 (MCM 3-3) and AFI 11-214 are the primary references for A/OA-10 operating procedures. Training units may develop phase manuals from the procedures contained in these documents. Phase manuals may expand these basic procedures; however, in no case will they be less restrictive, nor will they change the procedures in these documents.

**1.2. Waivers.** Forward waiver requests through appropriate channels to the applicable MAJCOM for approval. Approved waivers are granted for a period of 1 calendar year.

**1.3. Changes.** Submit recommendations for change to this regulation on AF Form 847, Recommendation for Change of Publication (Flight Publications), through proper channels to the parent MAJCOM. Forward approved recommendations to the MCOPR.

**1.4. Distribution.** Each pilot is authorized a copy of this regulation.

## Chapter 2 MISSION PLANNING

**2.1. Responsibilities.** Individual pilots and the operations and intelligence functions of tactical flying organizations jointly share the responsibility for mission planning.

**2.2. General Procedures.** Accomplish sufficient flight planning to ensure safe mission accomplishment to include fuel requirements, map preparation, and takeoff and landing data.

**2.2.1. (PACAF) Planned flights over water, outside of the local training area (e.g., deployments, cross countries, PDM inputs, etc.) will be accomplished two-ship as a minimum. Single ship over water flights, outside of the local training area, require Operations Group Commander approval.**

### 2.3. Map/Chart Preparation.

**2.3.1. Local Area Maps.** A local area map is not required if pilot aids include jettison areas, divert information, controlled bail-out areas, and provide sufficient detail of the local area to remain within assigned training areas.

**2.3.2. Charts.** FLIP enroute charts may be used instead of maps on navigational flights within areas adequately covered by these charts.

**2.3.3. Low Altitude Maps.** On low altitude flights, each pilot in the flight will carry a current map of the low altitude route/operating area. The map will be of such scale and quality that terrain features, hazards, and chart annotations are of sufficient detail to allow individual navigation and safe mission accomplishment. Prepare maps for low-level navigation IAW MCR 55-125 and/or as directed locally. Annotate a route abort altitude (RAA) on all maps (see paragraph 3.19.14). Update maps from the Chart Update Manual (CHUM) and highlight all man-made obstacles above the planned flight altitude. For VR routes, time and/or distance tick marks will be annotated on the maps to ensure positive positional awareness for obstacles along the planned route of flight.

### 2.4. Briefing/Debriefing.

**2.4.1.** Flight leaders are responsible for presenting a logical briefing that promotes safe, effective mission accomplishment. Use briefing guides to provide the flight leader/briefer with a reference list of items that may apply to particular missions. Items listed may be briefed in any sequence. Those items understood by all participants may be briefed as "standard." Specific items not pertinent to the mission need not be covered. When flying with dissimilar aircraft in formation, brief proper position (to ensure adequate wingtip clearance) responsibilities, and aircraft-unique requirements for each phase of flight.

- Briefings will normally begin at least 1 and 1/2 hours before scheduled takeoff.
- Structure the flight briefing to accommodate the experience and capabilities of each pilot in the flight.
- Each flight will brief an alternate mission. The alternate mission will be less complex than the primary and should parallel the primary mission. If not parallel, brief the specific mission elements that are different. Unbriefed missions/events will not be flown. Mission elements/events may be briefed while airborne if practical and flight safety is not compromised. Flight leads ensure changes are acknowledged by all flight members.
- Debrief all missions.

**2.4.2. Deployed Operations, Exercise, and Quick Turn briefings.** If all flight members attend an initial or mass flight briefing, the flight lead on subsequent flights need brief only those items that have changed from the previous flight(s).

**2.4.2.1. (PACAF) On multiple-go days when aircraft turn times do not allow for follow-on mission brief(s) and only an initial flight briefing is accomplished for all goes, the following guidance will apply:**

- Upgrade missions will be planned for the first sortie flown. Subsequent missions flown should be of equal or less complexity with no upgrade training planned without OG/CC approval.
- Aircrews participating in continuation training may fly their primary or alternate missions in any sequence. The alternate mission will be less complex than the primary mission.

**2.4.3.** Refer to Attachment 1 for mission briefing guides. Units may augment these guides as necessary. Pending

development by a higher headquarters, units that fly missions not covered by this regulation or its supplements (for example, OT&E weapons delivery profiles) will develop and maintain briefing guides for those missions, and submit the guides to MAJCOM/DO for review.

## **2.5. Unit-Developed Checklist/Local Pilot Aids.**

**2.5.1.** Unit developed, expanded checklists may be used instead of flight manual checklists provided they contain, as a minimum, all items, verbatim and in order, listed in the applicable checklist.

**2.5.2.** Locally produced pilot aids will be developed. As a minimum, include the following:

- Briefing Guides.
- Local UHF/VHF/FM channelization, and airfield diagrams.
- Impoundment procedures, emergency action checklists, and NORDO/divert information.
- Cross-country procedures to include: command and control, engine documentation, JOAP samples, servicing, manual reversion ground checks, and other information as deemed necessary by individual units. For example: stereo flight plans, turnaround procedures, local training areas and bailout/jettison areas.

**\*2.6.** Minimum TOLD requirements on Mission Data Cards are: acceleration check speed, refusal/maximum abort speed(dry/wet), takeoff speed and distance, and normal/heavyweight landing distance (dry/wet).

## Chapter 3 NORMAL OPERATING PROCEDURES

**3.1. Ground Visual Signals.** Normally, pilot and ground crew will communicate by the intercom system during all start-engine, pre-taxi and EOR checks. Use the intercom system to the maximum extent possible anytime maintenance technicians are performing "redballs" on the aircraft. The pilot will not activate any system that could pose any danger to the ground crew prior to receiving proper acknowledgment from ground personnel. When not using ground intercom, visual signals will be in accordance with AFI 11-218 and this regulation. The crew chief will repeat the given signal when it is safe to operate the system. The following signals augment AFI 11-218:

**3.1.1. Auxiliary Power Unit (APU) Start.** Pilot rotates three fingers above head in a circular motion.

**3.1.2. Engine Start.** Pilot rotates hand above head in a circular motion with one finger extended to signal for a left engine start or two fingers extended to signal for a right engine start.

**3.1.3. Flight Control Check.** Raise arm, clench fist, and make a stirring motion.

**3.1.4. Trim Check.** Pilot forms a "T" with hands: then raises one finger for elevator trim, two for an aileron trim, and three for rudder trim while each system is being checked for proper movement.

**3.1.5. Brake Check.** Hold left or right arm horizontal, open hand and push forward, breaking at the wrist (as in applying rudder pedal pressure with feet).

**3.1.6. Slat Check.** Pilot points to transducer vane.

**3.1.7. Gun/Armament Check.** Point index finger forward with thumb upward simulating a pistol and shake head (Yes or No).

### 3.2. Starting Engines and Before Taxiing.

**3.2.1.** Pilots will be cleared by the crew chief prior to starting the APU, engines or actuating flight controls.

**3.2.2.** All flights require the bleed air function of the APU.

**3.2.3.** Aircraft stall warning devices will be fully operational for all flights.

### 3.3. Taxi.

**3.3.1.** Minimum taxi interval is 150 feet. Spacing may be reduced when holding short of or entering the runway.

**3.3.1.1. (PACAF) Minimum taxi interval is 300 feet when operating on an RCR of less than 12.**

**3.3.2. Quick Check and Arming.** Place hands in view of ground personnel while the quick check inspection, arming/de-arming, and/or hot refueling are in progress.

**3.3.3.** Do not taxi in front of aircraft being armed/de-armed with forward firing ordnance.

**3.4. Flight Lineup.** Flights will line up appropriately based on weather conditions, runway conditions and runway width. Spacing between separated elements/flights will be a minimum of 500 feet. If performing formation takeoffs, wingmen must maintain wingtip clearance with their element leader. If runway width precludes line up with wingtip clearance between all aircraft in the flight, use 500 feet spacing between elements or delay run-up until the preceding aircraft has released brakes.

**3.5. Lineup Checks.** After completing the "Lineup Checks" and prior to takeoff, all flight members will inspect each other for proper configuration and any abnormalities. Wingmen will indicate they are ready for takeoff by a head nod, radio call, or landing/taxi light signal as briefed.

### 3.6. Takeoff.

3.6.1. Do not attempt a takeoff if the RCR is less than 12 or as specified otherwise by MAJCOM.

- **(PACAF) The 354 Operations Group Commander may waive this restriction but in no case will takeoffs be performed with RCRs less than 8.**
- **(PACAF) When the RCR is less than 12, a run-up check will not be performed prior to brake release, the takeoff roll will not be started until the preceding aircraft is airborne, and if the crosswind component exceeds the RCR, takeoffs are prohibited.**

3.6.2. On training missions, do not takeoff if the computed takeoff roll exceeds 80 percent of the available runway single ship, or 70 percent for a formation takeoff.

3.6.3. Do not attempt takeoffs unless a minimum single-engine climb rate of 150 feet/minute can be achieved (gear up, failed engine windmilling and all jettisonable stores-jettisoned) for local and deployed operations. When unique obstacle clearance conditions are present, consider establishing a higher minimum single-engine climb rate. In order to achieve the desired climb rate, the following actions may be necessary: reduce fuel and ordnance loads, cart all stores (except ECM pods), etc. If operational requirements dictate, takeoffs may be made without a positive single-engine climb rate when approved by the Wing/Group Commander.

3.6.4. If operational requirements dictate, intersection takeoffs may be approved by the Wing/Group Commander.

3.6.5. Takeoff interval between aircraft/elements will be a minimum of ten seconds except for chased takeoffs. When accomplishing a joinup on top or when carrying live ordnance, (excluding 30mm, rockets, flares or air-to-air missiles) increase takeoff interval to a minimum of 20 seconds.

### 3.7. Formation Takeoff.

3.7.1. Formation takeoffs are restricted to elements of two aircraft.

3.7.2. A qualified flight leader will lead all elements unless an IP, or flight lead qualified squadron supervisor, is in the element.

3.7.3. Formation takeoffs will not be made when:

- Runway width is less than 140 feet.
- Standing water, ice, slush or snow is on the runway.
- The crosswind or gust component exceeds 15 knots.
- Computed takeoff roll in excess of 70 percent of available runway length.
- Loaded with live munitions (excluding 30mm, rockets, flares or air-to-air missiles).
- Ferrying aircraft from contractor/ALC facilities.
- **(PACAF) RCR is less than 12.**

3.7.4. Configure aircraft so as not to exceed an asymmetrical load moment of 12,000 foot-pounds. When asymmetrical loading is expected to create a noticeable rolling moment, the runway line-up will be such that both aircraft will not roll toward each other on liftoff. Differences in aircraft gross weight will not exceed 2,000 pounds and takeoff data will be computed for the heavier aircraft. Asymmetrical configurations, to include one of the following, should not prohibit takeoff with an aircraft not similarly configured:

- A rack plus practice bombs,
- A rocket/flare dispenser,
- A TGM-65,
- An air-to-air missile, or an ECM pod (except ALQ-184).

3.7.5. **Formation Takeoff Procedures.** Refer to MCH 11-A/OA10 Vol 5 (MCM 3-3).

- On the flight leader's signal, set the core RPM at 90 percent or as briefed by the flight leader and check the engine instruments.
- Smoothly add power after brake release. If lead needs to reduce power for the wingman on takeoff, he will not reduce



throttles beyond 3 percent below predicted takeoff fan speed.

- Maintain wingtip clearance throughout takeoff roll. If the wingman overruns the leader, the leader will direct the wingman to assume the lead, at which time the wingman will push up to MAX power, maintain his side of the runway, and make his own takeoff. The original leader will then be responsible for inflight separation and directing appropriate measures to regain flight integrity or initiate lost wingman procedures. The original wingman will fly the briefed departure until instructed otherwise by the flight leader.
- Retract the gear after the flight leader observes the wingman to be safely airborne.

### 3.8. Joinup/Rejoin.

**3.8.1.** Day weather criteria for a joinup underneath a ceiling is 1,500 feet and 3 miles.

- Flight leaders will maintain 200 KIAS until joinup is accomplished unless briefed otherwise.
- If accomplishing a turning joinup, the flight leader will normally not exceed 30 degrees of bank.
- Flight members will join in sequence. For a straight ahead rejoin, the number two aircraft will join on the left wing and the element will join on the right wing unless otherwise briefed. For a turning rejoin, the number two aircraft will rejoin on the inside of the turn and the element to the outside. If mission or flight requirements dictate, the flight leader will specifically call and state the desired formation positions.
- For further joinup procedures, see Para 3.10 and Chapter 4.

### 3.9. Formation, General.

**\*3.9.1.** The flight lead will supervise formations. The flight lead retains responsibility for the flight regardless of which physical position he flies. Refer to MCI 11-A/OA10 Vol 1, Chapter 1 for specific instances when wingmen may lead formations. Wingmen should have the situational awareness to be prepared to fly the number one position if, in the judgment of the flight lead, such action is warranted. The term element lead may be used to designate the number three aircraft in a flight of four. This, in itself, does not imply flight lead authority.

**3.9.2.** Do not perform rolling maneuvers during joinup/rejoins to non-tactical formation.

**3.9.3.** Do not perform rolling maneuvers to maintain or regain position below 5,000 feet AGL or in airspace where aerobatics are prohibited.

**3.9.4.** Airborne visual signals will be in accordance with AFI 11-205. For four ship flights, initiate configuration changes by radio call, when practical. When formation position changes are directed by radio, all wingmen will acknowledge prior to initiating the change. A radio call is mandatory when directing position changes at night or under instrument conditions.

**3.9.5.** Flight leaders will not break up formations until each pilot has a positive fix from which to navigate (visual, ATC, INS, or TACAN).

**\*3.9.6.** In IMC, maximum flight size in close formation is four aircraft except when flying in formation with a tanker (refer to T.O. 1-1C-1-26).

**3.9.7. Changing Leads.** Refer to MCH 11-A/OA10 Vol 5 (MCM 3-3).

- The minimum altitude for changing leads within a formation/element in day VMC is 500 feet AGL over land or 1,000 feet AGL over water, except for emergencies (for night see paragraph 3.19.4; for IMC, see paragraph 4.6).
- Do not initiate lead changes with the wingman further aft of normal fingertip, route, or greater than 30 degrees back from line abreast.
- Prior to initiating the lead change, the leader will ensure that the wingman assuming the lead is in a position to safely initiate the lead change and maintain visual contact.

### 3.10. Tactical Formations.

**3.10.1.** Refer to MCM 3-1, MCH 11-A/OA10 Vol 5 (MCM 3-3) and MAJCOM directives. The following rules apply for flight path deconfliction during tactical maneuvering:

- Flight/element leads will consider wingman/element position and ability to safely perform a maneuver before directing it.

- Wingmen/elements maneuver relative to the flight lead/lead element and maintain sight. Trailing aircraft/elements will be responsible for deconflicting with lead aircraft/elements.
- \*For rejoins from tactical formation, the wingman will join to the side of the formation occupied at the time the rejoin is directed. If in trail, join to the left side. In all cases, the trailing element will join to the side opposite the number two, unless otherwise directed.
- \*Wingmen/elements go high and/or outside of the lead/lead element for deconfliction when required.

