

*Flying Operations*

***AIRCREW OPERATIONAL PROCEDURES--F-15/F-15E***

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**COMPLIANCE WITH THIS INSTRUCTION IS MANDATORY**

This instruction, with its complementary Chapter 8, Local Operating Procedures, and Chapter 9, MAJCOM Operating Procedures, prescribes standard operational and weapons employment procedures to be used by all tactical aircrews operating USAF F-15 and F-15E aircraft. Det 1, 57 Wing may deviate from the contents of this instruction as outlined in individually approved test plans required for Follow On Test and Evaluation (FOT&E) purposes. File a copy of all approved waivers with this instruction. This instruction supersedes all previous editions of MCR 55-115.

**NOTE:** This publication incorporates Chapter 9 using the paragraph supplementation method. *Supplemental material is highlighted in BOLD italics and prefaced with (ACC/ANG).*

**\*SUMMARY OF REVISIONS**

Deletes requirement to RTB following an over-G if the conditions below are met (para 7.4.3). Implements updated policy that will be incorporated in the forthcoming AFI 11-2F15V3 (para 7.4.4.2). An asterisk (\*) indicates a change (other than grammatical) from the previous edition of this publication.

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### ATTACHMENTS

1. General Briefing Guide
2. Special Subject Briefing Guide
3. Advanced Handling/Instrument Briefing Guide
4. Air Refueling Briefing Guide
5. Air Combat Training (ACBT)/Intercept Briefing Guide
6. Escort Mission Briefing Guide
7. Aerial Gunnery Tow Coordination Briefing Guide
8. Aerial Gunnery Briefing Guide
9. Low Level Navigation Briefing Guide
10. Air-to-Surface Weapons Employment Briefing Guide - Range Mission
11. Air-to-Surface Weapons Employment Briefing Guide - Surface Attack Tactics
12. Air-to-Surface Weapons Employment Briefing Guide - Interdiction/Armed Recce/Close Air Support
13. Alert Briefing Guide
14. Crew Coordination/Passenger/Ground Crew Briefing Guide

15. Mission Debriefing Guide
16. Subject - Paragraph Index

## Chapter 1

### INTRODUCTION

#### 1.1. General.

1.1.1. Scope. This instruction outlines the procedures applicable to the safe operation of the F-15 and F-15E. With the complementary references, this instruction prescribes standard operational procedures for all USAF F-15/F-15E aircrews.

1.1.2. Aircrew Responsibility. This instruction, in conjunction with other governing directives, prescribes procedures for operating F-15/F-15E aircraft under most circumstances. It is not a substitute for sound judgment. Procedures not specifically addressed may be accomplished if they enhance safe and effective mission accomplishment.

1.1.3. Deviations. Deviations from these procedures require specific approval of the MAJCOM/DO (NGB/XO, 19AF/DO) unless an urgent requirement or an aircraft emergency dictate otherwise. In that case, the pilot in command will take the appropriate action to safely recover the aircraft.

1.1.4. References. The primary references for F-15/F-15E operations are T.O.s 1F-15A-1, 1F-15E-1, 1F-15C-34, 1F-15E-34, MCMs 3-1 and 3-3, AFI 11-214, and this instruction. Training units may develop phase manuals from the procedures contained in these documents. Phase manuals may expand on basic procedures but in no case will they be less restrictive. Operational units may use these phase manuals.

**1.2. Waivers.** Forward waiver requests through appropriate channels to the applicable MAJCOM/DO (NGB/XO, 19AF/DO) for approval. Approved waivers are issued for a maximum of one year from the effective date. Provide information copies of approved waivers to the other instruction OPRs.

#### 1.3. Instruction Changes.

1.3.1. Submit recommendations for change to this instruction on an AF Form 847, Recommendation for Change of Publication (Flight Publication) to the parent MAJCOM. Forward approved recommendations to the MCOPR.

1.3.2. The “ \* ” symbol indicates a change (other than grammatical) from the previous edition of this instruction.

**1.4. Distribution.** Each aircrew member is authorized a copy of this instruction.

## Chapter 2

### MISSION PLANNING

**2.1. Responsibilities.** The responsibility for mission planning is shared jointly by all flight members and the operations and intelligence functions of fighter organizations.

#### **2.2. General Procedures.**

2.2.1. Accomplish sufficient flight planning to ensure safe mission accomplishment to include fuel requirements, map preparation, and takeoff/landing data.

#### **2.3. Map/Chart Preparation.**

2.3.1. Local Area Maps. A local area map is not required if the unit aircrew aid includes jettison areas, divert information, controlled bailout areas, and provides a local area map of sufficient detail to remain within assigned training areas.

2.3.2. Charts. FLIP en route charts may be used instead of maps on navigational flights within areas that are adequately covered by these charts.

##### 2.3.3. Low Altitude Maps.

- On low altitude flights, each aircraft in the flight will contain a minimum of one CHUMed map of the low altitude route/operating area. The map will be of a scale and quality that terrain features, hazards, and chart annotations are of sufficient detail to allow navigation and safe mission accomplishment.
- Prepare maps for low level navigation IAW MCR 55-125 and/or as directed locally. Highlight all man-made obstacles at or above the planned flight altitude. Additionally, annotate low-level maps with time and/or distance tick-marks to ensure positive positional awareness of obstacles along the planned route of flight plus or minus 5 NM.
- Annotate all maps with a route abort altitude (RAA). Compute the RAA, for the entire route/area, at a minimum of 1,000 feet above the highest obstacle/terrain feature (rounded up to the next 100 feet) within the lateral limits of the route or training area, but in no case less than 5 NM either side of planned route.

##### 2.3.4. Night or simulated night radar low level flight map preparation:

- Annotate a minimum safe altitude (MSA) for each leg of the intended route of flight. The MSA is defined as an altitude which provides 1000 feet of clearance above the highest obstacle/terrain (rounded up to the next 100 feet), within 5NM of the planned course.
- As a minimum, annotate headings, maximum/minimum route structure altitudes, RAAs and MSAs on the chart. To ensure maps accurately display planned routes, planned night turn point bank angles should reflect realistic systems limitations.
- For night LANTIRN missions, flight leads should select letdown points that avoid initial descents into rugged or mountainous terrain.

#### **2.4. Briefing/Debriefing.**

2.4.1. Flight leaders are responsible for presenting a logical briefing which will promote safe, effective mission accomplishment.

- All crewmembers/passengers must attend the flight briefing unless previously coordinated with unit supervisors. Anyone not attending the flight brief must receive a briefing on mission events and emergency procedures.
- Briefers will reference applicable portions of briefing guides. 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.
- Review takeoff data, if required by the flight manual, and ensure every member of the flight understands it. Place particular emphasis on takeoff and abort factors during abnormal situations such as short/wet runway, heavy gross weights, non-standard cable configurations, and abort sequence in formation flights.
- When dissimilar aircraft are flown in formation, brief flight responsibilities, proper formation position (to ensure adequate wingtip clearance), and aircraft-unique requirements for each phase of flight.
- For all low-level mission briefings, place emphasis on obstacle/ground avoidance, altitude warning features (LAWS/MSL), low altitude comfort level, and complacency avoidance.
- For LANTIRN missions, emphasize ensuring the LANTIRN system is fully operational, the transition from medium altitude to low-level terrain following (TF) operations, and TF maneuvering limitations.
- Start briefings at least 1.5 hours before scheduled takeoff. Start alert briefings in sufficient time to be completed prior to aircrew changeover.
- Structure flight briefing to accommodate the capabilities of each aircrew member in the flight.
- WSOs should brief items applicable to rear cockpit duties during the mission.
- Brief an appropriate alternate mission for each flight. The alternate mission must be less complex than the primary and should parallel the primary mission. If not parallel, brief the specific mission elements that are different. Mission elements/events may be modified and briefed airborne as long as flight safety is not compromised. Flight leads will ensure changes are acknowledged by all flight members. Do not fly unbriefed missions/events.
- All missions will be debriefed.

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).

2.4.3. Mission briefing guides are contained in the Attachments. Units may augment these guides as necessary. Pending development by a higher headquarters, units that fly missions not covered by this instruction or its supplements will develop briefing guides for those missions and submit them to MAJCOM/DOT (ANG/XOOC, 19AF/DOK) for review.

## **2.5. Unit Developed Checklists/Local Aircrew Aids.**

2.5.1. Unit developed checklists may be used in lieu of flight manual checklists (except -25 checklists) provided they contain, as a minimum, all items (verbatim and in order) listed in the applicable checklist.