**3.10.2. Loss of Visual.** The following procedures apply when one or more flight members/elements lose visual contact within the formation.

- If any flight member/element calls "blind," then the other flight member/element will immediately confirm a "visual" with an informative/directive radio call.
- \*If the other flight member/element is also blind, then the flight leader will take action to ensure altitude separation between flight members/elements by referencing the altimeter. Use a minimum of 500 feet altitude separation when directed to deconflict. Avoid, if possible, climbs/descents through the deconfliction altitude. LASTE HUD altimeter readings should not be used as the primary altitude reference for deconfliction due to the likelihood of significantly different altimeter readings if not operating the HUD in NAV mode.
- If there is no timely acknowledgment of the original "blind" call, then the flight member/element initiating the call will maneuver away from the last known position of the other flight member/element and alter altitude.
- If visual contact is still not regained, the flight leader will take additional positive action to ensure flight path deconfliction within the flight and the scenario to include a "Terminate/Knock-It-Off," as appropriate. Consider scenario restrictions such as sanctuary altitudes and/or adversary blocks.
- Aircraft will maintain altitude separation until regaining visual and, if necessary, will navigate with altitude separation until regaining mutual support.

**3.10.3. Two-Ship.** Normally, the wingman is responsible for flight path deconfliction. The flight lead has primary responsibility for deconfliction when:

- Tactical maneuvering places the leader in the wingman's "blind cone" or forces the wingman's primary attention away from the leader (e.g., wingman becomes engaged fighter).
- The wingman calls "padlocked."
- The wingman calls "blind."
- Primary deconfliction responsibility transfers back to the wingman once the wingman acknowledges a visual on his lead.

**3.10.4. Three/Four-Ship (or greater).** When flights of more than two aircraft are in tactical formation:

- Formation visual signals performed by a flight/element leader pertain only to the associated element unless specified otherwise by the flight leader.
- Trailing aircraft/element(s) will maintain a sufficient distance back so that primary emphasis during formation maneuvering/turns is on low altitude awareness and deconfliction within elements, not on deconfliction between elements.

**3.11. Chase Formation.** Refer to MCH 11-A/OA10 Vol 5 (MCM 3-3).

**3.11.1. Restrictions.**

- \*Any pilot may fly safety chase for aircraft under emergency or impending emergency conditions. Qualified pilots (including IQT/MQT pilots who have successfully completed an Instrument/Qualification evaluation) may chase as safety observer for aircraft performing simulated instrument flight, hung ordnance recovery, or simulated single engine patterns. All other chase events will be flown only by IP/SEFEs, upgrading IPs supervised by an IP, or flight lead qualified squadron supervisors.
- \*During takeoff, the chase aircraft will maintain a minimum of nose-to-tail and wing tip clearance. All formation takeoff restriction apply except chased takeoffs may be accomplished if computed takeoff roll is in excess of 70 percent of available runway length and/or the crosswind or gust component exceeds 15 knots. Brief specific abort procedures.
- In flight, the chase aircraft will maneuver as necessary, but must maintain nose-tail separation. The chase will not stack below the lead aircraft below 1,000 feet AGL.
- In the traffic pattern, the chase aircraft may maneuver as necessary to observe performance.
- Confidence Maneuver Chase: The chase pilot will fly a pattern well clear of the maneuvering aircraft's flight path. The chase aircraft will not perform the confidence maneuver simultaneously.

- If anticipating or encountering weather conditions which may preclude an IP/SEFE from fulfilling their responsibilities, select an alternate course of action based on the qualifications of the pilot receiving the instruction/evaluation.
- When chasing live ordnance missions, the chase pilot is responsible for ensuring safe escape criteria is met.
- A safety observer in a chase aircraft will maneuver in an approximate 30 to 60 degree cone with nose/tail clearance to 1,000 feet, to provide assistance and effective clearing. The chase aircraft will not stack below the lead aircraft below 1,000 feet AGL.

**3.12. Show Formation.** Refer to AFI 11-209 and applicable MAJCOM directives for guidance. Specifically brief these formations and fly them IAW applicable directives and MCH 11-A/OA10 Vol 5 (MCM 3-3). Wing/Group Commander approval is required.

### **3.13. Maneuvering Parameters.**

**3.13.1.** Use TO 1A-10-1, MAJCOM operating procedures, MCM 3-1, and MCH 11-A/OA10 Vol 5 (MCM 3-3) to define and describe the performance of weapons deliveries, confidence maneuvers, aerobatics, ACBT, or advanced handling maneuvers.

**3.13.2.** G-Awareness maneuvering will be IAW MCH 11-A/OA10 Vol 5 (MCM 3-3), and MAJCOM guidance.

- \*A G-awareness maneuver will be accomplished prior to any tactical maneuvering, including range missions. Accomplish this maneuver in day VMC only.
- \* (PACAF) **This maneuver will not be accomplished in IMC, and will not be accomplished at night unless wearing NVGs.**
- \* (PACAF) **G-awareness exercises will be filmed in HUD and in Hot Mic. In addition, the tactical portion of all basic missions (BFM, SA, ACM, etc.) will be flown in Hot Mic to enable assessment of the anti-G straining maneuver. For high task sorties (DACT, Composite Force, Opposed SAT, etc.), it is highly desired for aircrews to fly in Hot Mic.**

### **3.13.3. Minimum Altitudes.**

- \*Confidence Maneuvers: Entry will be made at a minimum of 10,000 feet AGL.
- Do not perform aerobatics below 5,000 feet AGL.

**3.13.4.** Avoid flight through wing tip vortices/jetwash. If unavoidable, unload the aircraft immediately to approximately 1 G.

**3.13.5.** Do not use flaps as an inflight maneuvering aid in the conduct of aerial combat maneuvers. The MVR position may be used in the landing pattern, when loitering, when escorting another aircraft, etc.

### **3.14. Ops Checks.**

**3.14.1.** Accomplish sufficient ops checks to ensure safe mission accomplishment. Increase the frequency during tactical maneuvering at high power settings. Ops checks are required:

- During climb or at level-off after takeoff.
- When internal wing tanks or external fuel tanks (if carried) are empty. When internal wing tanks are dry, ops checks will include "wings dry." When carrying external tanks, ops checks will include "tanks feeding" or "tanks dry" as appropriate. Once the external tank(s) and/or internal wing tanks are confirmed and called dry, omit this call from subsequent ops checks.
- After completing air refueling.
- Prior to each (D)ACBT engagement.
- Prior to entering an air-to-surface range, once while on the range if making multiple passes, and after departing the range.

**3.14.2.** Minimum items to check are engine instruments, total fuel, internal/external fuel quantities/balance, G-suit connection, oxygen system, and cabin altitude.

**3.14.3.** Carefully monitor fuel system operation throughout the flight. Monitor fuel in each internal and external tank to

verify that fuel is transferring properly and that fuel distribution is correct.

**3.14.4.** For formation flights, the flight leader will initiate ops checks by radio call or visual signal.

- Wingmen will respond by radio call or visual signal and include total fuel reading and malfunctions, if any.

**3.15. Radio Procedures.** Use the complete flight call sign anytime any flight member initiates a radio transmission. In all other cases, an acknowledgment by flight position is sufficient. A "Terminate" or "Knock-It-Off" radio call should be made to terminate maneuvering for any reason, and may be made by any flight member, particularly when a dangerous situation is developing. This transmission applies to all phases of flight and all missions. All participants will acknowledge by repeating the call.

**3.15.1.** Brief the use of backup/alternate radios within a flight and monitor closely. Use of these radios as an "intraflight intercom" or for administrative information that should be held for debriefing is inappropriate and constitutes poor radio discipline.

**3.15.2.** The flight/mission leader will initiate all radio checks and channel changes and each flight member will acknowledge, in turn, prior to any flight member switching channels. Exception: During prebriefed radio silent training or limited comm operations, channel changes will be as briefed.

**3.15.3.** Individual flight members, in turn, will acknowledge radio checks that do not require the transmission of specific data. Acknowledgment by the individual flight member indicates the initiation or completion of the appropriate check.

**3.15.4.** If a flight member fails to check in after a reasonable length of time, the flight leader will attempt contact on another radio (UHF, FM, or VHF). If unsuccessful, the flight leader may direct a member of the flight, or the entire flight, back to the previous or pre-briefed frequency to regain radio contact. He may also use or direct the use of visual signals to get the missing member on proper frequency.

**3.15.5.** In addition to the standard radio procedures outlined in AFI 11-206, Specific Mission Guides, and FLIP publications, the following radio transmissions are required:

- All flight members will acknowledge understanding the initial ATC clearance. Acknowledge subsequent ATC instructions when directed by the flight lead or anytime during trail departures.
- Gear Check. Each pilot will make an individual gear check on base leg or if making a VFR straight-in approach, not later than 3 miles on final. When conducting instrument approaches, make gear checks in response to ATC instructions or no later than the final approach fix or glide path interception point. The wingman or chase need not make this call during a formation or chased approach.

**3.15.6.** When requiring simultaneous action by other flight members, the voice command will be followed by the word of execution "NOW."

**3.15.7.** Brevity code and other terminology will be IAW AFI 11-214 and MCM 3-1.

**3.16. Airborne Communications Jamming Procedures.** Refer to AFI 11-214.

**3.17. General Low Altitude Procedures.**

**3.17.1.** Fly low-level formation positions/tactics using MCM 3-1 and MCH 11-A/OA10 Vol 5 (MCM 3-3) as guides.

**3.17.2.** Fly line abreast formation at or above 300 feet AGL. When flying in formation below 300 feet AGL the wingman will be directed to a wedge, trail, or combat trail formation position. Training in the 300 to 100 feet AGL altitude block will be in short segments consistent with real-world risks and realistic tactical considerations.

**3.17.3.** During briefings, emphasis will be on low altitude flight maneuvering, effects of task saturation, time to ground impact, and observation of terrain features/obstacles along the route of flight. For low altitude training over water or featureless terrain, include specific considerations for operations with emphasis on minimum altitudes and spatial disorientation.

**3.17.4.** At altitudes below 1,000 feet AGL, wingmen will not fly at a lower AGL altitude than lead.

**3.17.5.** Flights operating in the low altitude environment will climb to a prebriefed safe altitude (minimum 1,000 feet AGL) when a Knock-It-Off is called.

**3.17.6.** Navigate using a combination of pilotage, dead reckoning (DR) and INS information. DR will be the primary means of navigation.

**3.17.7.** If unable to visually acquire or ensure lateral separation from known vertical obstructions, which are a factor to the planned route or flight, flight leads will direct a climb to ensure vertical separation 2NM prior to the obstacle.

**3.17.8.** When crossing high or hilly terrain, do not exceed approximately 120 degrees of bank. Limit zero or negative G crossings to upright bunting maneuvers that are within the zero/negative G limitations for the aircraft and external stores.

**3.17.9.** Minimum flight planning airspeed for low altitude flight/navigation is 240 KIAS. Minimum airspeed during low altitude flight/navigation is 200 KIAS.

**3.17.10.** For aircraft equipped with an operable radar altimeter, the system will be on and set at either the briefed minimum altitude or the command-directed low level altitude, whichever is higher. This restriction also applies to simulated and actual weapons delivery events.

**3.17.11. Minimum Altitudes.** The unit commander, IAW MCI 11-A/OA10 Vol 1 as supplemented, will determine and certify a pilot's minimum altitude. Pilots participating in approved step-down training programs will comply with the requirements and restrictions of that program. Unless higher altitudes are specified by national rules, route restrictions, or training syllabus, the following minimum altitudes apply to low level training:

**3.17.11.1.** 500 FEET AGL FOR:

- FTU students and instructors when conducting training IAW an applicable syllabus.
- Pilots who have not entered step-down training or are not certified for flight at lower altitudes.
- Overwater flight if duration is more than 1 minute or if out of sight of land, or if there is an indefinite horizon.

**3.17.11.2.** 100 FEET AGL FOR:

- Designated pilots during day operations.

**3.17.12. Minimum Safe Altitude (MSA).** MSA will provide a clearance of 1,000 feet above the highest obstacle/terrain feature (rounded to the next highest 100 feet) within 5 NM of the planned course, route boundaries, or operating area (e.g., MOA, low fly area, restricted area, etc.). Aircrews may compute an MSA for each leg/segment of the intended route of flight.

- For night (non-NVG) or IMC operations, the minimum altitude is MSA.

**\*3.17.13. (PACAF) When external tanks are installed, do not fly missions requiring tactical maneuvering at low altitudes.**

**3.17.14.** During all low altitude operations, the immediate reaction to task saturation, diverted attention, or an emergency, is to climb.

**3.17.15.** Weather minimums for visual low-level training will be 1,500 feet and 3 miles for any route or area, or as specified in FLIP for Military Training Routes (i.e., 3,000/5 for VR routes), whichever is higher.

**3.17.16. Low-Level Route/Area Abort Procedures.** Compute and brief a low-level route abort altitude (RAA). The RAA will provide a clearance of 1,000 feet above the highest obstacle/terrain feature (rounded to the next highest 100 feet) within 5 NM of the entire planned course, route boundaries, or operating area (e.g., MOA, low fly area, restricted area, etc.). Minimum airspeed for the route abort is 160 KIAS. Maximum pitch angle is 30 degrees nose high.

**3.17.16.1. VMC Route/Area Abort Procedures.**

- Maintain safe separation from the terrain.

- Comply with VFR altitude restrictions and squawk appropriate (IFF/SIF) modes and codes.
- Maintain VMC at all times. If unable, follow IMC procedures outlined below.
- Attempt contact with controlling agency, if required.

#### **3.17.16.2. IMC Route/Area Abort Procedures.**

- \*Immediately climb to, or above the briefed RAA. Transition to instruments if entering IMC.
- \*Maintain preplanned ground track. Execute appropriate lost wingman procedures if necessary. The flight/element leader is responsible for ensuring heading and/or altitude deconfliction during an IMC route abort procedure. Ensure altitude deconfliction is based on the prebriefed altimeter setting.
- If required to deviate from normal route/area procedures, or if the RAA is higher than the vertical limits of the route/area, squawk (IFF/SIF) emergency.
- Attempt contact with the appropriate ATC agency for an IFR clearance. If required to fly in IMC without an IFR clearance, cruise at appropriate VFR altitudes until receiving an IFR clearance.

#### **3.18. Air Refueling.**

**3.18.1.** Pilots undergoing initial/recurrency training in air refueling will not refuel with a student boom operator (does not apply to KC-10).

**3.18.2.** Pilots will not attempt a night hook-up if slipway lights are inoperative unless refueling is necessary to safely complete the mission.

**3.18.3.** During IMC or night tanker rendezvous, receivers will maintain 1,000 feet altitude separation and will limit range closure to no less than one mile, prior to visual contact with the tanker(s).

**\*3.18.4. (PACAF) Pilots should attempt to confirm post-refueling clearance with ATC prior to departing the air refueling altitude block. If outside radio contact, confirm clearance with ATC as soon as possible.**

**\*3.18.5. (PACAF) For training missions, pilots will discontinue EMCON 2, 3, 4 procedures during the post air refueling/cell breakup period to verbally confirm safe aircraft separation.**

**\*3.18.6. (PACAF) Quick Flow air refueling (follow-on receivers positioned closer than the observation position) is not authorized.**

#### **3.19. Night Operational Procedures.**

**3.19.1. Night Ground Operations.** Taxi spacing will be a minimum of 300 feet and the aircraft will taxi on the taxiway centerline. Normally, use the taxi light during all night taxiing. (Exception: When the light might interfere with the vision of the pilot of an aircraft landing or taking off, the taxiing aircraft will come to a stop if the area cannot be visually cleared without the taxi light.)

**\*3.19.2. Night Takeoff.** For formation takeoffs, flight/element leaders will turn the anti-collision strobes OFF and position lights BRIGHT (DIM as desired) STEADY when reaching the run-up position on the runway. At the flight leader's direction wingmen may leave anti-collision strobes OFF until brakes release subsequently turning the anti-collision strobes ON and position lights BRIGHT—STEADY for takeoff. The flight/element lead may direct wingmen to turn or leave the strobes OFF anytime the lights cause distraction. All aircraft will turn formation lights ON. During a night formation takeoff, call brake release and configuration changes over the radio. Following takeoff, each aircraft/element will climb on runway heading to 1,000 feet AGL and accelerate to 200 KIAS before initiating turns, except where departure instructions/local procedures/obstructions specifically preclude compliance.

**3.19.3. Night Joinup.** Weather criteria for night joinup underneath a ceiling is 1,500 feet and 3 miles. Accomplish joinup/rejoin at or above 1,000 feet AGL. During the rejoin, wingmen will cross check their altimeter to ensure they remain at least 1,000 feet AGL. After join up, the anti-collision strobes will be OFF and position lights will be BRIGHT (DIM if necessary) STEADY for all except the last aircraft. The last aircraft will keep the anti-collision strobe ON and position lights BRIGHT STEADY unless otherwise directed by the flight lead.

**3.19.4. Night Formation Procedures.** Refer to MCH 11-A/OA10 Vol 5 (MCM 3-3).

- \* (Non-NVG equipped) When in positions other than fingertip or route, maintain aircraft spacing primarily by instruments (radial/DME or Air to Air TACAN) and/or timing, with visual reference secondary. If unable to ensure aircraft spacing, then establish altitude separation (minimum of 1,000 feet). At all times, pilots will cross-check instruments to ensure ground clearance.
- Change of lead or wing positions must be accomplished at or above 1,500 feet AGL, unless established on radar downwind. Lead and position changes will be called over the radio and should be initiated from stabilized, wings-level attitude.

**3.19.5. Night Fingertip Position.** Fly night fingertip formation IAW MCH 11-A/OA10 Vol 5 (MCM 3-3). Ensure wingtip clearance is maintained at all times.

**\*3.19.6. Night Breakup.** Prior to a night formation breakup, the flight leader will transmit TACAN channel, radial/DME, altitude, airspeed, attitude, altimeter setting and heading, requiring wingman acknowledgment. Wingmen will also confirm good navigational aids.

**3.19.7. Night Landing.** Normally accomplish landings from an instrument straight-in approach. Refer to AFI 11-206 as supplemented for specific procedures.

- Only perform night formation landings when required to safely recover of the aircraft.

### **3.20. Night Vision Goggles (NVG) Procedures.**

**3.20.1.** USAF/MAJCOM guidance (including AFI 11-206, AFI 11-214, and AFR 160-43 (AFMAN 48-123)), outlines NVG procedures. Additionally:

- \*NVGs will only be worn in flight by NVG qualified pilots or by upgrading pilots with a qualified NVG IP in the flight.
- \*Fly with NVGs only in MAJCOM approved NVG compatible lighted cockpits. Permanently modified NVG compatible cockpits that have a degraded light source may be used for NVG missions IAW 11-A/OA10 Vol 1, 11-A/OA10 Vol 3 paragraph 3.20.9 and Attachment 10, and the A/OA-10 NVG Upgrade and Continuation Training Program message.
- **\*(PACAF) Attachment 11 outlines the PACAF approved minimum checklist items for NVG cockpit set-up.**
- NVG sorties require an operational GCAS system.
- \*All flight members will make a radio call when going "goggles on" or "goggles off" and only one flight member will don/doff goggles at a time.

**\*3.20.2.** NVGs must be preflight tested and adjusted for the individual pilot in a unit eyeline or equivalent tester prior to NVG operations. Preflight test time should allow sufficient time to fix problems and step at the prebriefed step time.

**3.20.3.** Do not wear NVGs during takeoff or landing. Do not don NVGs until at least 2,000 feet AGL or MSA (whichever is higher) in climbing or level flight. In all cases, remove NVGs a minimum of 5 minutes prior to landing.

### **3.20.4. Illumination Levels.**

- \*HIGH ILLUMINATION is defined as a minimum of 2.2 millilux illumination derived from natural or artificial sources. This roughly equates to a 20% moon disk at an elevation of 30 degrees or higher. If weather or other conditions reduce actual inflight illumination below 2.2 millilux, low illumination procedures will be followed.
- \*LOW ILLUMINATION is defined as less than 2.2 millilux.
- \*Even when illumination levels are forecast, weather or other conditions may cause actual illumination levels to be higher or lower than expected. In flight, pilots must estimate whether actual inflight illumination levels are High or Low, and determine if the existing conditions provide sufficient NVG performance to accomplish the planned mission and/or events. Pilots will comply with High or Low illumination procedures/restrictions contained here and in AFI 11-214.

**\*3.20.4.1. NVG Minimum Altitudes.** Minimum altitudes for NVG operations are based on illumination levels, inflight visibility, and the pilot's NVG category.

- \*The minimum altitude for all Cat I sorties, Cat II sorties flown under low illumination levels, or Cat II sorties flown when inflight visibility is less than 5 miles is the minimum safe altitude (MSA), as defined in paragraph 3.17.12, or IAW AFI 11-214, whichever is higher.

- \*The minimum altitude for all Cat II sorties flown under high illumination levels and with at least 5 miles inflight visibility is 1,000 feet AGL or IAW AFI 11-214, whichever is higher.
- \* **(PACAF) The minimum altitude for NVG operations is 2000 feet AGL, MSA, or IAW 11-214, whichever is higher.**

**3.20.5.** NVGs may be worn for night tanker rejoins, but will be raised to the up and stowed position or removed no later than 1 NM prior to the observation or precontact position.

**3.20.6.** Wingmen wearing NVGs will fly no closer than route formation.

**\*3.20.7 Weather restrictions.** MAJCOM established night weather restrictions apply. Pilots must be ready to transition to instruments and execute appropriate lost wingman or route abort procedures in the event they inadvertently enter the weather. Under certain IMC or marginal VFR conditions, NVGs may allow pilots to maintain visual references with relation to the ground, the horizon, other aircraft, etc. However, while wearing NVGs pilots must still comply with published VFR cloud clearance and visibility minimums, have an IFR clearance prior to entering IMC, and follow all IFR procedures while in IMC.

- \* **(PACAF) NVG VFR cloud clearances and weather minimums are: 2000 feet above or below clouds, 1 NM horizontal clearance, and 3 NM inflight visibility with a discernible horizon, or IAW AFI 11-214 or AFI 11-206, whichever is more restrictive.**

**\*3.20.8. Weapons Delivery.**

**\*3.20.8.1.** Range weather restrictions and minimum altitudes during weapons delivery passes are IAW AFI 11-214. Minimum altitudes during night surface attack operations are IAW AFI 11-214 restrictions, the pilot's NVG category minimum altitude, and the minimum altitude allowed by the actual illumination level, whichever is higher.

**\*20.8.2.** On Class A ranges, Cat II pilots, with the concurrence of the RCO, are allowed to choose external aircraft lighting settings that maximize training, minimize interference with NVGs, and still allow the RCO to safely monitor the aircraft. Depending on the lighting conditions and RCO equipment, this could involve normal, reduced, covert, or blacked-out lighting IAW AFI 11-214.

**\*3.20.8.3.** Cat II pilots may conduct normal, reduced, covert, or blacked-out lighting weapons deliveries IAW AFI 11-214 on ranges which do not require RCO control. However, when working with a GFAC/AFAC, pilots, with GFAC/AFAC concurrence, should choose external lighting settings that safely permit final control.

**\*3.20.8.4.** During all range sorties for Cat I pilots, covert or blacked-out lighting weapons deliveries may only be conducted dry.

**\*3.20.9. Aircraft Modifications.**

**\*3.20.9.1.** Cat I and II NVG training may be conducted in modified aircraft that have the following NVIS modified components: ADI, HSI, altimeter, airspeed indicator, VVI, standby ADI, engine instruments (APU instruments N/R), hydraulic gauges, fuel gage, armament control panel (ACP), HUD control panel, option select panel (LASTE), and remote frequency indicator (RFI). The lighting of these components must not be turned off due to incompatible light sources. Cat I and II NVG training may also be conducted in modified aircraft that have a non-NVIS ADI, HSI, altimeter, airspeed indicator, VVI, fuel gauge, or RFI if NVIS compatible instrument filters are installed.

**\*3.20.9.2.** Training in modified cockpits that do not meet the conditions in paragraph 3.20.9.1 above will be limited. Unit designated cadre may fly both Cat I and Cat II sorties. All other pilots are limited to Cat I sorties.

**\*3.20.9.3.** In unmodified aircraft, training will be limited to cadre IPs on Cat I sorties.

**\*3.20.9.4. Interim Cockpit Lighting Solutions.** Pilots will only use Attachment 10, Appendix B, of the A/OA-10 NVG Transition Manual, and MAJCOM approved procedures/equipment for interim cockpit lighting setup. **(PACAF) Pilots will use Attachment 11 for NVG cockpit lighting setup.**

**\*3.20.9.5.** Pilots must not become over confident in the capabilities of NVGs. Many things can cause a pilot to lose outside



visual references. Some examples are entering the weather (intentionally or inadvertently), NVG battery failure, flight into smoke or dust, flight into a shadowed area, sudden illumination of an incompatible light source inside or outside of the cockpit, etc. Pilots must ensure their primary and secondary flight instruments are sufficiently illuminated in the event they need to transition to instruments.

### **3.21. Fuel Requirements.**

**3.21.1. Joker Fuel.** A pre-briefed fuel needed to terminate an event and proceed with the remainder of the mission.

**3.21.2. Bingo Fuel.** A pre-briefed fuel state that allows the aircraft to return to the base of intended landing or alternate, if required, using preplanned recovery parameters and arriving with normal recovery fuel as defined below.

**3.21.3. Normal Recovery Fuel.** The fuel on initial or at the FAF at the base of intended landing or alternate. Establish fuel quantity locally or 1,500 pounds, whichever is higher.

**3.21.4. Minimum Fuel.** Declared whenever it becomes apparent that an aircraft will enter initial or start an instrument final approach at the base of intended landing, or alternate if required, with 1,200 pounds or less (or as established locally), or when either the Left or Right Main Fuel Low light illuminates, whichever occurs first.

**3.21.5. Emergency Fuel.** Declared whenever it becomes apparent that an aircraft will enter initial or start an instrument final approach at the base of intended landing, or alternate if required, with 800 pounds or less, or 400 pounds in either the left or right main system, whichever occurs first.

### **3.22. Approaches and Landings.**

**3.22.1.** Minimum pattern and touchdown spacing between similar landing aircraft are 3,000 feet (e.g., A/OA-10 behind A/OA-10), 6,000 feet for dissimilar aircraft (e.g., A/OA-10 behind F-15) or as directed at the landing base, whichever is higher. Increase spacing whenever anticipating wake turbulence.

**3.22.2.** The desired touchdown point for a VFR approach is 500 feet past the runway threshold, or the glidepath interception point for a precision approach. When local procedures or unique runway surface conditions require landing beyond a given point on the runway, adjust the desired touchdown point accordingly.

#### **3.22.3. Landing Restrictions.**

- When the computed landing roll exceeds 80 percent of the available runway, land at an alternate if possible.
- When the RCR at the base of intended landing is less than 12 (unless specified otherwise by MAJCOM, AFRES or ANG), land at an alternate if possible.
- **(PACAF) Minimum landing RCR is 12. The 354 Operations Group Commander may waive this restriction but in no case will landings be performed with RCRs less than 8. When the RCR is less than 12, and the crosswind component exceeds the RCR, landings are prohibited.**
- Do not land over any raised web barrier (e.g., MA-1A, 61QS11).

**3.22.4.** Normally all aircraft will land in the center of the runway and clear to the turnoff side of the runway when speed/conditions permit, unless local conditions dictate otherwise.

### **3.23. Overhead Traffic Patterns.**

**3.23.1.** Altitude and airspeed will be IAW T.O. 1A-10A-1 or as directed locally.

**3.23.2.** Overhead patterns may be made with unexpended practice ordnance, WP 2.75 rockets, night illumination flares, 30 mm, and unexpended live air-to-air ordnance.

**3.23.3.** Initiate the break over the touchdown point or as directed.

**3.23.4.** Execute the break individually in a level 180 degree turn to the downwind leg at MINIMUM intervals of 5 seconds (except IP/SEFE chase or when in tactical formation).

**3.23.5.** Aircraft will be wings level on final at approximately 300 feet AGL and 1 mile from the planned touchdown point.

### **3.24. Tactical Overhead Traffic Patterns.**

**3.24.1.** Tactical entry to the overhead traffic pattern is permitted if the following conditions are met:

- Use published overhead pattern altitude and airspeed.
- Locally develop and coordinate with appropriate air traffic control agencies specific procedures.
- Four aircraft are the maximum permitted. Aircraft/elements more than 6,000 feet in trail are considered a separate flight.
- Normally position wingmen opposite the direction of the break.
- Regardless of the formation flown, no aircraft should be offset from the runway in the direction of the break; the intent is to avoid requiring a tighter than normal turn to arrive on normal downwind.
- Fly normal downwind and base position.

### **3.25. Low Approaches.**

**3.25.1.** Observe the following minimum altitudes:

- Normal single ship low approaches—so that touchdown does not occur.
- IP/SEFE chase position—50 feet AGL.
- Formation low approaches (and non-IP/SEFE chase)—100 feet AGL.
- Chase aircraft during an emergency—300 feet AGL unless safety or circumstances dictate otherwise.

**3.25.2.** During go-around, remain 500 feet below VFR overhead traffic pattern altitude until crossing the departure end of the runway unless local procedures, missed approach/climb-out procedures, or controller instructions dictate otherwise.

**3.26. Closed Traffic Patterns.** Initiate the pattern at the departure end of the runway unless directed/cleared otherwise by local procedures or the controlling agency. Minimum airspeed during a closed pattern, prior to configuring, is 150 KIAS. When in formation, a sequential closed may be flown with ATC concurrence, at an interval to ensure proper spacing.

### **3.27. Formation Approaches and Landings.**

#### **3.27.1. General.**

- Normally accomplish formation landings from a precision approach. If not, accomplish landing utilizing a published instrument approach or a VFR straight-in approach using the VASI if available. In all cases, the rate of descent should be similar to a normal precision approach.
- A flight leader will lead continuation training formation landings. Upgrading flight leads require an IP/flight lead supervisor in the element.
- When only one aircraft is landing from a formation approach, normally the lead will execute a low approach and the wingman will land. In this event, the wingman will break off for landing as briefed, as cleared by the leader, or in the case of poor positioning, accomplish a low approach.
- Do not perform practice formation approaches above 40,000 pounds gross weight.