2.5.2. Units will produce an aircrew aid that, as a minimum, includes:

- Briefing Guides.
- Local radio channelization and airfield diagrams.

- Impoundment procedures, emergency action checklists, and NORDDO/divert information.
- Arresting gear information for divert bases.
- Bailout and Jettison Areas.
- Cross-country procedures to include: command and control, engine documentation, JOAP samples, and aircraft servicing.
- Other information as deemed necessary by the units. For example: stereo flight plans, turnaround procedures, local training areas, instrument preflight, and alert procedures.

**2.6. Stowing Equipment in Bay 5.** Stow containers or baggage with hard sides inside a Bay 5 cargo container. Without a cargo container, stow only locally manufactured fabric intake covers and soft-sided personal equipment baggage, such as a hang-up or A-3 bags, in Bay 5. Items stowed in Bay 5 will be:

- Positioned 1 foot aft of the top of the canopy thruster "catcher's mitt."
- Forward of the trailing edge of the aft circuit breaker panel on the right wall of Bay 5 (do not interfere with ICS cables).
- Below the top of the circuit breaker panels on the right wall of Bay 5.
- Secured with non-stretchable cord in such a manner to prevent movement in all three axes of motion. Place aircraft safety equipment and egress pins in locally manufactured fabric bags and stow in panels 154L, 35, 47L and R or in the cockpit map case. The pilot is responsible for ensuring items stowed in Bay 5 are loaded correctly and properly secured. Aircraft with items stowed in Bay 5, with or without a cargo container, are restricted from performing aerobatics and ACBT. The carriage restrictions for the Bay 5 cargo container are identical to the MXU-648/A cargo pod except for the airspeed restriction, which does not apply. This guidance does not preclude the pilot from taking any action necessary for safety of flight.

## Chapter 3

### NORMAL OPERATING PROCEDURES

**3.1. Ground Communications.** The pilot will accomplish the ground crew briefing (when required) in accordance with the briefing guide contained in this instruction. Prior to starting the JFS in a B/D/E model with the RCP occupied, the pilot will get an "Ok" signal from the rear cockpit occupant. Normally, the aircrew and ground crew will communicate using the intercom during all engine start and pre-taxi checks. Use the intercom system, to the maximum extent possible, anytime aircraft engines are operating and maintenance technicians are performing tasks on the aircraft. Units with active air defense commitments may waive the use of intercom during alert scrambles.

**3.2. Ground Visual Signals.** When ground intercom is not used, use visual signals IAW AFI 11-218 and this instruction. All signals pertaining to operation of aircraft systems will originate with the pilot. The crew chief will repeat the given signals when it is safe to operate the system. The aircrew should not activate any system that could pose danger to the ground crew prior to receiving proper acknowledgment from ground personnel. The following signals augment AFI 11-218.

- JFS START. With clenched fist, pilot makes a pulling motion.
- FLIGHT CONTROLS CHECK. Raise arm, clench fist, and make a stirring motion.
- 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).
- EEC/DEEC Check. With the fingers and thumb of each hand extended and joined at the tips, open and close the fingers and thumbs of both hands simultaneously, simulating nozzle opening and closing.
- LOSS OF BRAKES WHILE TAXIING. Lower tailhook.
- GUN ARMAMENT CHECK. Point index finger forward with thumb upward simulating a pistol and shake head (yes or no).

**3.3. Preflight.** Do not carry baggage/equipment in an unoccupied F-15B/D/E rear cockpit (Exception: forms/maps may be stowed in the map case).

#### **3.4. Ground Operations.**

3.4.1. The minimum taxi interval is 150 feet staggered or 300 feet in trail. Spacing may be reduced when holding short of or entering the runway.

3.4.2. Do not taxi during snow and/or icy conditions until the taxi route and runway have been checked for safe conditions. In this case, taxi on the centerline with a minimum of 300 feet spacing.

3.4.3. Maximum taxi speed during sharp turns is 10 knots. Above 10 knots the aircraft may skid and/or depart the three point attitude.

3.4.4. Quick Check and Arming. Keep hands in view of ground personnel during quick check, arming or dearming operations. If the intercom system is not used during EOR checks, the aircrew will establish and maintain visual contact with the ground personnel to allow the use of visual signals.

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

**3.5. Flight Lineup.** Flights will line up as appropriate based on weather conditions, runway conditions, and runway width. Use a minimum of 500 feet spacing between separated elements/flights. For 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/element releases brakes.

**3.6. Before Takeoff Checks.** Just 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.

**3.7. Takeoff.**

3.7.1. Do not takeoff if the RCR is less than 12.

3.7.2. On training missions, do not takeoff if the computed takeoff roll exceeds 80 percent of the available runway.

3.7.3. When operating from airfields equipped with a compatible, remotely operated cable, ensure the departure end cable is raised for all takeoffs and landings, unless another departure end cable is in place.

3.7.4. Use a minimum of 10 seconds (15 seconds when using afterburners) takeoff interval between aircraft/elements. When joining "on top" or carrying live air-to-surface ordnance, use a minimum of 20 seconds takeoff interval.

3.7.5. Aircraft/elements will steer toward the center of the runway at the start of the takeoff roll.

3.7.6. During rolling takeoffs, align the aircraft with the runway heading prior to advancing the throttles.

3.7.7. Wing/Group Commander or Ops Group Commander (SOF for ANG) may approve intersection takeoffs if operational requirements dictate.

**3.8. Formation Takeoff.**

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

3.8.2. Elements must be led by a qualified flight leader unless an IP or flight lead qualified squadron supervisor is in the element.

3.8.3. Aircraft must be within 3,000 pounds weight of each other and symmetrically loaded. Consider symmetrically loaded as those store loadings which do not require an abnormal trim or control application to counter a roll or yaw during takeoff and acceleration to climb airspeed.

3.8.4. For rolling formation takeoffs, the wingman must be properly aligned on the runway prior to the flight lead advancing the throttle for takeoff.

3.8.5. Do not make formation takeoffs when:

- The runway width is less than 125 feet.
- There is standing water, ice, slush, or snow on the runway.
- The crosswind or gust component exceeds 15 knots.
- Loaded with live munitions (excluding air-to-air missiles, 20mm ammunition, 2.75 rockets, and chaff/flares).
- Ferrying aircraft from a contractor or AFLC facilities.

- The computed takeoff roll exceeds 70% of the available runway.

### **3.9. Join-up/Rejoin.**

3.9.1. Day weather criteria for a VFR join-up underneath: ceiling 1,500 feet and visibility 3 miles.

3.9.2. Flight leaders will maintain 350 KIAS until join-up is accomplished unless mission requirements necessitate a different airspeed.

3.9.3. Flight leaders should limit their angle of bank to 30 degrees for turning rejoins immediately after takeoff.

3.9.4. 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. 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 direct the desired formation positions.

3.9.5. Battle Damage/Bomb Checks. When circumstances permit, flight leads will direct a battle damage/bomb check after each mission prior to or during RTB. Except at night/IMC, this check is mandatory following the expenditure of any ordnance (including all types of 20mm ammunition). Brief deconfliction responsibilities and position change procedures. Fly no closer than fingertip formation spacing.

3.9.6. For further join-up procedures, see Night Joinup (3.21.3) and Chapter 4.

### **3.10. Formation, General.**

3.10.1. In IMC, the maximum flight size is four aircraft except when flying in close formation with a tanker (refer to T.O. 1-1C-1-25).

3.10.2. Do not use rolling maneuvers to maintain or regain formation position below 5,000 feet AGL or in airspace where aerobatics are prohibited.

3.10.3. Airborne visual signals will be in accordance with AFI 11-205. For four-ship flights, configuration changes will be initiated 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.

3.10.4. Flight leaders will not break up formations until each wingman has a positive fix from which to navigate (visual, radar, INS, or TACAN).

3.10.5. Changing Leads.

- When flying in limited visibility conditions, initiate lead changes from a stabilized, wings level attitude.
- The minimum altitude for a lead change is 500 feet AGL over land or 1,000 feet AGL over water (for night see paragraph 3.21.4, for IMC see paragraph 4.6).
- Do not initiate lead changes with the wingman further aft than 30 degrees from line abreast.
- Flight/element leads will not initiate a lead change unless the aircraft assuming the lead is in visual contact and in a safe position to do so.
- Initiate a lead change by visual signal or radio call.

- Acknowledge receipt of the lead by head nod or radio call, as appropriate.
- A lead change is effective upon acknowledgment.
- The former leader then moves to the appropriate wing position.