**3.27.2. Formation Landing Restrictions.** Aircraft configuration will be IAW paragraph 3.7.4. Formation landings are prohibited:

- When the cross wind or gust component exceeds 15 knots.
- When the runway is reported wet; or ice, slush, or snow are on the runway.
- If runway width is less than 140 feet.
- When landing with hung ordnance or unexpended live ordnance (excluding live air-to-air missiles, rockets, night illumination flares, and 30mm ammunition).
- If the weather is less than 500 feet and 1 1/2 miles or a flight member's weather category, whichever is higher.

**3.27.3. Lead Procedures.** Refer to MCH 11-A/OA10 Vol 5 (MCM 3-3).

- Establish an approach speed consistent with the heavier aircraft. Approach speed may be adjusted up to 10 KIAS higher than the minimum computed airspeed, depending on turbulence, runway length, runway condition, etc.
- Position the wingman on the upwind side if the cross wind component exceeds 5 knots.

- Plan to land near the center of your half of the runway to ensure enough runway is available for the wingman.

**3.27.4. Wingman Procedures.** Refer to MCH 11-A/OA10 Vol 5 (MCM 3-3).

- Maintain a minimum of 10 feet lateral wingtip spacing.
- Cross-check the runway to ensure proper runway alignment.
- Execute a climbout/missed approach if sufficient runway/aircraft clearance is not available.

**3.27.5. Roll-out Procedures.** Refer to MCH 11-A/OA10 Vol 5 (MCM 3-3).

- If the wingman overruns the leader, accept the overrun and maintain aircraft control on the appropriate side of the runway. Do not attempt to reposition behind the leader. The most important consideration is wing tip clearance.

**3.28. Chaff/Flare/Smoky Devil Procedures.** AFI 11-214 contains basic procedures for employment of Chaff/Flare/Smoky Devils.

**3.28.1.** Do not arm chaff/flare systems unless in an approved area with the intent to dispense chaff and/or flares.

**3.28.2.** Minimum employment altitude for Smoky Devils is 500 feet AGL.

## Chapter 4 INSTRUMENT PROCEDURES

### 4.1. Approach Category.

**4.1.1.** The A/OA-10 is Approach Category D. Accomplish missed approach in accordance with the flight manual procedures. Missed approach airspeed is 200 to 220 KIAS.

**4.1.2.** Approach category C minima may be used to an emergency/divert airfield where no Category D minima is published, provided:

- A straight-in approach is flown.
- The aircraft is flown at a computed final approach speed of 140 KIAS or less.
- Missed approach airspeed is 200 to 210 KIAS.

**4.1.3.** Missed approach airspeeds are based on 260 TAS or less for Category D approaches and 240 TAS or less for Category C approaches. At high pressure altitudes and temperatures, these true airspeeds may not be compatible with published missed approach airspeeds and the approach should not be flown.

**4.1.4.** A/OA-10s are approved to use INS for enroute Area Navigation (RNAV). Enroute INS navigation may be used for a period not to exceed 1 1/2 hours between INS updates. An update is defined as establishing a positive position using visual references or TACAN. RNAV approaches have not been adopted for use by the USAF and will not be flown.

### 4.2. Instrument Trail Departure - General.

**4.2.1.** The flight leader will notify the appropriate ATC agency when a VMC joinup will not be accomplished due to weather conditions or operational requirements, and coordinate for an appropriate altitude reservation. Formation in-trail departures will comply with instructions for a non-standard formation flight as defined in FLIP. Flight lead should request IFF squawks for wingmen in trail.

**4.2.2.** Do not sacrifice basic instrument flying when performing secondary trail tasks during trail departures in IMC. Strictly adhere to the briefed climb speeds, power settings, altitudes, headings, and turn points. If task saturation occurs, cease attempts to maintain trail, immediately concentrate on flying the instrument departure, and notify the flight lead.

**4.3. Formation Instrument Trail Procedures.** Refer to MCH 11-A/OA10 Vol 5 (MCM 3-3).

**4.3.1.** Use takeoff spacing as briefed by the flight leader, but no less than 20 seconds.

**4.3.2.** Each aircraft/element will accelerate to 200 KIAS. Climb speed will be 200 KIAS and power setting will be 93 percent engine core speed unless specifically briefed otherwise.

**4.3.3.** Each aircraft/element will climb on takeoff heading to 1,000 feet AGL and accelerate to 200 KIAS before initiating any turns, except when departure instructions specifically preclude compliance.

**4.3.4.** Each aircraft/element will call passing each 2,000 foot altitude increment (or as briefed) with altitude and heading (or heading passing) until joinup or level off. In addition, each aircraft/element will call initiating any altitude or heading change. Acknowledgments are not required; however, it is imperative that preceding aircraft/elements monitor the radio transmissions and progress of the succeeding aircraft/elements and adhere to the departure route.

**4.3.5.** Each aircraft/element will maintain the briefed trail takeoff spacing using all available aircraft systems and navigational aids to monitor position.

**4.3.6.** Each aircraft/element will maintain at least 1,000 feet vertical separation from the preceding aircraft/element during the climb and at level off except in instances where departure instructions specifically preclude compliance. If unable to comply with MEA, the 1,000 foot vertical separation may be reduced to 500 feet.

**4.3.7.** If unable to accomplish a visual joinup on top or at level off, the flight leader will request 1,000 feet of altitude

separation from ATC for each succeeding aircraft/element, providing all aircraft can comply with MEA restrictions.

**4.4. Formation Breakup/Spacing Procedures.** Formation breakup should not be accomplished in IMC; however, if unavoidable, accomplish the breakup in straight and level flight. Prior to a weather breakup, the flight leader will transmit attitude, airspeed, altitude, altimeter setting, and heading. All wingmen acknowledge the transmission. Wingmen will also confirm good navigational aids.

**4.5. Formation Penetration.**

**4.5.1.** Formation penetrations are restricted to two aircraft when the weather at the base of intended landing is less than overhead traffic pattern minimums. Three-ship penetrations are authorized for ASLAR approaches in accordance with AFM 13-214 and MAJCOM Supplement.

**4.5.2.** If flying a formation landing, the wingman should be positioned on the appropriate wing prior to weather penetration.

**4.6. Formation Approach.** In IMC, formation flights will not change lead/wing positions below 1,500 feet AGL or instrument downwind altitude, whichever is lower.

**4.7. Use of the Heads-Up Display.** The HUD may be used as an additional instrument reference in night/IMC conditions; however, do not use it as the sole instrument reference in these conditions. In addition, do not use the HUD to recover from an unusual attitude or when executing lost wingman procedures except when no other reference is available.

**4.8. Simulated Instrument Flight.** Logging simulated instrument flight in an A/OA-10 requires a chase aircraft. This does not preclude flying multiple approaches in VMC without a chase; however, in this case the PRIMARY emphasis will be on the "See and Avoid" concept. Chase aircraft will be in a position from which they can effectively clear and/or provide assistance. Chase aircraft may move into close formation on final if flying a formation landing and terminating simulated instrument flight.

## Chapter 5 AIR-TO-AIR WEAPONS EMPLOYMENT

### 5.1. General.

**5.1.1. References.** AFI 11-214 contains air-to-air procedures to include operations with live ordnance (air-to-air missiles) applicable to all aircraft. The procedures contained in this chapter specify additional procedures or restrictions that are applicable to A/OA-10 operations.

**5.1.2.** This chapter applies to all missions where the intent is to conduct maneuvers used to defeat aerial attacks or to employ ordnance against airborne fixed wing aircraft or helicopters. Fixed wing air-to-air training should emphasize visual acquisition of threats, maneuvering to negate any attack, mutual support, and forcing the attacker to disengage. Anti-helicopter air-to-air training should emphasize visual search techniques, maneuvers to negate helicopter attacks, aspect and range determination, and weapons selection and employment to kill the threat.

**\* 5.1.3. (PACAF) During high-aspect BFM training, a dedicated defender and offender must be clearly identified for each engagement. The offender will have some kind of advantage (power, G available, lead turn advantage at the merge). During upgrade training (MQT/FLUG/IPUG), high-aspect BFM will be conducted IAW the appropriate syllabus.**

**5.2. Simulated Gun/AIM-9 Employment.** Simulated Gun/AIM-9 employment is governed by the following:

**\*5.2.1.** Simulated attacks using the gun trigger and AIM-9 pickle button are allowed if the following conditions are met:

- The GUN IS PINNED
- Rounds limit switch is in LIMIT.
- Rounds limit counter is ZERO.
- Gun rate switch is SAFE.
- Cold trigger check is accomplished and acknowledged throughout the flight.
- Master Arm switch is ARM, SAFE, or CAMERA. (If in SAFE or CAMERA, pickle button initiated AIM-9 employment is inoperative.)

**NOTE:** If expendable practice ordnance is aboard the aircraft, check all release modes OFF, no weapons stations selected, fusing SAFE, and acknowledged throughout the flight, prior to cold trigger check.

**5.2.2.** Simulated Gun attacks are allowed when the GUN IS UNPINNED if the following conditions are met: Gun rate switch is SAFE.

- Master Arm switch is in SAFE or CAMERA. (Pickle button initiated AIM-9 employment is inoperative.)
- Cold trigger check is accomplished and acknowledged throughout the flight.
- Gun trigger is NOT DEPRESSED during attacks.

**5.2.3.** Attacks using pickle button initiated AIM-9 employment are allowed when the GUN IS UNPINNED if the following conditions are met:

- Gun rate switch is SAFE.
- Master Arm switch is ARM.
- Cold trigger check is accomplished and acknowledged throughout the flight.
- **NOTE:** If expendable practice ordnance is aboard the aircraft, check all release modes OFF, no weapons stations selected, fusing SAFE, and acknowledged throughout the flight, **PRIOR TO COLD TRIGGER CHECK.**
- SIMULATED GUN ATTACKS ARE NOT PERMITTED WITH MASTER ARM IN THE ARM POSITION.

### 5.3. Maneuvering Limits.

**5.3.1.** The minimum airspeed during ACBT is 120 KIAS.

**5.3.2.** Pilots will not maintain an AOA that triggers the chopped stall warning tone.

**5.3.3.** The minimum maneuvering airspeed during LOWAT is 240 KIAS for both defensive and Baron offensive maneuvering.

**5.3.4.** Negative G guns jink out maneuvers are prohibited.

**\*5.3.5. (PACAF) Night Air-to-Air weapons events will not be accomplished without specific MAJCOM approval.**

## Chapter 6 AIR-TO-SURFACE WEAPONS EMPLOYMENT

**6.1. General.** References: MCM 3-1, MCH 11-A/OA10 Vol 5 (MCM 3-3), T.O. 1A-10-34-1-1, T.O. 1A-10-34-1-2, T.O. 1A-10-26, and FWS Instructional Texts are primary references for fighter weapons employment theory, planning, techniques, and analysis. MCI 11-A/OA10 Vol 1 contains qualification and scoring criteria. AFI 11-214 contains operating and training procedures.

**6.2. Weather Minimums.** Refer to AFI 11-214. Weather ceiling will be no lower than 1,500 ft AGL.

**6.3. Battle Damage/Bomb Checks.** If circumstances permit, flight leads will direct a battle damage/bomb check prior to or during RTB. This check is mandatory following the expenditure of live ordnance (including all types of 30mm ammunition). Observe established deconfliction responsibilities and position change procedures. Formation spacing will be no closer than normal fingertip.

### 6.4. Training Rules.

**6.4.1.** Refer to AFI 11-214. If airspeed decreases below 210 KIAS in a pop-up attack, abort the maneuver. Base this airspeed on typical training weights and configurations. At heavy gross weight, adjust abort airspeed upward to provide sufficient G and turning room to recover from an adverse flight condition.

**\*6.4.2.** Pilots must positively identify the target prior to weapons release. Achieve positive identification by either visually acquiring the target or by confirming target location through valid on-board/off-board cues. These cues include marking rounds, Pave Penny spot, IR Maverick lock-on, IR pointers, or other NVG compatible marking devices. Pilots should exercise caution and possess a high level of target situational awareness when relying on a single target cue to confirm target location (e.g., employment at night with a Pave Penny spot alone, in the absence of no other confirming cues). In some situations, laser spots have shifted from the designated target to the laser source. For this reason, Pave Penny should not be used as the sole source for target identification.

**\*6.4.2.1. Pave Penny Procedures.** Due to the possibility of false target indications, attack heading should avoid the target-to-laser designator safety zone.

- The safety zone is a 20 degree fan whose apex is at the target and extends 10 degrees either side of the target-to-laser designator line. The optimal attack zone is a 120 degree fan whose apex is at the target and extends to 60 degrees either side of the target-to-laser designator line, excluding the safety zone.
- However, in some situations, laser spots have shifted from the designated target to the laser source while operating in the optimal attack zone. Pave Penny should not be used as a sole source for target identification.

### 6.4.3. FTU/MQT pilots:

- Will not change targets once roll-in to final is initiated except during two-target strafe.
- Will not perform element pop-ups. This does not preclude IP chase or tactical formation ingress to the target.

### 6.5. Live Ordnance Procedures.

**6.5.1.** Refer to AFI 11-214.

**6.5.2.** Do not make simulated weapon delivery passes on targets occupied by personnel.

**\*6.5.3.** When Ground Controllers are operating on Class B/C ranges the following procedures apply:

**\*6.5.3.1.** All pilots will be familiar with applicable range weapons delivery procedures, appropriate targets and weapons footprints.

**\*6.5.3.2.** Ground personnel locations will be briefed and acknowledged by all pilots.

**\*6.5.3.3.** Pilots will not expend ordnance if any doubt exists as to the ground personnel or intended target locations.



## 6.6. Off-Range Simulated Weapons Employment.

### 6.6.1. AFI 11-214 and the following apply:

- Do not conduct off-range simulated weapons employment with hung ordnance aboard the aircraft.
- \*Do not conduct off-range simulated weapons employment with live ordnance (except 30 mm) aboard the aircraft.

### 6.6.2. When 30mm ammunition is loaded, pilots will not actuate the gun trigger unless the following conditions are met:

- Gun is pinned.
- Rounds limit switch is in LIMIT.
- Rounds limit counter is zero.
- Gun rate switch is SAFE.
- Cold trigger check is accomplished and acknowledged throughout the flight.
- Master Arm switch is in the SAFE or CAMERA position. (Exception: The Master Arm switch may be placed in the Arm position only on ranges utilizing the ACMI interface system.)

### 6.6.3. Pilots WILL NOT actuate the pickle button when expendable training ordnance (except 30 mm) is aboard the aircraft. The Master Arm switch will be in the SAFE or CAMERA position.

### 6.6.4. Off-range TGM-65 Maverick attacks may be conducted with the Master Arm switch in ARM, utilizing the pickle button, when observing the following conditions:

- No expendable practice ordnance (except 30 mm) is aboard the aircraft
- Confirm E/O in the appropriate stores loading display window and only the TGM station is selected.
- The MECH FUZING and GUN RATE switches are SAFE.
- Complete appropriate weapons delivery checklist items.
- **NOTE:** For off-range Maverick attacks, the desired aircraft configuration is not to have expendable practice ordnance (except 30 mm) aboard the aircraft.