### **3.11. Tactical Formation.**

3.11.1. General. Apply the following rules 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 must maneuver relative to the flight lead/lead element and maintain sight. Trailing aircraft/elements are responsible for deconflicting with lead aircraft/elements.
- Wingmen/elements will cross above the lead/lead element when deconfliction is required.

3.11.1.1. Loss of Visual. Use the following procedures when one or more flight members/elements lose visual contact within the formation:

- When any flight member/element calls “Blind,” then the appropriate flight member/element will immediately respond with “Visual” and a position report or “Blind.”
- When the other flight member/element is also “Blind,” then the flight leader will take action to ensure altitude separation between flight members/elements. The flight lead will specify either AGL or MSL when directing the formation to deconflict and use a minimum of 500 feet altitude separation. Avoid climbs/descents through the deconfliction altitude when possible.
- When there is not a 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 to include a Terminate/Knock-It-Off call if necessary. Consider scenario restrictions such as sanctuary altitudes and/or adversary blocks.
- Aircraft will maintain altitude separation until a visual is regained and, if necessary, will navigate with altitude separation until mutual support is regained.

3.11.2. Two-Ship. The following rules apply for flight path deconfliction during tactical maneuvering of two-ship formations:

3.11.2.1. Normally, the wingman is responsible for flight path deconfliction.

3.11.2.2. The flight lead becomes responsible 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 the engaged fighter).
- The wingman calls “padlocked.”
- The wingman calls “blind.”
- Deconfliction responsibility transfers back to the wingman once the wingman acknowledges a visual on his lead.

3.11.3. 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 sufficient spacing so that primary emphasis during formation maneuvering/turns is on low altitude awareness and deconfliction within elements, not on deconfliction between elements.

### **3.12. Chase Formation.**

3.12.1. 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 or hung ordnance patterns. Specialized missions (i.e., OT&E, WSEP, live weapons delivery, etc.) and training conducted IAW MCI 11-F15 Vol 1 or MCI 11-F15E Vol 1 may be chased by MR/MC pilots designated by Group/Squadron Commanders. All other chase events may only be flown by IP/SEFEs or upgrading IPs under the supervision of an IP.

3.12.2. Procedures:

- A safety observer in a chase aircraft, except IP/SEFE/specialized mission chase, will maneuver in a 30-60 degree cone with nose/tail clearance to 1,000 feet, to effectively clear and/or provide assistance.
- IP/SEFE/specialized mission aircraft will maneuver as necessary, but must maintain nose/tail separation.
- No chase aircraft will stack lower than the lead aircraft when below 1,000 feet AGL.
- For live ordnance missions, the chase pilot is responsible for maintaining own ship frag deconfliction.

**3.13. Show Formation.** Brief and fly show formations as approved. Refer to AFI 11-209 and applicable MAJCOM directives for specific rules and appropriate approval levels to participate in static displays and aerial events.

### **3.14. Maneuvering Parameters.**

3.14.1. Minimum Altitudes.

- Nose high/low speed recoveries and AHC vertical maneuvers - 10,000 feet AGL.
- Aerobatics - Remain above 5,000 feet AGL during any aerobatic maneuvering.

3.14.2. Avoid flight through wingtip vortices and jetwash. If it is unavoidable, immediately unload the aircraft to approximately 1 G.

3.14.3. Do not extend flaps to improve aircraft maneuvering performance during ACBT.

### **3.15. Ops Checks.**

3.15.1. Accomplish sufficient ops checks to ensure safe mission accomplishment. Additionally, each aircrew should monitor the fuel system carefully throughout the flight to identify low fuel, trapped fuel or out of balance situations as soon as possible. Ops checks are required:

- During climb or at level-off after takeoff.

- Prior to each (D)ACBT engagement or intercept. In addition, a check for proper operation of all transfer tanks (wing tanks/CFTs balanced and tank 1 feeding) will be performed prior to and between engagements or planned maneuvering above 30 units AOA.
  - Prior to entering an air-to-surface range, once while on the range if multiple passes are made, and after departing the range.
- 3.15.2. Minimum items to check are engine instruments, total and internal fuel quantities/balance, G-suit connection, oxygen system, cabin altitude, and G meter/OWS.
- 3.15.3. For formation flights, the flight leader may initiate ops checks by radio call or visual signal and wingmen will respond appropriately.
- The query and response for ops checks will include pointer over counter readings (Example: “11.5 over 13.1” Exception: Total fuel only may periodically be used during high demand phases of flight). Add a “balanced” call to the normal Ops Check reply when wing fuel balance checks are required and the difference is no greater than 200 lbs.
  - When more than one external tank is carried, add a “tanks feeding” call to the normal Ops Check reply. Once the tanks have been confirmed and called empty, omit this call from subsequent Ops Checks.
- 3.15.4. G-awareness Exercise - Reference AFI 11-214 Para 2.7.1. and MCM 3-3, Chapter 9.

### **3.16. Radio Procedures.**

- 3.16.1. Preface all communications with the complete flight call sign unless excepted below. Transmit only that information essential for mission accomplishment or safe flight. Do not use any radio as a flight “intercom.” Use visual signals when practical.
- 3.16.2. Make a “Knock-It-Off”(KIO)/“Terminate” radio call to cease tactical maneuvering for any reason, particularly when a dangerous situation is developing. Any flight member may make this call. A KIO applies to any phase of flight and any type of mission. All participants will acknowledge a KIO by repeating the call.
- 3.16.3. The flight/mission leader will initiate all radio checks and channel changes. Individual flight members will acknowledge, in turn, by callsign prior to any flight member switching channels unless briefed otherwise.
- 3.16.4. Acknowledge radio checks which do not require the transmission of specific data by individual flight members in turn (Example: “2, 3, 4”). Acknowledgment indicates the appropriate action is complete, in the process of being completed, or the flight member understands.
- 3.16.5. In addition to the radio procedures outlined in AFI 11-203, 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 Checks. Each pilot will report gear down on base leg, or, if making a VFR straight-in approach not later than 3 miles on final. When flying an instrument approach, report gear down in response to ATC instructions or no later than the final approach fix or glide path interception point. A wingman or chase need not make this call during a formation or chased approach.
- 3.16.6. Use brevity code and other terminology IAW AFI 11-214, MCM 3-1, Vol I and local standards.

**3.17. Change of Aircraft Control.** Both aircrew members of an F-15B/D/E must know at all times who has control of the aircraft. Use the statement “You have the aircraft” to transfer aircraft control. The aircrew member receiving control of the aircraft will acknowledge “I have the aircraft.” Once assuming control of the aircraft, maintain control until relinquishing it as stated above. Exception: If the intercom fails, the pilot in the front cockpit (if not in control of the aircraft) will shake the stick and assume control of the aircraft, radios, and navigational equipment unless prebriefed otherwise.

**3.18. General Low Altitude Procedures.**

3.18.1. Fly low level formation positions/tactics using MCM 3-1 and MCM 3-3, Fighter Fundamentals, as guides.

3.18.2. Line abreast formation is authorized at or above 300 feet AGL. When flying below 300 feet AGL, direct the wingman to a wedge formation position.

3.18.3. Training in the 300 feet to 100 feet AGL altitude block will be in short segments consistent with real-world risks and realistic tactical considerations.

3.18.4. During briefings, emphasize low altitude flight maneuvering and observation of terrain features/obstacles along the route of flight. For low altitude training over water/featureless terrain, include specific considerations with emphasis on minimum altitudes and spatial disorientation.

3.18.5. All obstacle avoidance planning will be based on Minimum Safe Altitude (MSA) and Route Abort Altitude (RAA) as defined in paragraph 2.3.3.

3.18.6. If unable to visually acquire or ensure lateral separation from known vertical obstructions which are a factor to the flight, flight leads will direct a climb NLT 3 NM prior to the obstacle to ensure vertical separation. The climb must be to an altitude at or above briefed RAA/MSA. Do not descend below this altitude until positional/situational awareness dictates it is safe to do so.

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

3.18.8. When crossing high or hilly terrain, maintain positive G and do not exceed approximately 120 degrees of bank. Maneuvering at less than 1G is limited to upright bunting maneuvers.

3.18.9. The minimum airspeed for low level navigation is 300 KIAS. Minimum airspeed during TF operations is the specified flight manual minimum.

3.18.10. Minimum Altitudes. The unit commander will determine and certify aircrews' minimum altitude IAW MCI 11-F15 or 11-F15E Vol 1, as supplemented. Aircrew members participating in approved step-down training programs will comply with the requirements and restrictions of that program. The following minimum altitudes apply to low level training unless higher altitudes are specified by national rules, route restrictions, or a training syllabus:

3.18.10.1. 500 feet AGL for:

- LOWAT Category I qualified aircrews.