## 6.7. Joint Air Attack Team (JAAT).

### 6.7.1. MCM 3-1 and TACP 50-20 are the primary references for JAAT procedures, and techniques.

### 6.7.2. Aircraft/helicopter separation. Helicopters normally operate from surface to treetop, Nap of the Earth (NOE). If helicopters are unable to hover in ground effect, or operate NOE, ensure altitude separation through one or both of the following methods:

- Establishing altitude blocks with at least 100 feet separation between the top of the helicopter block and the bottom of the A-10 block.
- Employing attack routes/sectors or timing procedures that ensure deconfliction.

### 6.7.3. Normal air-to-surface training rules apply. In addition, anytime uncertainty about helicopter positioning, or a flight path conflict arises, terminate attacks by a Knock-It-Off call. A-10s will climb immediately and maneuver to avoid any conflict.

### 6.7.4. Radio frequencies. All participants must monitor one common frequency.

### 6.7.5. Briefings.

- Maximum training is achieved when helicopter and A-10 pilots operate from the same location. Operations should be from an airfield that will allow direct face-to-face contact between all participants (helicopter pilots, FACs, and A-10 pilots) for flight briefings/debriefings.
- As a minimum, one JAAT qualified A-10 flight lead from the participating unit will interface with the helicopter unit. This interface will include a review of training objectives, training constraints (airspace/pilot limitations, etc.), training rules, and joint/combined operating procedures. Then brief all participating aircrews on the training rules, objectives, etc.
- Accomplish mass briefings/debriefings prior to and following JAAT exercises whenever possible.
- When face-to-face flight briefings are not feasible, accomplish telephone briefings.

**6.8. Search and Rescue Training.**

**6.8.1.** MCM 3-1 is the primary reference for wartime SAR procedures, techniques, and planning. For peacetime SAR considerations, see para. 7.12.

## Chapter 7 ABNORMAL OPERATING PROCEDURES

**7.1. General.** This chapter contains procedures to follow when other than normal operations occur. They do not, however, replace or supersede procedures contained in the flight manual or the use of sound judgment.

**7.1.1.** Accept no aircraft for flight with a malfunction addressed in the emergency/abnormal procedures section of the flight manual (except INS, LASTE, or IFF Mode 4 failure) until completing appropriate corrective actions.

**7.1.2.** Do not taxi aircraft with malfunctions that affect the nosewheel steering or brake systems.

**7.1.3.** After isolating and/or correcting a malfunctioning system, do not use that system again unless its use in a degraded mode is essential for recovery. Do not conduct in-flight trouble shooting after completing flight manual emergency procedures.

**\*7.1.4.** When a fuel imbalance is greater than T.O. 1A-10A-1 limits, terminate tactical maneuvering and investigate. If the fuel imbalance was caused by a slow feeding tank that can be corrected, vice a fuel system failure, the mission may continue IAW T.O. 1A-10A-1 guidance. Terminate the mission if fuel imbalance cannot be corrected. Instruments, medium altitude navigation, deployment missions, and level weapons deliveries are authorized profiles to reduce gross weight.

### **7.2. Ground Aborts.**

**7.2.1.** When a flight member aborts prior to takeoff, the flight leader will normally realign (or align as briefed) flight positions to maintain a numerical call sign sequence. Flight leaders will advise the appropriate agencies of such changes.

**7.2.2.** A flight of two or more aircraft with only one designated flight lead in the formation must either sympathetically abort or proceed on a pre-briefed single-ship mission should the flight lead abort.

**7.2.3.** Pilots who do not takeoff with the flight may join the flight at a briefed rendezvous point prior to a tactical event, or may fly a briefed alternate single-ship mission. FTU students may also follow this procedure if allowed by the appropriate syllabus, and approved by the squadron commander or operations officer. If accomplishing a joinup on an air-to-ground range, terminate all events until the joining aircraft has achieved proper spacing.

### **7.3. Takeoff Aborts.**

**7.3.1.** Prior to flight, every member of the flight will review and understand takeoff data. Place particular emphasis on takeoff and abort factors during abnormal situations such as short/wet runway, heavy gross weights, and abort sequence in formation flights.

**7.3.2.** If an abort occurs during takeoff roll, clear to the appropriate side of the runway as expeditiously as possible based on position within the element. If this is not feasible because of possible barrier engagement, clear straight ahead. As soon as possible, give call sign and state intentions. Following aircraft will alter takeoff roll to ensure clearance or will abort takeoff if unable to maintain adequate clearance.

**7.3.3.** Anytime an aircraft experiences a high speed abort and hot brakes are suspected:

- Declare a ground emergency.
- Taxi the aircraft to the designated hot brake area and perform hot brake procedures.

### **7.4. Air Aborts.**

**7.4.1.** If an abort occurs after takeoff, all aircraft will maintain their original numerical call sign.

**7.4.2.** The pilot of an aborting aircraft will advise the flight leader of the conditions necessitating the abort, intentions, and assistance required.

**7.4.3.** If the flight leader aborts, the designated deputy leader will assume command of the flight.

**7.4.4.** Escort aborting aircraft with an emergency condition to the field of intended landing. When other than an emergency condition exists, the flight leader will determine if the aborting aircraft requires an escort.

**7.4.5.** Abort the mission, regardless of apparent damage or subsequent normal operation, for any of the following:

- Birdstrike/Foreign Object Damage.
- Over-G. The aircraft will land as soon as practical out of a straight-in approach.
- Flight control system anomalies. Declare an emergency, even if the malfunction appears corrected.
- Engine flameout/stagnation or shutdown. This applies even if a successful restart is accomplished. (Exception: Intentional shutdowns for FCFs.)

## **7.5. Radio Failure.**

**7.5.1. General.** Individual aircraft experiencing radio failure will comply with procedures outlined in FLIP, AFI 11-205, AFI 11-206, this regulation, and local directives.

### **7.5.2. Formation.**

- Flight members who experience total radio failure while in close or route formation will maneuver within close/route parameters to attract the attention of another flight member and give the appropriate visual signals. Terminate the mission as soon as practical and lead the NORDO aircraft to the base of intended landing or a divert base. Perform a formation approach to a drop-off on final unless safety, fuel, weather, or other considerations dictate otherwise.
- \*If flying other than close/route formation when radio failure occurs, the NORDO aircraft should attempt to rejoin to a route position on another flight member. The joining/wing aircraft is responsible for deconfliction until the other flight member acknowledges his presence by a wing rock, signifying clearance to join. Once joined, the NORDO aircraft will give the appropriate visual signals. If prebriefed, the NORDO aircraft may proceed to a rendezvous point and hold. If no one has rejoined prior to reaching BINGO fuel, the NORDO aircraft should proceed to the base of intended landing or a divert base IAW paragraph 7.5.1. above. Aircraft experiencing any difficulty/emergency in addition to NORDO will proceed as required by the situation.

### **7.5.3. Surface Attack NORDO Procedures for Class A/Manned Class B Ranges.**

- Attempt contact with the RCO on the appropriate backup frequency.
- If unable to re-establish contact, make a pass by the range control tower on the attack heading while rocking wings, and turn in the direction of traffic. The flight leader will either rejoin on the NORDO aircraft and RTB, or direct another flight member to escort the NORDO to a recovery base.
- If the NORDO aircraft has an emergency, make a pass by the range control tower, if practical, on the attack heading while rocking wings, turn opposite the direction of traffic, and proceed to a recovery base. The flight leader will either rejoin on the NORDO aircraft, or direct another flight member to join up and escort the emergency aircraft.
- If the RCO experiences radio failure, the flight will hold high and maintain spacing while attempting contact on primary and backup frequencies.
- If radio failure occurs and circumstances preclude landing with unexpended ordnance, safe jettison of ordnance may be accomplished provided the following conditions are met:
- The NORDO aircraft joins on another flight member that has radio contact with the RCO and the remainder of the flight.
- Stores jettison visual signals specified in AFI 11-205 are relayed to the NORDO aircraft to initiate jettison.

### **7.5.4. Surface Attack NORDO Procedures for Unmanned Class B and Class C Ranges.**

- \*Make a "high and dry" pass on the target, if possible, while rocking wings.
- The leader will either rejoin the flight in sequence and recover, or direct another flight member to escort the NORDO aircraft to a recovery base.
- If the NORDO has an emergency, he will, if practical, make a pass on the target, rocking wings, turn opposite direction of traffic, and proceed to a recovery base. The flight leader will either rejoin on the NORDO aircraft, or direct a flight member to join up and escort the emergency aircraft.

**7.5.5. NORDO Recovery.** The procedures in AFI 11-205 and FLIP apply.

- If flying a straight-in approach and a go-around becomes necessary, the chase will go-around, pass the NORDO aircraft and rock his wings.
- The NORDO aircraft will go-around if the situation allows. If the NORDO aircraft is in formation as a wingman, the

leader will initiate a gentle turn into the wingman and begin the go-around.

#### **7.6. Severe Weather Penetration.**

**7.6.1.** Do not attempt flight through severe weather; however, if unavoidable, prior to severe weather penetration, obtain separate clearances. If not feasible, flights may assume an in-trail formation with a minimum of 1 NM separation between aircraft/elements. Obtain ATC clearance for a non-standard formation.

**7.7. Lost Wingman Procedures.** In any lost wingman situation, immediate separation of aircraft is essential. Upon losing sight of the leader, or if unable to maintain formation due to spatial disorientation (SD), the wingman will simultaneously execute the applicable lost wingman procedures while transitioning to instruments and inform the flight lead. Refer to paragraph 7.8 for specific SD considerations. Smooth application of control inputs is imperative to minimize the effects of SD. Permission from the flight lead is required to rejoin the flight once lost wingman procedures have been executed.

#### **7.7.1. Two- or Three-Ship Flights.**

**7.7.1.1. Wings-Level Flight.** In wings-level flight (climb, descent, or straight and level) simultaneously inform the leader and turn away using 15 degrees of bank for 15 seconds, then resume heading and obtain separate clearance.

##### **7.7.1.2. Turns.**

- **OUTSIDE THE TURN.** Reverse the direction of turn using 15 degrees of bank for 15 seconds and inform the leader. Continue straight ahead to ensure separation prior to resuming the turn. Obtain a separate clearance.
- **INSIDE THE TURN.** Momentarily reduce power to ensure nose-tail separation, and inform the flight leader to roll out of the turn. Maintain angle of bank to ensure lateral separation and obtain separate clearance. Once assured separation, the leader may resume turn.
- **NOTE:** If in three-ship echelon, refer to four-ship lost wingman procedures.

**7.7.1.3. Precision/Non-Precision Final.** The wingman will momentarily turn away to ensure separation, inform lead, and commence the published missed approach procedure while obtaining a separate clearance from approach control.

**7.7.1.4. Missed Approach.** The wingman will momentarily turn away to ensure separation, inform lead, and continue the published or assigned missed approach procedure while climbing to 500 feet above missed approach altitude. Obtain a separate clearance from approach control.

**7.7.2. Four-Ship Flights.** If only one aircraft in the flight becomes separated, the previous procedures will provide safe separation; however, since it is impossible for number 4 to immediately ascertain that number 3 still has visual contact with the leader, it is imperative that number 4's initial action be based on the assumption that number 3 has also become separated. Number 2 and 3 will follow the procedures outlined above. Number 4 will follow the appropriate procedure listed below:

**7.7.2.1. Wings-Level Flight.** Simultaneously inform the leader and turn away using 30 degrees of bank for 30 seconds, then resume heading and obtain separate clearance.

##### **7.7.2.2. Turns.**

- **OUTSIDE THE TURN:** Reverse direction of turn using 30 degrees of bank for 30 seconds to ensure separation from lead and number 3 and obtain separate clearance.
- **INSIDE THE TURN:** Momentarily reduce power to ensure nose-tail separation and increase bank angle by 15 degrees. Inform the leader to roll out. Obtain separate clearance. Leader will resume turn only when separation is ensured.

**7.7.3.** The flight leader should acknowledge the lost wingman's radio call and transmit attitude, heading, altitude, airspeed, and other parameters as appropriate. Wingman will base lost wingman procedure on the flight lead's transmitted parameters. Use caution observing published terrain clearance limits.

**7.7.4.** If a wingman becomes separated and any aircraft experiences radio failure, the aircraft with the operational radio will obtain a separate clearance. The NORDO aircraft will turn the IFF/SIF to the appropriate code listed in the Flight Information Handbook or IAW national rules while proceeding with the previous clearance. If an emergency situation arises along with radio failure, turn the IFF/SIF to emergency (7700) for the remainder of the flight.

7.7.5. Practice lost wingman procedures only in VMC.

7.7.6. With flight lead permission, wingmen may join if weather conditions permit a visual joinup.

**7.8. Spatial Disorientation.** Conditions which prevent a clear visual horizon or increase pilot tasking are conducive to SD. To prevent SD, the pilot will make a conscious attempt to increase instrument cross-check rate. When SD symptoms are detected, take the following steps until symptoms abate.

**7.8.1. Single Ship.**

- Concentrate on flying basic instruments with frequent reference to the attitude indicator. Use heads-down instruments. Defer non-essential cockpit tasks.
- If symptoms persist, bring aircraft to straight and level flight with reference to the attitude indicator, conditions permitting. Maintain straight and level flight, terrain permitting, until symptoms abate, usually 30 to 60 seconds.
- If necessary, declare an emergency and advise ATC.
- **NOTE:** It is possible for SD to proceed to the point where the pilot is unable to see, interpret, or process information from the flight instruments. Aircraft control in such a situation is impossible. A pilot must recognize when physiological/psychological limits have been exceeded and be prepared to abandon the aircraft.

**7.8.2. Formation Lead.**

- A flight lead with SD will advise wingmen that lead has SD and will comply with procedures in paragraph 7.8.1. above.
- If possible, wingmen should confirm attitude and provide verbal feedback to lead.
- If symptoms persist, terminate the mission and recover the flight by the simplest and safest means possible.

**7.8.3. Formation Wingman.**

- Wingman will advise lead when disorientation makes it difficult to maintain position.
- Lead will advise wingman of aircraft attitude, altitude, heading, and airspeed.
- If symptoms persist, lead will establish straight and level flight for 30 to 60 seconds, conditions permitting.
- If the above procedures are not effective, lead should consider passing the lead to the wingman, provided the leader will be able to maintain situation awareness from a chase position. Transfer lead while in straight and level flight. Once assuming the lead, maintain straight and level flight for 60 seconds. If necessary, terminate the tactical mission and recover by the simplest and safest means possible.

**7.8.4. Greater than Two-Ship Formation.** Lead should separate the flight into elements to more effectively handle a wingman with persistent SD symptoms. Establish straight and level flight IAW paragraph 4.4 (Formation Breakup). The element with the SD pilot will remain straight and level while the other element separates from the flight.

**7.9. Armament System Malfunctions.**

**7.9.1. Inadvertent Release.**

- Record switch positions at the time of inadvertent release and provide to armament and safety personnel. Record the impact point, if known.
- Check armament switches safe and do not attempt further release in any mode. Treat remaining stores as hung ordnance and obtain a chase aircraft during RTB, if practical.
- If remaining stores present a recovery hazard, jettison in a suitable area on a single pass, if practical.