3.18.10.2. 300 Feet AGL for:

- LOWAT Category II qualified aircrews.
- F-15E FTU students and instructors when conducting training IAW an applicable syllabus.

3.18.10.3. 100 AGL for:

- LOWAT Category III qualified aircrews.

3.18.10.4. For night or IMC operation:

- The minimum altitude is 1000 feet above the highest obstacle within 5 NM of course unless operating under the conditions of paragraph 3.19, LANTIRN Operations.

**3.18.10.5. (ACC/ANG) 57 FW and AATC will fly low level as required for test sorties or IAW Weapons School Syllabi.**

3.18.10.6. For aircraft equipped with an operable radar altimeter, the system will be on and the LAWS set at 90 percent of the briefed minimum altitude or 90 percent of the command-directed altitude, whichever is higher. Adjust the setting as appropriate for each applicable phase of flight.

3.18.11. During all low altitude operations, the immediate reaction to task saturation, diverted attention, knock-it-off, or emergencies is to climb to a prebriefed safe altitude (minimum 1000 feet AGL).

3.18.12. Weather minimums for visual low level training are 1,500 feet ceiling and 3 miles visibility for any route or area, or as specified in FLIP for Military Training Routes, unit regulations, or national rules, whichever is higher.

3.18.13. Low Level Route/Area Abort Procedures:

3.18.13.1. Compute and brief a low level route abort altitude (RAA) for all low level operations IAW paragraph 2.3.3.

3.18.13.2. VMC route/area abort procedures:

- Maintain safe separation from the terrain and other aircraft.
- Comply with VFR altitude restrictions and squawk applicable (IFF/SIF) modes and codes.
- Maintain VMC at all times. If unable, follow IMC procedures outlined below.
- Attempt contact with controlling agency, if required.

3.18.13.3. IMC route/area abort procedures:

- Immediately climb to, or above, the briefed RAA.
- Maintain preplanned ground track. Execute appropriate lost wingman procedures if necessary.
- If deviations from normal route/area procedures are required, or if the RAA/MSA 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 IFR clearance is received.

### **3.19. LANTIRN Operations. (N/A ANG)**

3.19.1. The minimum altitude for LANTIRN training will be the higher of VR/IR/MOA minimum altitude or aircrew minimum altitude as certified by the unit commander IAW MCI 11-F15E Vol 1.

3.19.2. Operational Procedures.

- Base all obstacle avoidance planning on MSA and RAA. Reference paragraph 2.3.3 for definitions.
- An operational LANTIRN system is required to conduct night low level operations below MSA.
- Unarmed TF operations in IMC are prohibited.
- During TF navigation operations, the pilot will maintain 400 KIAS minimum airspeed in mountainous terrain. If airspeed decreases below 400 KIAS, the pilot will immediately accelerate above 400 KIAS.
- Plan turn point bank angles for night/IMC low level missions based on the bank angle limits of the TFR system.
- Check TFR/LANTIRN systems inflight using flight manual procedures (Dash 1) on every flight involving TFR/LANTIRN operations. TF flight is not authorized until these checks are accomplished and TF systems provide terrain clearance commands. The intent is to ensure all LANTIRN systems are functioning properly prior to sustained low altitude LANTIRN operations. If any feature that is critical to overall system performance (i.e. CARA, INS) is questionable or disabled, discontinue the checks and/or LANTIRN portion of the mission.
- Overall responsibility to determine minimum equipment required for TF operations is at the wing level. However as a minimum, lists will include an operational TF radar, radar altimeter, NAV FLIR HUD display and an E-SCOPE. Additionally, for IMC TF operations, an operational A/A and A/G radar is required.
- Each crew will confirm by inter-cockpit communication that the TFR and radar altimeter are on and working properly before descending below the MSA. *(ACC) Flight leaders will ensure members of their flight have their TFR/LANTIRN systems and radar altimeters operating prior to descending below the MSA for LANTIRN operations. This check will be initiated by radio call: "(Call Sign) 1 - TFR: On, Radar Altimeter: On." and will be repeated, not simply acknowledged, by each member of the flight.*
- Initially set a 1000 feet AGL set clearance plane (SCP) to verify proper systems operation prior to commencing letdown to a lower SCP.
- During low altitude operations, the pilot will not operate any heads down sensor while flying outside of TF system limits. Sole attention will be placed on aircraft attitude, altitude and airspeed.
- Threat reactions, to include simulated employment of air-to-air ordnance, will be within TF system limits when below the applicable MSA or RAA.
- Any maneuvering that will put the aircraft outside of TFR limits, negating fly-up protection, will be at or above the applicable MSA or RAA.

### 3.19.3. VRD Restrictions.

- Use the VRD only during actual day LANTIRN training on low level routes or weapons deliveries.
- A safety observer is required for all TF operations with a VRD. The safety observer will be a crewmember, qualified in that aircraft, occupying the rear cockpit.

### 3.19.4. Abnormal Operation.

3.19.4.1. Aircrews who experience failure of any portion of the TF system or HUD/FLIR imagery while flying night low level will immediately climb to, or above, the MSA/RAA. If the failure(s) can be cleared and safe TF regained, TF operations may resume. If the aircraft position cannot be accurately determined,



aircrews will terminate the low level portion of the mission and execute route abort procedures IAW paragraph 3.18.13.3.

3.19.4.2. For night operations, if the TFR/LANTIRN system fails prior to route entry, aircrews may still enter the route and continue the mission at the MSA, provided the above provisions are met.

3.19.4.3. The guidance in the previous two paragraphs does not preclude aircrews from flying to a weapons delivery range at medium altitude and conducting night weapons delivery events as required.

3.19.4.4. Use the following procedures if NAV FLIR visibility is insufficient for use as an aid for terrain avoidance:

- If day TF and using the HUD cover, remove the cover and continue visually or aircrews may proceed using IMC procedures if qualified.
- If night TF, climb to MSA/RAA or if IMC TF qualified and on an IR route, aircrews may continue using IMC procedures.

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

### **3.21. Night Procedures.**

#### 3.21.1. Night Ground Operations.

- When ground personnel are working under the aircraft, the anti-collision lights should be OFF and the position lights STEADY.
- Taxi on the taxiway centerline with a minimum of 300 feet spacing.
- Use the taxi light while taxiing unless it might interfere with 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.
- For formation takeoffs, flight/element leaders will turn anti-collision lights OFF and position lights STEADY when reaching the run-up position on the runway. Wingmen will maintain the anti-collision light ON and position lights STEADY for takeoffs.

3.21.2. Night Takeoff. During a night formation takeoff, direct brake release, configuration changes and AB termination on the radio. Following takeoff, each aircraft/element will climb on runway heading to 1,000 feet AGL before initiating turns, except where departure instructions specifically preclude compliance.

3.21.3. Night Joinup. Weather criteria for night joinup underneath is a ceiling of 3,000 feet and 5 miles visibility. After joinup, turn all the anti-collision lights OFF and position lights to STEADY except for the last aircraft in formation, which will keep the anti-collision light ON unless otherwise directed by the flight lead.

#### 3.21.4. Night Formation Procedures.

- When in positions other than fingertip, route, or tactical, maintain aircraft spacing primarily by instruments, RADAR/AAI, and/or timing with visual reference secondary. If aircraft spacing cannot be ensured, then establish altitude separation (1,000 feet minimum). Cross-check instruments at all times to ensure ground clearance.
- Do not change lead or wing formation positions below 1,500 feet AGL unless on RADAR downwind. Direct lead and position changes using the radio and from a stabilized, wings-level attitude.

3.21.5. Night Fingertip/Route Position. Night references for fingertip and route formation positions are specified in MCM 3-3.

3.21.6. Night Break-up. Prior to a formation break-up at night, the flight leader will transmit attitude, altitude, airspeed, and altimeter setting, which will be acknowledged by wingmen. Wingmen will confirm good navigational aids.

3.21.7. Night Landing. Normally land from an instrument straight-in approach. Refer to AFI 11-206, as supplemented for specific procedures.

- Only perform night formation landings when required for safe recovery of the aircraft.

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

3.22.1. USAF/MAJCOM guidance (including AFI 11-206, AFI 11-214, and AFR 160-43) outline NVG procedures. MCM 3-1 and MCM 3-3 will incorporate expanded tactical guidance. Additionally:

- NVGs will only be worn by qualified aircrews or when upgrading with NVGs with a qualified NVG instructor 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 at the discretion of the unit commander. All control and performance instruments must be illuminated by an NVG-compatible light source to provide immediate reference.
- Fly all NVG sorties in VMC.
- All flight members will make a radio call or use a briefed clear visual signal, such as beacons off/on, when going "goggles on" or "goggles off" and only one aircraft will don/doff goggles at a time.
- Flight leads must ensure all aircraft maintain adequate separation during the donning and re-focusing process.

3.22.2. NVGs must be preflight tested and adjusted for the individual in the unit eyeline prior to NVG operations. Do not wear NVGs during takeoff or landing. Do not don NVGs until at least 2,000 feet AGL in climbing or level flight. In all cases, remove NVGs prior to the final approach fix.

3.22.3. Minimum altitude while using NVGs is 1,000 feet AGL. Established night weather minimum criteria apply for NVG operations IAW AFI 11-206 and AFI 11-214.

3.22.4. NVGs may be worn for night tanker rejoins, but will be raised to the up/stowed position or removed no later than the precontact position.

3.22.5. Unless required for battle damage checks or aircraft assistance, wingmen wearing NVGs will fly no closer than route formation.

3.22.6. Battle Damage Checks. NVGs will remain on. The aircraft performing the check will approach with position lights bright steady/flash or beacons on while the aircraft being checked sets external lights to a minimum, preferably off.

3.22.7. Inflight Emergencies with NVGs. During inflight emergencies, immediately assess whether the NVGs aid or hinder completing emergency procedures. If they are a hindrance or the emergency may deteriorate into an ejection situation, remove and stow the NVGs.

3.22.8. Abnormal Procedures.

3.22.8.1. Lost sight. If you lose sight within a flight, consider highlighting position by increasing exterior lighting level, activating the afterburners, or deploying chaff/flares as the situation warrants.

3.22.8.2. NVG failure. Ensure separation from other aircraft and the ground before attempting to remedy the NVG failure.

- Transition to instruments.
- Perform lost wingman procedures if appropriate.
- Route abort/climb above MSA if appropriate.
- Terminate/KIO as applicable.
- If other aircraft are in the vicinity, direct them to raise their external lights to non-NVG visible levels.
- Attempt to regain NVG operation by switching to the opposite battery. Once clear of other aircraft and terrain, change the battery. If these steps do not solve the problem, stow NVGs and proceed with non-NVG plan.

3.22.8.3. Inadvertent flight into weather. Encountering poor weather conditions during NVG operations may cause loss of SA and aircrew distraction/disorientation.

3.22.8.3.1. Single ship or separated from flight members:

- Transition to instruments.
- Route abort if LOWAT, otherwise climb/descend to VMC.
- Terminate/KIO as applicable.

3.22.8.3.2. Formation flight. If entering weather in formation/close proximity to other aircraft, perform the first five steps under NVG failure, as appropriate, then climb/descend to attempt to regain VMC.

### **3.23. Fuel Requirements.**

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

3.23.2. 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 listed below:

- Normal Recovery Fuel. The fuel on initial or at the FAF at the base of intended landing or alternate, if required. Fuel quantity will be as established locally or 1,500 pounds, whichever is higher.

3.23.3. Declare the following when 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:

- Minimum Fuel - 1200 pounds or less.
- Emergency Fuel - 800 pounds or less.

### **3.24. Approaches and Landings.**

3.24.1. The desired touchdown point for a VFR approach is 500 feet from the threshold or the glidepath interception point for a precision approach. When local procedures or unique conditions require landing beyond the normal touchdown point, adjust the touchdown point accordingly.

3.24.2. Minimum pattern and touchdown spacing between landing aircraft is 3,000 feet for similar aircraft (e.g. F-15/F-15E versus F-15/F-15E), 6,000 feet for dissimilar aircraft (e.g. F-15/F-15E versus F-16) or as directed by MAJCOM or the landing base, whichever is higher. Increase spacing whenever wake turbulence is anticipated.

3.24.3. Normally, all aircraft will land in the center of the runway and clear to the turnoff (cold) side of the runway when speed/conditions permit.

3.24.4. Landing Restrictions.

- When the computed landing roll exceeds 80 percent of the available runway, land at an alternate if possible.
- Do not land over any raised web barrier (e.g. MA-1A, 61QS11).
- During the aerobrake portion of a normal, dry runway landing, leave flaps down to provide increased aerodynamic drag and normal nose fall.
- *(ACC/ANG) When the RCR at the base of intended landing is less than 12, land at an alternate if possible. If an alternate is not available, make an approach end arrestment.*

### 3.25. Overhead Traffic Patterns.

3.25.1. Overhead patterns can be made with unexpended practice ordnance and unexpended live air-to-air ordnance.

3.25.2. Initiate the break over the touchdown point or as directed.

3.25.3. Execute individual breaks 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).

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

**3.26. Tactical Overhead Traffic Patterns.** Tactical entry to the overhead traffic pattern is permitted when:

- The published overhead pattern altitude and airspeed are used.
- Specific procedures are developed and coordinated with appropriate air traffic control agencies.
- No more than four aircraft are in the flight. Aircraft/elements more than 6,000 feet in trail are considered a separate flight.
- No aircraft are 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.
- Normal downwind, base turn positions, and spacing are flown.

### 3.27. Touch-and-Go Landings.

3.27.1. Fly touch-and-go landings IAW AFI 11-206, as supplemented by MAJCOM.

3.27.2. Do not fly touch-and-go landings with live or hung ordnance (except a safed 20mm gun) or with fuel remaining in any external tank.

### **3.28. Low Approaches.**

3.28.1. Observe the following minimum altitudes:

- Normal/no flap single ship low approaches - so that touchdown does not occur.
- IP/SEFEs flying 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.

3.28.2. 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/climbout procedures, or controller instructions dictate otherwise.

**3.29. Closed Traffic Patterns.** Initiate the pattern at the departure end of the runway unless directed/cleared otherwise by local procedures or the controlling agency. When in formation, a sequential closed may be flown with ATC concurrence at an interval to ensure proper spacing. Plan to arrive on downwind at 200-250 KIAS.

### **3.30. Back Seat Approaches and Landings.**

3.30.1. A rear-cockpit (RCP) landing qualified instructor pilot may accomplish back seat landings. An upgrading IP may only accomplish back seat landings when a RCP landing qualified IP is in the front cockpit.

3.30.2. During back seat approaches and landings, the front seat pilot will visually clear the area, monitor aircraft parameters and configurations, and be prepared to direct a go-around or take control of the aircraft (as briefed by the rear cockpit IP) if necessary.

### **3.31. Formation Approaches and Landings.**

3.31.1. General:

- Normally accomplish formation landings from a precision approach. If not, accomplish the landing from a published instrument approach or a VFR straight-in approach using the VASI, if available. In all cases, use a rate of descent similar to a normal precision approach.
- Continuation training formation landings must be led by a qualified flight leader unless an IP or flight lead qualified squadron supervisor is in the element.
- Do not practice formation approaches with a combined fuel/stores weight greater than 10,000 pounds.
- Aircraft must be within 3,000 pounds weight of each other and symmetrically loaded as defined in paragraph 3.8.3.
- Position the wingman on the upwind side if crosswind exceeds 5 knots.
- The wingman must maintain a minimum of 10 feet lateral wingtip spacing.

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

3.31.2. Formation landings are prohibited:

- When the crosswind or gust component exceeds 10 knots.
- When the runway is reported wet; or ice, slush, or snow is on the runway.
- When runway width is less than 125 feet.
- When landing with hung ordnance or unexpended live ordnance (excluding live air-to-air missiles, 20mm ammunition, 2.75 rockets, or chaff/flares).
- When the weather is less than 500 feet and 1.5 miles or a flight member's weather category, whichever is higher.

**3.32. After Shutdown Procedures.** All aircrews will accomplish a post flight walk-around. The intent of this inspection is to find evidence of birdstrike, lost panels, damaged ordnance, structural damage resulting from over-Gs or other inflight abnormalities.

**3.33. F-15E Crew Duties.** Unless briefed otherwise during the crew coordination brief, the following duties apply. (Exception: The restrictions listed in paragraph 3.33.2 may not be altered.)