**7.9.2. Failure to Release/Hung Ordnance.** If ordnance fails to release when all appropriate switches are set, proceed as follows:

**7.9.2.1. Live Ordnance.** For hung live ordnance or an aircraft malfunction that precludes further live weapons delivery, refer to T.O. 1A-10A-34-1-1. The following procedures also apply:

- Note all release and fusing switches, then safe.
- Attempt to jettison store(s) using jettison or alternate delivery mode. Consider attempting to jettison the rack if ordnance is unsecure or unable to determine security.
- If ordnance remains on the aircraft, follow the hung ordnance recovery procedures.

**7.9.2.2. Practice/Inert Ordnance.**

- Re-check switch positions and make an additional attempt to expend. If no release occurs, select another mode of delivery in an attempt to expend.
- If the secondary release mode fails, ordnance from other stations/dispensers may be released providing the aircraft will remain within symmetrical load limits.
- If remaining stores present a recovery hazard, jettison in a suitable area on a single pass, if practical.
- If ordnance remains on the aircraft, follow the hung ordnance recovery procedures.

**7.9.3. Hang Fire/Misfire - General.**

- A missile that fires but fails to depart the aircraft is a hang fire. If this occurs, the chase pilot should closely observe and safety check the missile.
- A missile that fails to fire when all appropriate switches were selected is a misfire. If this occurs, safe the Master Arm switch and follow the hung ordnance recovery procedures.
- T.O. 1A-10A-34-1-1 contains hang fire/misfire procedures for specific ordnance types.

**7.9.4. Gun Unsafe.** Refer to T.O. 1A-10A-34-1-1. The following procedures also apply:

- \*If the gun unsafe light is accompanied by any unusual noise/vibration, or any other indication of gun/aircraft damage, the pilot will declare an emergency.
- Accomplish gear lowering over an unpopulated area.

**7.9.5. Recovery with Weapons Malfunction/Hung Ordnance.**

- If practical, visually inspect the aircraft for damage.
- Declare an emergency (not required for hung practice/inert ordnance or rockets).
- Obtain a chase aircraft, if available, and avoid populated areas and trail formations.
- Land from a straight-in approach, or IAW local hung ordnance procedures.

**7.9.6. Miscellaneous Procedures.**

- Pilots will not attempt to expend ordnance using a delivery system with a known weapons release malfunction.
- When abnormal missile launch or erratic missile flight is noted after launch, another aircraft will visually inspect the launching aircraft (if possible) to determine if any damage has occurred.

**7.10. In-flight Practice of Emergency Procedures.**

**7.10.1. Simulated Emergency Procedures - Definition.** Any procedure that produces an effect that would closely parallel the actual emergency such as retarding the throttle to idle and disengaging the SAS to simulate a single engine situation.

**\*7.10.2. Aborted Takeoff Practice.** Accomplish all practice and/or training related to aborted takeoffs in the Cockpit Familiarization Trainer (CFT), or a static aircraft (if trainers unavailable).

**7.10.3.** Practice in-flight engine shutdown is prohibited (except during FCF profiles).

**7.10.4.** While inflight, simulated loss of both engines is prohibited.

**7.10.5. Simulated Single Engine Approach/Landing.**

- Do not initiate simulated single engine failure below 1,000 feet AGL and terminate if the aircraft descends below 800 feet AGL prior to base leg or the airspeed drops below computed final approach speed for the aircraft configuration.
- Follow procedures in T.O. 1A-10A-1 for emergency landing patterns and actual single engine approaches as appropriate for the simulated engine failure situation. Pilots will engage anti-skid prior to landing.
- Pilots will plan approaches to avoid turns into the simulated dead engine when practical. If turns into the simulated dead engine are necessary, plan patterns to minimize bank angle.
- IQT or MQT pilots will not perform simulated single engine full stop landings unless chased by an IP.
- \*SSE approaches will be discontinued if the airspeed decreases below computed single engine final approach speed.

**7.10.6. (PACAF) Simulated Single Engine (SSE) Go Around Training.**

- **Simulated Single Engine (SSE) go arounds from SSE approaches may be practiced at low altitude provided the**

event is chased by an MR/MC pilot (inexperienced pilots require IP/ Squadron Supervisor chase the first time a SSE is flown at low altitude), and the aircraft does not descend below 300 feet AGL.

- Descents below 300 feet AGL are permitted, provided the approach terminates in a full stop landing, or the go-around is performed with both engines.
- Low altitude SSE go-arounds will be specifically planned and briefed prior to flight. The briefing should include a review of differences between actual versus SSE go-arounds. Emphasis during the go-around will be on maintaining proper airspeed and rudder application to ensure directional control.
- SSE go-arounds will be discontinued if airspeed decreases below computed single engine go-around speed.

**7.10.7.** Practice of emergency landing patterns at active airfields are authorized provided that:

- Adequate crash rescue and air traffic control facilities are available and in operation.
- \*The pilot is MR/MC. MQT pilots may practice emergency landing patterns when chased by a qualified flight lead. IQT pilots must be chased by an IP.
- Radio calls at pattern entry and as directed locally or by the controlling agency include the type emergency being simulated.

**7.11. Manual Reversion Approach and Landing.** Factors to consider are pilot proficiency, instrument approach facilities, runway conditions, weather at the recovery field, and any accompanying aircraft malfunctions. Controlled bailout is recommended anytime existing conditions may preclude a safe recovery or during single engine operations.

**7.12. Search and Rescue (SARCAP) Procedures.** In the event an aircraft is lost inflight, actions must begin to locate possible survivors and initiate rescue efforts. It is critical all flight members aggressively pursue location and rescue of downed personnel even though they seem uninjured. Many downed aircrews initially suffer from shock or have delayed reactions to ejection injuries. The following procedures are by no means complete and may require adjustment to meet each unique search and rescue situation. Chapter 8, Local Operating Procedures, Section F, Abnormal Procedures, details specific procedures.

**7.12.1. SQUAWK.** Immediately terminate maneuvering using appropriate Knock-It-Off procedures. Establish a SARCAP commander. Place IFF to EMER to alert ATC/GCI of the emergency situation.

**7.12.2. TALK.** Communicate the emergency situation and aircraft/flight intentions immediately to control agencies. Use GUARD frequency if necessary.

**7.12.3. MARK.** Mark the last known position of survivor/crash site using any means available. Use TACAN/INS position, ATC/GCI positioning, or ground references to identify the immediate area for subsequent rescue efforts.

**7.12.4. SEPARATE.** Remain above the last observed parachute altitudes until determining the position of all possible survivors. Deconflict other aircraft in the SARCAP by altitude to preclude midair collision. Establish high/low CAPs as necessary to facilitate communications with other agencies.

**7.12.5. BINGO.** Revise BINGO fuels or recovery bases as required to maintain maximum SARCAP coverage over survivor/crash site. Do not over fly BINGO fuel. Relinquish SARCAP operation to designated rescue forces upon their arrival.



## Chapter 8 LOCAL OPERATING PROCEDURES

**8.1.** This chapter is reserved for unit local operating procedures. Procedures herein will not be less restrictive than those contained elsewhere in this regulation, nor intended to be a single source document for procedures contained in other directives or regulations. Avoid unnecessary repetition of guidance provided in other established directives; however, reference to those directives is acceptable when it serves to facilitate location of information necessary for local operating procedures. This chapter is authorized to be issued to each A/OA-10 pilot. MAJCOMs or other subordinate agencies (NAF, Center, etc.), may direct publication approval channels and a specific format for Chapter 8 based on unique flying areas, missions, and/or procedures.

**8.2.** Unless changed by MAJCOM or subordinate agency, the following procedures apply:

**8.2.1.** When published, units will forward copies to MAJCOM and appropriate subordinate agencies, who will review the Chapter 8 and return comments/required changes back to the unit(s), if appropriate. The process need not delay distribution unless specified otherwise by MAJCOM or a subordinate agency. If a procedure applies to all A/OA-10 units it will be incorporated into the basic regulation.

**8.2.2.** Organize the local chapter in the following format to include, but not limited to, the following:

- Section A. Introduction.
- Section B. General Policy.
- Section C. Ground Operations.
- Section D. Flying Operations.
- Section E. Weapons Employment.
- Section F. Abnormal Procedures.
- Attachments. (Illustrations)

**8.2.3.** This chapter will include procedures for the following, if applicable:

- Command and Control.
- Fuel Requirements and Bingo Fuels.
- Diversion Instructions.
- Jettison Areas (IFR/VFR).
- Jettison Procedures/Parameters
- Controlled Bailout Areas.
- Local Weather Procedures.
- Securing Aircraft After Emergencies
- Approved Alternate Missions.
- Cross-Country/Serviceing Procedures.
- Search and Rescue (SARCAP) Procedures.

**8.2.4. (PACAF) This chapter will also include local guidance detailing maximum allowable wind and sea states for flying operations.**

**Chapter 9**  
**MAJOR COMMAND OPERATING PROCEDURES**

This chapter may be published by the individual command to delete, change, or insert procedures as applicable and approved by that command.

JOHN M. McBROOM, Maj General, USAF  
Director of Operations

**Attachment 1  
GENERAL BRIEFING GUIDE**

**MISSION PREPARATION**

1. Time Hack
2. EP/Threat of the Day
3. Mission Objective(s)
4. Mission Overview
5. Mission Data Card
  - \*a. Mission Commander/Deputy Lead
  - \*b. Joker/Bingo Fuel
  - \*c. Takeoff and Landing Data
  - \*d. Working Area
6. Environmental Conditions
  - \*a. Weather/TDA
    - b. Sunrise/Sunset (If Applicable)
    - c. Moon Illumination (If Applicable)
7. NOTAMs
8. Personal Equipment
9. FCIF/Pubs/Maps

**GROUND PROCEDURES**

1. Pre-Flight
  - a. Aircraft
  - b. Armament
2. Ground Crew Briefing (When Applicable)
  - a. Act only on Pilot's instructions
  - b. Ground emergency procedures
  - c. Hand signals
  - d. Aircraft Danger Areas
3. Check-in
4. Taxi/Marshaling/Arming
5. Spare Procedures

**TAKEOFF**

1. Runway Lineup
2. Formation Takeoff
3. Takeoff Interval
4. Abort
5. Landing Immediately After Takeoff

**DEPARTURE**

1. Joinup
2. Formation
3. Ops Checks

**RECOVERY**

1. Rejoin
2. Battle Damage/Bomb Check (If Applicable)
3. Flight Breakup (If Applicable)
4. Contingency Routing
  - a. Hung/Unexpended Ordnance (If Applicable)
  - b. Weapons/Aircraft Malfunction (If Applicable)
5. Pattern and Landing
6. Landing/De-Arm

## Attachment 1A

**SPECIAL SUBJECTS BRIEFING GUIDE**

1. Instructor Responsibilities
2. Chase Procedures
3. IFF Procedures
4. Visual Search Responsibilities/Midair Collision Avoidance/Flight Path Deconfliction
5. Dissimilar Formations
6. Terrain Avoidance
  - a. Departure/En Route/Recovery
  - b. Use of Radar Altimeters
7. Bird Strike Procedures/Use of Visor(s)
8. Hazards Associated With Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)
9. G-Awareness
  - a. Turn/G-Suit Connection/G-tolerance
  - b. Use of L-1 Anti-G Straining Maneuver (AGSM)
10. Visual Illusions/Perceptions
- \*11. Spatial Disorientation/Unusual Attitudes/G Excess Illusion
12. Lost Wingman
13. Radio Inoperative
14. SARCAP
15. Recall Procedures
16. SIIs

**Specific Mission Briefing (Attachments)**

2. Instrument/Navigation Briefing Guide
3. Air Refueling Briefing Guide
4. (Dissimilar) Air Combat Training Briefing Guide
5. Escort Mission Briefing Guide
6. Low Level Navigation/Low Altitude Tactical Navigation Briefing Guide
7. Air-to-Surface Weapons Employment Range Mission Briefing Guide
  - a. Range Mission
  - b. Surface Attack Tactics
  - c. Close Air Support/Interdiction/Armed Recce/FAC/JAAT
  - d. Combat SAR Briefing Guide
  - e. Air Strike Control Briefing Guide
8. Night Vision Goggles (NVG) Briefing Guide
9. Mission De-Briefing Guide
10. NVG Cockpit Set-Up
- \*11. (PACAF) NVG Cockpit Set-Up Checklist and Degraded Cockpit Training Limitations

**Attachment 2**  
**INSTRUMENT/NAVIGATION BRIEFING GUIDE**

**CLIMB**

1. Instrument Departure
  - a. Power Setting/Airspeed
  - b. Trail Departure (If Applicable)
  - c. Routing (SID, Radar Vectors, etc.)
2. Level Off
3. Formation

**CRUISE**

1. En route
2. Cruise Data
3. Nav Aids
4. Fuel Awareness/Ops Checks

**AREA**

1. Airwork
  - a. Airspace Restrictions
  - b. Area Orientation
  - c. Instructor Responsibilities (If Applicable)
  - d. Maneuvers/G-Awareness

**APPROACHES**

1. Frequencies
2. Holding
3. Penetration
4. Missed Approach/Climb out

**SPECIAL SUBJECTS**

1. Alternate Mission
2. Emergency/Alternate Airfields
3. Spatial Disorientation
4. Unusual Attitudes
5. Hazards Associated With Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)
6. Low Altitude Ejection
7. Lost Wingman
8. Aircraft Lighting Considerations

**Attachment 3**  
**AIR REFUELING BRIEFING GUIDE**

**GENERAL**

1. Tanker Call Sign(s), Receiver Assignments
2. Refueling Track(s) (Altitude and Airspeed)
3. Radio Frequencies
4. ARIPs, ARCPs, ARCTs

**BUDDY PROCEDURES**

1. Departure
2. Joinup

**ENROUTE**

1. Route of Flight
2. Formation
3. Ops Checks

**RENDEZVOUS**

1. Type Rendezvous
2. Holding Procedures/Formation
3. Ground Radar Assistance
4. Tanker Identification — A/A TACAN/Ground Radar/ADF/Visual
5. Wingman/Deputy Lead Responsibilities
6. Receiver Formation/Joinup Procedures
7. Rendezvous Overrun

**REFUELING**

1. Checklist Procedures
2. Radio Calls
3. Refueling Order
4. Techniques
5. Radio Silent Procedures (EMCON/Visual Signals)
6. Fuel Off-Load
7. Abort Points/Abort Bases
8. Drop-Off Procedures
9. Wake Turbulence

**REJOIN AND EXIT**

1. Formation
2. Clearance

**EMERGENCY PROCEDURES**

1. Breakaway Procedures
2. Systems Malfunctions
3. Damaged Receptacle

**IMC/NIGHT CONSIDERATIONS (If Applicable)**

1. Lost Wingman Procedures
  - a. Enroute
  - b. On the Tanker
2. Aircraft Lighting

**SPECIAL SUBJECTS**

1. Alternate Mission
2. Spatial Disorientation
3. Hazards Associated With Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)