3.33.1. General:

- Both crewmembers are responsible for the successful completion of each assigned mission. Conduct a crew briefing before each flight to ensure that both crewmembers are thoroughly familiar with all aspects of the mission. Brief radar and visual lookout responsibilities, crew coordination, and specific duties during each phase of flight.
- The pilot will establish and brief the WSO on flight parameters anticipated during each phase of flight. Both crewmembers will monitor aircraft instruments, aircraft position, nav aids, fuel status, and armament.

3.33.2. WSO Flying. WSOs will not fly during:

- Takeoff or landing.
- AAR operations.
- Close formation or rejoins to close formation.
- Tactical maneuvering.
- Weapons delivery (actual or simulated).
- *(ACC) Below 2,000 feet AGL.*
- *(ACC) Instrument approaches (GCA, ILS, etc).*
- *(ACC) Instrument patterns (under RAPCON control) or VFR patterns.*

3.33.3. Use of Checklist. The pilot and WSO will use the appropriate checklists in accomplishing all items from preflight through engine shutdown. Both crewmembers are responsible for handling inflight emergencies.

3.33.4. Prestart. The pilot will accomplish the ground crew briefing, when required, in accordance with the briefing guide contained in this instruction.

3.33.5. Communications. The crewmember not in control of the aircraft will normally control the radio and navigational equipment.

3.33.6. Takeoff. The WSO will check the Min go/Max abort speed when required, monitor engine/flight instruments, check gear and flaps up, and advise the pilot of any discrepancies.

3.33.7. Climb/Departure.

- The aircrew member flying the aircraft will call altimeter setting to 29.92 when passing the transition altitude.
- The aircrew member not in control of the aircraft will monitor the published or clearance departure procedures.
- Accomplish a complete weapons systems check on each flight to the maximum extent possible.

3.33.8. Cruise/Navigation/Instrument Flight. The WSO will:

- Relay aircraft attitude/altitude/airspeed information to the pilot when departing a formation in weather/night flying conditions.

3.33.9. Air-to-Air Procedures:

3.33.9.1. General intercepts:

- The aircrew member in command of the radar will acknowledge target position information, acquire radar contact, and assume control of the intercept in accordance with AFI 11-214.
- The aircrew member not in command of the radar will provide descriptive commentary, assist as necessary in accomplishing the intercept and will monitor the position of other flight members in the formation.

3.33.9.2. Pilot responsibilities, ACBT/intercepts:

- Acknowledge and comply with weapons controller instructions in accordance with AFI 11-214.
- Monitor radar scope and attempt visual contact with the target.
- Monitor armament status.
- Visually ensure required fighter-target separation.

3.33.9.3. WSO responsibilities, ACBT/intercepts:

- Verify armament switches are set.
- Monitor radar scope, evaluate target position, and clear six o'clock.
- Maintain visual area surveillance.

- Provide descriptive/directive commentary as to bogey location and required maneuvers.
  - Monitor armament status.
- 3.33.10. Visual Air-to-Surface Weapons Deliveries:
- 3.33.10.1. Pilot responsibilities:
- Ensure positive identification of the target.
  - Perform weapons delivery and escape maneuvers with particular emphasis on threat and fragmentation envelopes.
- 3.33.10.2. WSO responsibilities:
- Aid the pilot in locating and identifying the target.
  - Monitor delivery and escape maneuvers with particular emphasis on altitude and airspeed.
- 3.33.11. Radar/PGM Air-to Surface Deliveries:
- 3.33.11.1. Pilot responsibilities:
- Perform armament checks, weapons delivery, and escape maneuvers. Be prepared to initiate alternate delivery.
- 3.33.11.2. WSO responsibilities:
- Acquire and designate the target on the radar or targeting pod unless otherwise briefed.
  - Monitor delivery and escape maneuvers with particular emphasis on altitude and airspeed.
- 3.33.12. Air Refueling:
- 3.33.12.1. Pilot responsibilities:
- Accomplish the air refueling and, if not accomplishing the refueling, be prepared to immediately press the air refueling release button when the IP/UIP in the rear seat is accomplishing the refueling.
- 3.33.12.2. WSO responsibilities:
- Advise the pilot of boom position and call when boom is positively clear/disconnected.
- 3.33.13. Penetrations/Descents:
- The aircrew member in control of the aircraft will advise the other crewmember of intentions when performing any penetration or approach. Both crewmembers must confirm the DH/MDA for an approach, or the RAA/MSA altitude for descents into low level routes.
  - Both crewmembers will refer to appropriate FLIP publications during the holding, penetration, and approach.
  - The crewmember not in control of the aircraft will verbally check altimeter settings and altitude when passing transition altitude. Additionally, advise the other crewmember when 1,000 feet above any intermediate level off altitude, 100 feet above decision height/minimum descent altitude for the



approach being flown, or when 100 feet above the minimum altitude during descents into low level routes.

3.33.14. Landing. The crewmember not in control of the aircraft will:

- Monitor the landing pattern with emphasis on engine power, altitude, airspeed, and landing and flap position.
- Visually clear the area.
- Monitor groundspeed versus runway remaining during the landing roll to assess aerobraking effectiveness and available stopping distance.

3.33.15. After landing. The pilot will:

- Take control of the aircraft when the rear seat IP accomplishes the landing.
- Taxi the aircraft.

## Chapter 4

### INSTRUMENT PROCEDURES

#### 4.1. Approach Category.

4.1.1. The F-15/F-15E are Approach Category E. Accomplish missed approach IAW flight manual procedures. Missed approach airspeed is 200-250 KIAS.

4.1.2. Use approach Category D minimums at an emergency/divert airfield where no Category E minimums are published provided:

- A straight-in approach is flown.
- The aircraft is flown at a final approach airspeed of 165 KIAS or less.
- The aircraft is flown at 255 knots true airspeed (KTAS) or less for the missed approach segment of the approach. At high pressure altitudes and temperatures 255 KTAS may not be compatible with published missed approach airspeeds and Category D approaches should not be flown.

4.1.3. The F-15/F-15E's INS is approved for en route Area Navigation (RNAV). The en route navigation may not exceed 1.5 hours between INS updates. An update is defined as establishing a positive position using visual, TACAN, or on-board radar. Do not fly RNAV approaches.

#### 4.2. Takeoff and Joinup.

4.2.1. The flight leader must get an appropriate ATC clearance (altitude block or trail formation) when a flight joinup is not possible due to weather conditions or operational requirements. Formation trail departures must comply with instructions for a nonstandard formation flight as defined in FLIP.

4.2.2. If weather is below 1500 feet and 3 miles, each aircraft/element will climb on takeoff heading to 1,000 feet AGL before initiating any turns, except when departure instructions specifically preclude compliance.

#### 4.3. Trail Procedures.

4.3.1. General.

- During trail formations, basic instrument flying is the first priority and must not be sacrificed when performing secondary trail tasks. Strictly adhere to the briefed airspeeds, power settings, altitudes, headings, and turn points. If task saturation occurs, cease attempts to maintain trail, concentrate on flying the instrument departure, and then notify the flight lead. The flight lead will then notify air traffic control (ATC).
- Flight leaders will request non-standard formation from ATC.
- ATC instructions issued to the lead aircraft apply to the entire flight.
- Flight leads will brief aircraft/element spacing. Minimum spacing between aircraft is 9,000 feet.
- Each aircraft/element will follow the No Radar Contact procedures until the aircraft/element immediately in trail has radar contact and called "tied."

4.3.2. No Radar Contact.

- The flight leader will call initiating all turns. Subsequent aircraft must delay turns to maintain the desired spacing.
- Each aircraft/element will maintain 20 seconds or 2-3 mile spacing using all available aircraft systems and navigational aids to monitor position.
- During climbs and descents, each aircraft/element will call passing each 5,000 foot altitude increment with altitude and heading (or heading passing) until joinup, level-off, or the following aircraft/element calls "tied."
- 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 immediately correct deviations from the planned route.
- Each aircraft/element will maintain at least 1,000 feet vertical separation from the preceding aircraft/element until establishing radar/visual contact, except in instances where departure instructions specifically preclude compliance. Reduce vertical separation to 500 feet if necessary to comply with MSA restrictions.
- In the event a visual joinup cannot be accomplished on top or at level-off, the flight leader will request altitude separation for each succeeding aircraft/element to meet the requirements of the above paragraph.

#### 4.3.3. Radar Contact.

- Each aircraft/element will call "tied" when radar contact is established with the preceding aircraft. Once all aircraft are tied, no further radio calls are required, except to acknowledge ATC instructions, unless radar contact is lost.
- In flights of three or more aircraft, use all available aircraft systems (ie. radar, TACAN, AAI, etc.) to ensure that trail is maintained on the correct aircraft.