**Attachment 4**  
**(DISSIMILAR) AIR COMBAT TRAINING (ACBT) BRIEFING GUIDE**

**GENERAL**

1. Call Signs
2. Number and Type Aircraft
3. Dissimilar Formation (If Applicable)
  - a. Formation References
  - b. Inflight Visual Signals
4. Debriefing (Time/Place)
5. G-Awareness/Tolerance/Warm-up
6. Area Information
  - a. Controlling Agency
  - b. Airspace Limits/Restrictions
  - c. Frequencies
  - d. Squawks
  - e. Block Altitudes/Minimum Altitudes

**TACTICAL**

1. Scenario
  - a. Type Threat Simulated/Tactics Limitations
  - b. Safe Areas/FEBA
  - c. Ingress/Egress Routing/Target Locations
2. LOWAT (If Applicable)
  - a. Minimum Altitudes
  - b. Maneuvering Limitations
3. BFM
  - a. Setups
  - b. Offensive
  - c. Defensive
4. Flight/Element Tactics
  - a. Tactics/Mutual Support
  - b. Formation/Look out Responsibilities
  - c. Roles and Responsibilities
    - (1) Engaged
    - (2) Supporting
  - d. Clearance for Wingman to Engage
  - e. Radio Usage
  - f. Egress/Separate/Rejoin
  - g. Termination
5. Weapons Employment
  - a. Weapons System/RWR/ECM/IFF Checks
  - b. Simulated Ordnance (Type/Quantity)
  - c. Shot Criteria/Air-to-Air Weapons Switchology
  - d. Kill Criteria/Removal

**SPECIFIC MISSION CONSIDERATIONS**

1. Air to Air Training Rules
2. Midair Collision Avoidance/Flight Path Deconfliction (With/Without Visual)
3. Maneuvering Limitations
  - a. AOA/Airspeed and G
  - b. Recognition/Prevention/Recovery from Out of Control
  - c. Heavy Gross Weight Effect on Maneuvering
  - d. Limitations
    - (1) Aircraft
    - (2) Ordnance
  - e. Asymmetrical Configuration/Thrust
  - f. Adverse Yaw/Accelerated Stalls

- g. Stalls/Departures
  - (1) Engine Stall Susceptibility
  - (2) Flight Control Effectiveness
  - (3) Use of AOA/Aural Tones
- h. A/OA-10 vs A/OA-10 unique considerations
- i. A/OA-10 vs High Speed Fighter
- j. Energy/Thrust Limitations

**SPECIAL SUBJECTS**

1. Emergencies/Escort/Dissimilar Formation Recovery (If Applicable)
2. Additional Considerations
  - a. Film/VTR
  - b. Tape Recorders
  - c. Air-to-Air TACAN
  - d. Codewords
  - e. Environmental Considerations (Sun angle, etc.)
3. Hazards Associated With Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)
4. Alternate Mission



**Attachment 5**  
**ESCORT MISSION BRIEFING GUIDE**

**ENROUTE TO RENDEZVOUS/POST-MISSION NAVIGATION**

1. Formation
2. Route of Flight/Applicable Restrictions
3. Control Agency Callsign/Frequency

**RENDEZVOUS**

- \*1. Protected Force Callsign/Common Frequency
- \*2. Number/Type Aircraft
- \*3. Rendezvous Point/Time
4. Altitude
5. Airspeed

**ESCORT PROCEDURES**

1. Type Formation
- \*2. Tactics/Mutual Support
- \*3. Escort Route/Airspeed
4. Weapons Considerations
5. ECM/RWR

**TRAINING RULES**

**Attachment 6**  
**LOW LEVEL NAVIGATION/LOW ALTITUDE**  
**TACTICAL NAVIGATION (LATN) BRIEFING GUIDE**

**GENERAL**

1. Route/Clearance/Restrictions
2. Flight Responsibilities
  - a. Navigation
  - b. Visual Search Responsibilities
  - c. Radio Procedures
3. Entry/Spacing/Holding

**ROUTE PROCEDURES**

1. Airspace Restrictions
2. Fence Checks
3. Tactical Formation/Turns
4. G-Awareness/Warm-up
5. Low Level Navigation
  - a. Map Preparation/Pilotage/Dead Reckoning
  - b. Use of Nav Aids/INS
  - c. Visual Search Techniques
  - d. Updates
  - e. Time/Fuel Control
  - f. Use of Terrain/Wingman Considerations
  - g. Leg Altitudes/Obstacles (MSL/AGL)
  - h. Turn Point Acquisition
6. Threat Reactions
  - a. RWR/ECM/ALE-40
  - b. Engagement Criteria
  - c. LOWAT (If Applicable)
  - d. Flight Path Deconfliction (With/Without Visual)

**SPECIAL SUBJECTS**

1. Fuel Awareness/Ops Checks
2. Two/Three Ship Options
3. Low Level Safety Procedures
  - a. Terrain Avoidance
  - b. Time to Ground Impact
    - (1) Wings Level
    - (2) Over Bank/Under G
  - c. Aircraft and Flight Maneuvering Parameters
  - d. Knock-It-Off Criteria/Response
  - e. Low Level Emergencies/Malfunctions
  - f. Route Abort Procedures (RAA)
  - g. Hazards Associated With Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)
    - h. Task Saturation/Prioritization
    - i. Visual Illusions/Perceptions
4. Alternate Mission/Routing
5. Emergency/Alternate Airfields
6. Special Operating Instructions (If Applicable)

**WEAPONS EMPLOYMENT:** Refer to Appropriate Air-to-Surface Employment Briefing Guide

**Attachment 7**  
**AIR-TO-SURFACE WEAPONS EMPLOYMENT BRIEFING GUIDES**

Attachment 7A  
**RANGE MISSION BRIEFING GUIDE**

**ENROUTE—G-AWARENESS/WARM-UP**

**RANGE INFORMATION**

1. Target/Range Description
2. Restrictions
3. Range Entry/Holding
4. Radio Procedures
5. Formation
6. Sequence of Events
7. Pattern Procedures

**EMPLOYMENT PROCEDURES/TECHNIQUES**

1. Switch Positions
  - a. Arming
  - b. Displays
  - c. Use of INS/HUD/LASTE
2. Pop-up Delivery
  - a. Entry Airspeed/Altitude
  - b. Pop Point/Pull-up Angle/Power Setting
  - c. Target Acquisition
  - d. Pull Down/Apex Altitudes
  - e. Pattern Corrections
3. Roll-In
  - a. Position
  - b. Techniques (Pitch/Bank/Power)
  - c. Roll-out/Wind Effect
4. Final
  - a. Aim-Off Distance/IPP
  - b. Dive Angle
  - c. Airspeed
  - d. HUD Depiction
  - e. Sight Picture/Corrections/Aim-Point
  - f. Release Parameters
  - g. Release Indications
  - h. Recovery Procedures

**NIGHT PROCEDURES (If Applicable)**

1. Aircraft Lighting
2. Radio Calls
3. Target ID/Range Lighting
4. Night Spacing Techniques
5. Instrument Cross-check/Disorientation
6. Flare Pattern
  - a. Flare Release Points and Interval
  - b. Wind Effect/Offset
  - c. Dud Flare Procedures
  - d. Switching Aircraft Patterns

**OVER WATER RANGE OPERATIONS**

1. Employment Techniques
  - a. Depth Perception/Reduced Visual Cues
  - b. Distance/Altitude Estimation
  - c. Pop-Up Positioning
    - (1) Timing

(2) Visual/Aircraft References to Establish Pull-up Point

2. Special Considerations
  - a. Adjusted Minimum Altitudes
  - b. Training Rules/Special Operating Procedures

**RANGE DEPARTURE/RECOVERY**

1. Armament Safety Checks
2. Rejoin
3. Battle Damage/Bomb Check
4. Hung Ordnance
5. Inadvertent Release
6. Gun Unsafe/Jam

**SPECIAL SUBJECTS**

1. Error Analysis
2. Air to Surface Training Rules/Special Operating Instructions
3. Fouls
4. Minimum Altitudes
5. Maneuvering Limitations
  - a. Aircraft
  - b. Stores (Carriage/Release)
6. Target Fixation/Channelized Attention
7. Time to Ground Impact
  - a. Wings Level
  - b. Over Bank/Under G
8. Hazards Associated With Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)
9. Alternate Mission

Attachment 7B

**SURFACE ATTACK TACTICS BRIEFING GUIDE**

**GENERAL MISSION DATA**

1. Intelligence/Threat Scenario
2. Low Level (See Low Level Briefing Guide)
3. Fence Checks
4. G-Awareness/Warm-up
5. Operating Area Entry/Description/ Boundaries
6. Target Area/Clearing Pass
  - a. Location/Description/Elevation/TOT
  - b. Visual Cues in the Target Area
  - c. Target Area Weather
    - (1) Ceiling/Visibility
    - (2) Winds/Altimeter
    - (3) Sun Angle/Shadows
7. Threat Array
  - a. Type/Capabilities
  - b. Locations
  - c. Countermeasures
    - (1) Chaff/Flare
    - (2) Terrain Masking
    - (3) Radio Silent Procedures
    - (4) Authentication/Comm-Jamming/Chattermark Procedures
  - d. Threat Reactions
    - (1) LOWAT (If Applicable)

**DELIVERY**

1. Tactics
  - a. Overview
  - b. Ingress
    - (1) Formation
    - (2) Speed/Altitude
  - c. Weapons Delivery
    - (1) Type Delivery
    - (2) Switchology
    - (3) Attack Parameters
      - (a) Action Point/Pop Point
      - (b) Altitudes (Pull-Down/Apex/Release/Minimum)
    - (4) Visual Lookout/Mutual Support Responsibilities
  - d. Egress
    - (1) Recovery/Return to Low Altitude
    - (2) Loss of Mutual Support/Rendezvous Point

**NIGHT PROCEDURES (If Applicable)**

1. Aircraft Lighting
2. Radio Calls
3. Target ID/Range Lighting
- \*4. Night Spacing Techniques/Minimum Altitudes
5. Instrument Cross-check/Disorientation
6. Flare Pattern
  - a. Flare Release Points and Interval
  - b. Wind Effect/Offset
  - c. Dud Flare Procedures
  - d. Switching Aircraft Patterns
7. Rejoin/Range Departure
8. Battle Damage/Bomb Check

## 9. Mission Reporting (BDA/Inflight Report)

**CONTINGENCIES**

1. Two/Three Ship Options
2. Tactical Lead Changes
3. Air-to-Air TACAN
4. Codewords
5. Weather Backup Deliveries
6. Degraded Systems
7. Reattack
8. Asymmetric Considerations
9. Jettison Procedures/Parameters
10. Hung/Unexpended Ordnance Procedures
11. Wounded Bird/Escort Procedures

**SPECIAL SUBJECTS**

1. Air-to-Surface Training Rules/Special Operating Instructions
2. LOWAT Training Rules (If Applicable)
3. Maritime Training Rules (If Applicable)
4. Night Procedures (If Applicable)
5. Hazards Associated With Human Factors (i.e., Channelized Attention, Task Saturation/ Prioritization, and Complacency)
6. Alternate Mission

## Attachment 7C

**CLOSE AIR SUPPORT/INTERDICTION/ARMED RECCE**  
**FAC/JAAT BRIEFING GUIDE****GENERAL INFORMATION**

1. Intelligence/Threat Scenario
2. Low Level (See Low Level Briefing Guide)
3. Ordnance/Weapons Data
  - a. Type/Fuzing
  - b. Weapon Settings
  - c. Live Ordnance Procedures/Minimum Altitudes
    - (1) Safe Escape/Safe Separation
    - (2) Fuse Arming/Frag Avoidance
  - d. Laser Operations
4. En route Formation(s)/Look Out Responsibilities/LOWAT (If Applicable)
5. Fence Checks
6. G-Awareness/Warm-up
7. Control Agency
  - a. Call Sign
  - b. Frequencies

**ARMED RECCE PROCEDURES**

1. Recce Route/Altitudes
2. Formations
3. Target Types
4. Engagement Criteria
5. Attack Tactics—Refer to Weapons Delivery

**JAAT PROCEDURES**

1. Controlling Agencies
  - a. Air Battle Captain (ABC)
  - b. HeloFAC
2. Coordination
  - a. AVN CDR/HeloFAC-to-Fighter Brief
  - b. Unmask Call/Code Words
  - c. Airspace Restrictions
    - (1) Helicopter Altitude Block
    - (2) Fighter Altitude Block
    - (3) Artillery Corridor/Separation

**FAC PROCEDURES**

1. Call Sign/Mission Number
2. Primary/Alternate Target Area
  - a. Description
  - b. Frequencies
3. Rendezvous Point/TOT/Authentication Procedures
4. Fighter—FAC Briefing
  - a. Mission Number
  - b. Ordnance (Simulated/Actual)
  - c. Playtime
5. FAC—Fighter Briefing
  - a. Friendly Position
  - b. Restrictions
6. Target Description
  - a. Location/Elevation
  - b. Highest Obstacle Within 5 NM
  - c. Description
  - d. Positions of Enemy/Friendly Troops
7. Attack Tactics

- a. Type Attack/Attack Restrictions
- b. Direction of Attack Recovery
- c. Ordnance Delivery Procedures (Refer to Weapons Delivery)

**WEAPONS DELIVERY**

1. Tactics
  - a. Type Delivery
  - b. Switchology
  - c. Attack Parameters
    - (1) Action Point/Pop Point
    - (2) Altitudes (Pull-Down/Apex/Release/Minimum)
  - d. Visual Lookout/Mutual Support Responsibilities
  - e. Egress
    - (1) Recovery/Return to Low Altitude
    - (2) Loss of Mutual Support/Rendezvous Point
2. Battle Damage/Bomb Check
3. Mission Reporting (BDA/Inflight Report)

**CONTINGENCIES**

1. Two/Three Ship Options
2. Tactical Lead Changes
3. Air-to-Air TACAN
4. Codewords
5. Weather Backup Deliveries
6. Degraded Systems
7. Reattack
8. Asymmetric Considerations
9. Jettison Procedures/Parameters
10. Hung/Unexpended Ordnance Procedures
11. Wounded Bird/Escort Procedures

**SPECIAL SUBJECTS**

1. Air-to-Surface Training Rules
2. LOWAT Training Rules (If Applicable)
3. Night Procedures (If Applicable)
4. Hazards Associated With Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)
5. Alternate Mission



Attachment 7D

**COMBAT SAR BRIEFING GUIDE**

**COMBAT SAR PROCEDURES**

1. Enroute to SAR Area
  - a. Formation
  - b. Route
  - c. Cruise Data
  - d. Control Agency(s) Call Sign/Frequencies
  - e. Holding Points And Procedures
  - f. Safe Areas
2. Electronic/Visual Search
  - a. Minimum Altitudes/Airspeeds
  - b. Patterns and Wingman Position/Responsibilities
  - c. Radio Procedures
  - d. Look-Out Doctrine
  - e. Low Altitude Hazards
  - f. IP Selection and Ingress Route
  - g. Survivor Briefing/Authentication
3. Helicopter Rendezvous/Escort
  - a. Helicopter Call Sign
  - b. Altitude/Airspeed
  - c. Helicopter Briefing
  - d. Type Formation/Patterns for Escort
  - e. Tactics
  - f. ECM/RWR
  - g. Suppression
  - h. Pick-Up Techniques
  - i. Hover Cover Patterns
  - j. Egress Route/Altitude
4. FAC/SCAR Procedures
5. Ordnance Considerations (Refer to Weapons Delivery)
6. Ops Checks
7. Fuel Considerations (Tanker Availability)
8. After Pick-up Procedures
  - a. Target Area Egress, Rejoin, Ordnance Checks and Return Navigation
  - b. Recovery With Weapons Malfunctions.

## Attachment 7E

**AIR STRIKE CONTROL BRIEFING GUIDE****INTELLIGENCE**

1. Controlling Agencies
2. Enemy Positions/Defenses
3. Friendly Positions
  - a. Call Sign/Ground Commander/Ground FAC
  - b. Frequencies
  - c. Minimum Altitudes
4. Threat Information
5. E&E/SAFE Areas
6. SAR
7. Authentication/Code Words

**LOCAL OPERATING PROCEDURES****RANGE/MOA DATA**

1. Frequencies
2. Boundaries
3. Entry/Exit
4. Restrictions
5. G-Awareness/Warm-up

**FAC STRIKE DATA**

1. Fighters/ATO Information
  - a. Call Sign/Mission Number/Frequencies
  - b. Type Ordnance
  - c. Contact Point/TOT
  - d. Restrictions
2. Sequence of Delivery/Fuzing
3. FAC Tactics
  - a. Alternate Plan for Weather
  - b. Late/No Fighters
  - c. Worsening Ground Situation
4. Target Description
  - a. Location / Elevation
  - b. Highest Obstacle Within 5 NM
  - c. Description
  - d. Positions of Enemy / Friendly Troops
5. Target Marking
  - a. Switch Procedures
  - b. Delivery Data
  - c. Minimum Delivery Altitudes
  - d. Footprint Data
  - e. Ground Marking Techniques
6. Clearance Procedures
  - a. Cold/Hot/Dry
  - b. Ground Commander/FFAC
7. Mandatory Calls
  - a. Clearance
  - b. Armament Safety Check/Fuel
8. Minimum Airspeeds
9. Battle Damage Check
10. BDA

**FAC TO ASOC BRIEF/DEBRIEF****CONTINGENCIES**

1. Range/MOA Emergency Procedures/ NORDDO
2. Hung/Unexpended Ordnance Procedures

**FAC-TO-FIGHTER PRE-MISSION BRIEF  
AIR-TO-SURFACE TRAINING RULES**

**\*Attachment 8**  
**NVG CONSIDERATIONS**

**NOTE:** This guide is meant to highlight general NVG considerations, and provides a reference for a basic NVG briefing. All applicable NVG considerations should be incorporated into the specific briefing for the mission being flown.

**WEATHER/ILLUMINATION**

1. Civil/nautical twilight
2. Moon rise/set times/ phase/elevation/azimuth
3. Ceiling/visibility
- \*4. LUX/EO TDA
5. Obscurants to visibility

**NVG PREFLIGHT**

1. Check adjustments/helmet fit and security
2. Batteries
3. Resolution/focus (eye lane)
4. NVG compatible flashlight

**COCKPIT PREFLIGHT**

1. Cockpit setup
2. Cockpit lighting (leaks)/mirrors up
3. Cockpit FAM
4. Check focus, stow for taxi

**BEFORE TAKEOFF**

1. Don NVGs/check and adjust/disconnect
2. Stow for takeoff

**AIRBORNE**

1. Exterior lights
2. Scan pattern
  - a. Forward scan
  - b. Narrow field of view
  - c. Peripheral vision
  - d. Scan techniques
3. Joinup and enroute altitude/airspeed
  - a. Rejoin/closure
  - b. Air -Air TACAN

**MISSION**

1. Route study/scene interpretation
  - a. NVG predictions/ALBIDO
  - b. Terrain/shadowing/visual illusions
  - c. City/cultural lighting
    - (1) Direction/Orientation of lighting
2. Aggressive formation maneuvering
3. Radar altimeter usage
4. Map reading

**TARGET AREA**

1. RV/Holding procedures (NVG differences)
2. Target study/acquisition (NVG predictions)
3. Deliveries/Pattern procedures
  - a. Minimum altitudes
  - b. Flight member responsibilities
  - c. Moth effect/Deconfliction
4. Laser/IR Pointer Operations
5. Threat ID and reaction
6. Egress

**NVG SAFETY**

1. Lost sight—NVGs
2. Lost wingman—NVGs

3. Depth perception
4. Visual illusions
5. NVG failure
6. Battery failure
7. Overconfidence in NVG Capabilities
8. Transition to Instruments
9. Correct lighting of primary/secondary flight instruments
10. Disorientation/misorientation/vertigo
11. Target fixation
12. Lack of dive information
13. Fatigue
14. Aircraft emergency
15. Ejection — GOGGLES - OFF

**Attachment 9**  
**MISSION DEBRIEFING GUIDE**

1. Ground Procedures
2. Takeoff, Joinup, Departure
3. En route Procedures
4. Mission Accomplishment/Analysis
  - a. Mission Reconstruction
  - b. Mission Support (FAC, GCI, Helicopters, etc.)
  - c. VTR/Film Assessment (If Applicable)
  - d. Learning Objectives Achieved
  - e. Lessons Learned
  - f. Anti-G Straining Maneuver Effectiveness
  - g. Recommendations for Improvement
5. Recovery/Landing/After Landing
6. General
  - a. Radio Procedures
  - b. Flight Discipline/Effectiveness
  - c. General Areas for Improvement
7. Comments/Questions

**\*Attachment 10**  
**NVG COCKPIT SET-UP**

- A. Units will only use MAJCOM approved NVG compatible (Glendale Green type) filter covers for non-NVIS versions of the following components: ADI, HSI, altimeter, airspeed indicator, VVI, or standby ADI. If a MAJCOM approved solution is not available, then pilots will turn off the affected rheostat and follow the chem stick procedures below.
- B. For any components other than those listed in paragraph 3.20.9.1 which are non-NVIS, units/pilots may turn the component's lights off, or cover with Glendale Green, or cover with electrical tape, or have unit maintenance turn them off at the lighting balance box, as appropriate. (It is preferable to turn off the RFI and fuel gauge lighting at the balance box to allow the internal green illumination of the standby ADI to be used. If the RFI cannot be completely turned off, it should be taped over due to its position next to the standby ADI. If this is not practical, then the auxiliary instrument rheostat should be turned off.) Follow the applicable chem stick procedures below for each rheostat that is turned off due to incompatible light sources.
1. **(PACAF) Reference Attachment 11 for NVG cockpit setup procedures.**
  2. **(PACAF) Unit maintenance will isolate non-NVIS modified VHF-AM/FM and ECM Control heads by turning them off at the lighting balance box. (Maintenance will annotate this in the aircraft 781s). Pilots will use NVG compatible finger lights and/or NVIS modified flood lights to view these gauges. Pilots on a non-NVG night flight will use cockpit flood lights to illuminate these gauges.**
  3. **(PACAF) If maintenance is unable to turn off the VHF-AM/FM and ECM control head lighting at the lighting balance box, pilots will turn off the cockpit console rheostat and comply with the procedures in paragraph C below.**
- C. The following nine standardized chem stick locations have been developed and will be referred to by position number:
1. 6" chem stick under right side of the glare shield.
  2. 6" chem stick under left side of the glare shield.
  3. 6" chem stick under center of the glare shield.
  4. 4" chem stick mounted vertically on the right side of the HSI.
  5. 4" chem stick mounted vertically on the left side of the HSI.
  6. 1.5" chem stick mounted vertically on the 9 o'clock position of the airspeed indicator. (pilot option) **(PACAF) Mandatory item.**
  7. 1.5" chem stick mounted vertically on the 9 o'clock position of the standby ADI. (pilot option) **(PACAF) Mandatory item.**
  8. 6" chem stick under the right canopy rail.
  9. 6" chem stick under the left canopy rail.
- D. Notes:
1. Chem sticks placed under the glare shield will be mounted at the front edge of the glare shield to minimize shadowing on the instruments below, will be placed in plastic holders adjusted to the fully open position, and will be angled to point the illumination toward the instrument panel.
  2. 4" chem sticks placed vertically on each side of the HSI will be placed in plastic holders and will be angled to point the illumination toward the HSI, the left engine instruments, or both as required. 4" chem stick plastic holders are made by cutting 6" plastic holders, taping at both ends, and will be adjusted to the half open position. Instead of cutting 6" plastic holders, units may use black irrigation tubing cut to fit the length of the chem stick with a 3/16th inch by 2.25 inch window cut into the tube for illumination.
  3. When using positions 6 or 7, pilots must use caution to ensure they do not obstruct a portion of the instrument's markings.
  4. Pilots should finely adjust the position of the chem sticks to maximize illumination and minimize glare.
- E. For every rheostat (flight instrument, auxiliary instrument, engine instrument, or console) that is turned off, the following chem stick configurations will be used:
1. Flight instrument rheostat: positions 1, 2, 3, 4, and 5. Position 6 may be used at pilot discretion **(PACAF) Mandatory item.**
  2. Auxiliary instrument rheostat: positions 1, 2, and 3. Position 7 may be used at pilot discretion **(PACAF) Mandatory item.**
  3. Engine instrument rheostat: position 1 and 4 where the 4" chem stick plastic holder at position 4 is angled to point the illumination toward the left engine instruments. If both the flight instrument and engine instrument rheostats are turned off, then the 4" chem stick plastic holder at position 4 will be angled to point the illumination toward the HSI, and will be modified with an additional 3/16th inch by 2.25 inch window on the right side to allow illumination toward the left engine instruments.

4. Console rheostat: pilots will use the floodlights in the dim or greater position.
5. Console rheostat with inoperative floodlights: pilots will place chem sticks in positions 8 and 9.
- F. Unmodified aircraft. For aircraft that have not been modified, pilots will place chem sticks in all nine positions IAW paragraphs 4, 5, and 6 above. The rest of the cockpit setup will continue to be IAW the unmodified cockpit checklist in appendix B of the Jun 94 A/OA-10 NVG transition manual. Training will be limited to cadre IPs on CAT I sorties. **(PACAF) Pilots will use the NVG cockpit setup checklist at Attachment 11.**
- G. Units and/or pilots may add additional chem sticks to the configurations above. However, they must ensure they do not place chem sticks in positions that block critical information.



**\*(PACAF) Attachment 11  
NVG COCKPIT SET-UP CHECKLIST AND  
DEGRADED COCKPIT TRAINING LIMITATIONS**

**NOTE:** Use the following procedures if cockpit lighting is not NVIS compatible. This checklist may be arranged to suit unit needs; however, it contains the minimum items and information required on locally produced checklists.

**A. INSTRUMENTS / MASTER CAUTION (See Notes 1 and 2)**

1. AOA indicator lights - Blacken with electrical tape
2. Fuel Quantity Indicator - Glendale Green (3.5" x 3.5")
3. Flap Position Indicator - Glendale Green (2.25" x 2.25")
4. Master Caution light - Glendale Green (1.5" x 0.5") - DOUBLE

**B. RADIO / IFF / NAV EQUIPMENT (See Note 1)**

1. IFF Test and Reply lights - Blacken with electrical tape
2. Marker Beacon light - Blacken with electrical tape
3. Nav Course Select Panel buttons - Glendale Green (11/16" x 11/16")
4. Radio Call Number - Blacken with electrical tape
5. TACAN Test light - Blacken with electrical tape
6. UHF and FM homing lights - Blacken with electrical tape
7. UHF Remote Frequency Indicator - Glendale Green (1" x 3")
8. VHF-AM/FM control head - Off at balance box OR Console Rheostat OFF

**C. WEAPONS / ECM (See Note 1)**

1. AIM-9 Ready light - Blacken with electrical tape
2. BIT light on TVM panel - Blacken with electrical tape
3. Chaff/Flare ready lights - Blacken with electrical tape
4. ECM buttons - Glendale Green (0.75" x 0.75")
5. ECM control head - Off at balance box OR Console Rheostat OFF
5. Gun Ready light - Glendale Green (1.5" x 0.5")
6. HUD malfunction light - Blacken with electrical tape
7. Pave Penny Panel buttons - Glendale Green (11/16" x 11/16") - DOUBLE
8. RWR buttons - Glendale Green (11/16" x 11/16")
9. VTR tape display lights and counter - Blacken with electrical tape
10. Weapons Station Select buttons - Glendale Green (11/16" x 11/16")

**NOTE 1:** If blackened with tape or covered with Glendale Green or not NVIS modified, turn off or dim the following to the lowest practical setting as appropriate:

1. ACP, Pave Penny panel, HUD control panel, TVM control panel (ACP Rheostat - OFF)
2. Accelerometer/compass lights (OFF)
3. AOA/Refueling Indexer lights
4. ECM buttons
5. IFF Test and Reply lights
6. Modified Map lights (OFF)
7. Weapons Station Select lights
8. RWR buttons
9. Signal lights - DIM

**NOTE 2:** If any Warning Annunciator panel lights are not NVIS modified, cover panel with a 5" x 12" black velvet strip folded in half and held in place by hook velcro.

**D. Pre-Takeoff Lighting Compatibility Checks**

1. NVGs - Focus to infinity.
2. With the NVGS on, check the cockpit for any non-compatible light.
3. Rheostat(s) - OFF, for any lighting that can not be covered, taped, or dimmed IAW procedures above.
4. If Rheostat(s) - OFF, follow chem stick placement procedures and training limitations below.

**E. Chem stick Placement Procedures**

If Rheostat Turned OFF	Then Chem Sticks Required in Position #
Primary Flight Instruments	1, 2, 3, 4, 5 & 6
Aux Instruments	1, 2, 3, 4 & 7

Engine Instruments	1 & 4 (Double opening holder)
Console (use floodlights in DIM or greater)	8 & 9 (if floodlights inop or unmodified)
ACP	1,2, & 3 (use finger/flood lights as needed)

1. 6" Under right side of glare shield (See Note 3)
2. 6" Under left side of glare shield (See Note 3)
3. 6" Under Fire Pull T- handles (See Note 3)
4. 4" Vertically on right side of HSI pointed at HSI
5. 4" Vertically on left side of HSI pointed at HSI
6. 1.5" Vertically on left side of Airspeed Indicator (See Note 3)
7. 1.5" Vertically on left side of STBY ADI (See Note 3)
8. 6" Under right canopy rail
9. 6" Under left canopy rail

**NOTE 3:** Positions 1, 2 & 3 will be fully open, mounted at the front edge of the glare shield, and adjusted to maximize illumination and minimize shadowing. Do not block instrument markings when using positions 6 & 7.

#### F. DEGRADED COCKPIT TRAINING LIMITATIONS

**1. Cat I and II for all qualified pilots** - If the following are NVIS modified or equipped with NVIS instrument filter covers (if applicable).

ADI**	ACP
Altimeter**	Engine Instruments (APU Instruments N/R)
Airspeed Indicator**	Hydraulic Gauges
HSI**	HUD Control Panel
Fuel Gage**	OSP (LASTE)
RFI**	Standby ADI
VVI**	

\*\*Instruments approved for use with NVIS filter cover

**2. Cat I and Cat II - Unit Designated Cadre, Cat I - all other pilots** - If any of the above instruments are not NVIS compatible or do not have approved NVIS filter covers installed (as required).

**3. Cat I - Unit Designated Cadre** - In unmodified aircraft