#### 4.3.4. Trail Departures.

- Use a minimum of 20 seconds takeoff spacing.
- Each aircraft/element will accelerate in MIL/AB power until reaching 350 KIAS. Climb at 350 KIAS until reaching cruise mach/TAS, unless otherwise briefed.
- Upon reaching 350 KIAS, the flight leader will set 850 FTIT unless otherwise briefed.
- Limit all turns to a maximum of 30 degrees of bank.

#### 4.3.5. En route Trail. Flight leads must brief airspeeds, power settings, and configurations.

#### 4.3.6. Trail Recovery.

- Trail recoveries are only authorized at home station/deployed locations. Prior to their use, applicable ATC agencies must approve and local operating procedures must address trail recovery procedures. As a minimum, procedures must address each recovery profile, missed approach, climbout, lost contact, lost communications and desired/maximum spacing requirements.
- Limit trail recovery to a maximum of four aircraft.

- Trail recoveries are authorized when weather at the base of intended landing is at/above the highest pilot weather category in the flight or approach minimums, whichever is higher.
- *(ACC/ANG) Trail recoveries will not terminate in PAR or ASR approaches.*
- The flight lead must brief the flight on spacing, configuration, and airspeeds.
- The flight lead must coordinate the trail recovery with ATC prior to taking spacing.
- Prior to split-up, the flight lead must ensure that all wingmen have operative navigational aids and air-to-air radar.
- Accomplish flight separation IAW local directives and in VMC if possible.
- The formation must squawk as directed by ATC.
- ATC instructions to the lead aircraft will be for the entire flight. ATC will provide radar flight following for the entire formation.
- Limit all turns to a maximum of 30 degrees of bank.
- Once established on a segment of a published approach, each aircraft must comply with all published altitudes and restrictions while maintaining in-trail separation.
- Unless local procedures establish defined reference points for airspeed/configuration changes, the flight lead must direct changes by radio. At flight lead's call, all aircraft must simultaneously comply with the directed change.
- All aircraft must report the final approach fix.
- If contact is lost with the preceding aircraft, the pilot will transmit "C/S lost contact." The preceding aircraft will respond with altitude, airspeed and heading. Establish altitude deconfliction and coordinate a separate clearance with ATC. If contact is lost while established on a segment of a published approach, flight members may continue the approach, but must confirm separation via navigation aids. If separation cannot be confirmed, execute missed approach or climbout as instructed by ATC.

**4.4. Formation Break-up.** If possible, accomplish formation break-up in VMC. If IMC, accomplish the break-up in straight and level flight. Prior to a break-up in IMC, the flight leader must transmit attitude, airspeed, altitude, and altimeter setting which will be acknowledged by wingmen. Wingmen must confirm good navigational aids.

**4.5. Formation Penetration.**

- Restrict formation penetrations in route/close formation 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, as supplemented.
- If a formation landing is intended, position the wingman on the appropriate wing prior to weather penetration.
- Formation penetrations using radar trail procedures are authorized when weather at the base of intended landing is at/above the highest pilot weather category in the flight or approach minimums, whichever is higher.

**4.6. Formation Approach.** During IMC formation flights, do not change lead or wing positions below 1,500 feet AGL unless on RADAR downwind.

**4.7. Simulated Instrument Flight.** Simulated instrument flight requires a qualified safety observer in either cockpit of the aircraft or in a chase aircraft. Use all means to clear the area for hazards.

- A safety observer in the same aircraft must have an operable intercom.
- A chase aircraft is required in order to log simulated instrument flight in an F-15A/C. This does not preclude flying approaches in VMC without a chase, however, in this case place primary emphasis on the “See and Avoid” concept. Chase aircraft will be in a position where they can effectively clear and/or provide assistance. Chased instrument approaches may terminate in formation landings.

**4.8. Use of the Heads Up Display (HUD).** For the F-15A/B/C/D/E, use the HUD as an additional instrument reference not as the sole instrument reference. The HUD in the F-15E is the primary reference for low level/TF operations. Do not use the HUD to recover from an unusual attitude or when executing lost wingman procedures except when no other reference is available.

**4.9. Airborne Radar Approach (ARA).**

4.9.1. ARA Planning:

- Submit proposed ARAs to Air Force Flight Standards Agency (AFFSA) for approval.
- ARA minimums will be no lower than ASR or TACAN minimums, whichever is higher.

4.9.1.1. Fly ARAs in IMC only during an emergency or when the following conditions are met.

- The weather is at or above ARA minimums.
- The weather is at or above 1,500 feet and 3 miles visibility or ground radar traffic advisories are available and used during the approach or TACAN/ILS is operational and monitored by the pilot during the approach.

4.9.2. ARA Procedures:

- Obtain approval for the practice approach from the controlling agency prior to commencing the approach. The pilot will request IFR separation with radar flight following.
- Fly to intercept the penetration heading prior to the fix, with no more than a 60 degree turn to penetration heading. For F-15E, fly to intercept the penetration heading at an airspeed and with a radar squint angle that will allow HRM mapping of the runway environment.
- Begin the penetration when over the fix, descend and level off at the altitude specified for approach, or at 2,000 feet above the terrain, whichever is higher. If required to level-off at higher than 2,000 feet, continue to fly the altitudes specified for the approach.
- Identify the airfield using the ground map radar and steer to the runway. For F-15E, the WSO will provide steering to the pilot and monitor alignment by using the A/G radar and the designation capabilities of the F-15E.
- Approximately 10 miles from the runway, descend to 1,500 feet AGL or local pattern altitude as specified.
- At 5 miles from the runway, descend to the MDA, or local pattern altitude as specified. Descend so as to reach the MDA prior to the MAP.

- If required, fly the missed approach or climbout as directed/published.

**4.10. (ACC) Use of Electronic Attitude Director Indicator (EADI). F-15E aircrews will display an EADI in the following situations:**

- *Night TF loft recoveries.*
- *Unusual attitude recoveries.*
- *Lost wingman.*
- *Anytime the crew briefed maximum flight parameters are exceeded.*
- *During IMC or night flight except for TF operations or when the MPD/MPCD is momentarily used to view another display essential for mission accomplishment.*

## Chapter 5

### AIR-TO-AIR WEAPONS EMPLOYMENT

**5.1. References.** AFI 11-214 contains air-to-air procedures, to include operations with live ordnance applicable to all aircraft. This chapter specifies procedures or restrictions applicable to F-15/F-15E operations.

**5.2. Simulated Gun Employment.** Missions may be flown with a loaded gun provided the gun is safed IAW T.O. 1F-15C/E-34-1-1 CL-1 and a trigger check is first performed with the master arm switch in arm with Training Mode deselected. Point the aircraft away from other aircraft and inhabited areas during the trigger check. Do not perform a trigger check with a hot gun. If an aircraft is flown with a hot gun or live missiles, the procedures in AFI 11-214 apply.

**5.3. Maneuvering Limitations.**

5.3.1. Minimum airspeed during low altitude offensive or defensive maneuvering (LOWAT) is 350 KIAS.

5.3.2. When configured with three external wing tanks, aircraft will operate under the LIMITED maneuvering category as defined in AFI 11-214. When configured with external wing tanks and no centerline, UNLIMITED maneuvering is allowed once the externals are empty (flight manual restrictions still apply). The tank restriction does not apply to aerial gunnery tow aircraft. Tow aircraft may fly using any approved (for test and evaluation) or certified (operational) configurations.

5.3.3. Negative-G guns jinks are prohibited.

**5.3.4. (ACC) Minimum airspeed for F-15E ACBT is 150 KIAS. A "Knock-It-Off" is not normally required, however, at 150 KIAS, devote primary attention to regaining an adequate energy state.**

**5.3.5. (ACC/ANG) Minimum maneuvering airspeed during ACBT is 150 KIAS for students in IQT and instructors conducting the student training. A "Knock-It-Off" is not normally required, however, at 150 KIAS, devote primary attention to regaining an adequate energy state.**

**5.3.6. (ACC/ANG) When acting as a restricted maneuvering target for low altitude intercepts, the minimum airspeed is 300 KIAS.**

**5.3.7. (ACC/ANG) Air-to-air tactical maneuvering (ACBT and unlimited or limited maneuvering intercepts) is prohibited with a wing fuel imbalance greater than 600 pounds. If the imbalance can be corrected, the briefed mission can be continued.**

**5.4. Aerial Gunnery Tow Procedures.** AFI 11-214 applies. In addition:

5.4.1. AGTS-36 Target Set Deployment. Deploy the target set over areas clear of surface activity, near the range where shooting will occur. The tow will maintain 240 +/- 10 KIAS and ensure other flight members are clear during deployment. A chase aircraft will ensure that the AGTS-36 tow reel turbine doors open for deployment and the visual augments (VA) deploys properly. Any time the target set becomes unstable or flies erratic, the chase aircraft will advise the tow to cut the target loose.

5.4.2. AGTS-36 Target Set Reel-In. The tow will slow to 240 +/- 10 KIAS and initiate target set reel-in when shooting is complete. A chase will evaluate target set stability and advise the tow of any abnormalities. Recover target sets that have been hit if they do not exhibit abnormal flight characteristics. However, if a target set becomes unstable or flies erratic during reel-in, it should be cut loose. Initiate reel-in over areas clear of surface activity in anticipation of VA release. The chase will ensure the tow reel turbine doors are closed, the target set locks into place, the VA releases and perform a BDA on the tow after reel-in is complete.

#### 5.4.3. Abnormal Procedures.

- VA fails to deploy. Reel the target set back in and do not use for firing.
- VA fails to release after reel-in. The tow must recover using hung ordnance procedures.
- Erratic or unstable target set. In all cases where target sets exhibit unstable or erratic flight characteristics, the target set should be cut loose. Avoid trying to reel-in a target set that begins to become unstable/erratic, cut it free with whatever length of cable is present at the time it begins to fly abnormally.
- Target set shot off. Cut the remaining cable off. The cable may jam in the tow reel if reel-in is attempted without a target set present.
- Cutting target sets loose. Use primary and secondary cutters as the preferred means to cut target sets loose. If this is unsuccessful, reel out the target set until the cable/target set fall off. The next options depend on fuel availability, weather and resources. The tow may try to burn the cable off using afterburner and high AOA maneuvers. The target set may be drug off in the water. In this case, the chase will fly no lower than 1000 feet AGL and the tow no lower than 400 feet AGL. If all other means of cutting the target set loose are unsuccessful and the target set may not be safely recovered, jettison the AGTS-36 tow reel.
- Landing with cable remaining (no target set). The tow must recover using hung ordnance procedures. Plan the landing to avoid damage to runway approach lighting.

**5.5. (ACC/ANG) NORAD VID Procedures. Turn the HUD camera/VTR on during active air defense visual identification passes no later than 1 NM in the target's stern and leave it on until after completing the breakaway maneuver.**



## Chapter 6

### AIR-TO-SURFACE WEAPONS EMPLOYMENT (N/A ANG)

**6.1. References.** AFI 11-214 contains air-to-surface procedures applicable to all aircraft. This chapter specifies procedures or restrictions applicable to F-15E operations. Qualification and scoring criteria are contained in MCI 11-F15E Vol 1.

**6.2. Off-Range Attacks.** Restrictions in AFI 11-214 apply. Off range attacks may be conducted when carrying authorized practice ordnance provided:

- The training mode is used on the Programmable Armament Control Set (PACS).
- Stations with inert/training ordnance are not selected on the PACS.

**6.3. Weather Minimums.** Basic weather minimums established in AFI 11-214 apply. A minimum ceiling of 2,000 feet AGL is required for climbing or diving deliveries and 1,500 feet AGL for level deliveries.

**6.4. Pop-Up Attacks.** Abort pop-up attacks if airspeed decreases below 350 KIAS (300 KIAS above 10,000 feet AGL).

**6.5. Night Surface Attack Procedures.** All procedures in AFI 11-214 apply.

- For weapons deliveries at night, the weather must allow the RCO (class A range) or a flight member/range personnel (class B or C range) to clear the target area and spot/score the ordnance impact.
- Multiple weapons deliveries may be accomplished at night and/or during IMC, if range patterns and procedures which ensure positive aircraft separation are established and briefed. When accomplishing multiple deliveries, fly the downwind using TFR or at MSA or above, range restrictions permitting. If the downwind is flown at MSA or above, do not begin a TFR descent to the planned delivery altitude until in a position to remain within TF limits.

**6.6. LANTIRN Weapons Delivery.** Deliveries will normally be radar designated with a sensor hand-off to the IR system or visual release for final designation. Direct attack deliveries may be flown as a back-up profile. Auto or CDIP visual designations with the NAV FLIR may be used for weapon release.

**6.7. LANTIRN Pattern Procedures.**

- When using TF while performing weapons deliveries on a range, all maneuvering in the bombing pattern below MSA will be inside TF limits.
- Minimum pattern altitude for night non-TFR deliveries is MSA.
- Maximum angle of bank during night LANTIRN recovery maneuvers (from loft or climbing safe escape) is 135 degrees.

**6.8. Loft Recovery Procedures.**

6.8.1. Escape maneuvers following loft deliveries are instrument recoveries which exceed numerous TF limits. Use the following procedures to manually recover to within TF limits:

- Recovery Initiation Altitude (RIA) is the sum of the escape corridor MSA and altitude lost during the dive recovery. Compute RIA for the planned escape corridor. The escape corridor is defined as a

10NM wide corridor, starting at the planned roll out point and extending for 8NM along the egress heading. The MSA is 1,000 feet above the highest obstacle within the corridor, rounded up to the nearest 100 feet.

- Following release, roll to 120-135 degrees of bank and execute a 4-5G slicing turn. As the nose passes the horizon, decrease bank angle to 90 degrees and continue to decrease bank angle to keep the nose from dropping lower than 10 degrees nose low. Roll out on egress heading or upon reaching 10 degrees nose low and follow TF steering when it appears. If approaching RIA before rolling out, or before TF steering appears, pull to recover at or above MSA.

6.8.2. Prior to loft deliveries, aircrews must select an EADI and verify accuracy of the standby ADI.

6.8.3. If the TF system fails during recovery, maintain the appropriate minimum altitude (RAA/MSA) that provides terrain clearance.

6.8.4. Abort Criteria. If at any time during a low altitude, nose-high LANTIRN weapons delivery (loft) or recovery, airspeed drops below 300 KIAS, abort the maneuver and recover. Direct primary emphasis towards aircraft attitude, altitude and regaining airspeed.

## Chapter 7

### ABNORMAL OPERATING PROCEDURES

**7.1. General.** Follow the procedures in this chapter when other than normal circumstances occur. These procedures do not supersede flight manual guidance.

7.1.1. Do not accept an aircraft for flight with a malfunction addressed in the emergency/abnormal procedures section of the flight manual until it has been corrected.

7.1.2. Do not use a malfunctioning system unless it is required for safe recovery of the aircraft. Do not continue in-flight troubleshooting a malfunction after completing flight manual emergency procedures and the aircraft may be safely recovered.

7.1.3. Only conduct fuel dumping to reduce aircraft gross weight for safety of flight. When circumstances permit, dump above 5,000 feet AGL over unpopulated areas. Ensure the dump switch is returned to normal before landing. Make the appropriate entry in the AFTO Form 781.

7.1.4. Do not taxi aircraft with malfunctions that effect the nosewheel steering or brake system.

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

7.2.1. If a flight member aborts prior to takeoff, the flight leader will normally renumber the flight. Flight leaders must advise the appropriate agencies of such changes.

7.2.2. In the event of an abort, formation flight may only continue if it is led by a qualified flight lead. The alternatives are a sympathetic abort or proceeding on a pre-briefed single-ship mission.

7.2.3. Delayed aircraft may join the flight at a briefed rendezvous point or may fly a briefed alternate single ship mission. If accomplishing a joinup, cease tactical maneuvering until the delayed aircraft is joined and all aircrews are ready to continue.

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

7.3.1. If aborting the takeoff, 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 cable engagement, clear straight ahead. As soon as practical, give callsign and state intentions. Call "Cable, Cable, Cable" to indicate a departure-end arrestment. Following aircraft hold their position, abort or takeoff as appropriate to maintain adequate clearance.

7.3.2. When applying the brakes above 120 KIAS during a takeoff abort, or hot brakes are suspected; declare a ground emergency, taxi the aircraft to the designated hot brake area, and follow hot brake procedures.

**7.3.3. (ACC/ANG) *If aborting a takeoff at or above 100 KIAS, lower the tailhook. If aborting below 100 KIAS, lower the tailhook if there is any doubt about the ability to stop on the runway.***

#### **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. Escort aborting aircraft with an emergency to the field of intended landing. In other cases, the flight leader will determine if an escort is required.

7.4.3. Abort the mission and land out of a straight-in approach, regardless of apparent damage or subsequent normal operation, for any of the following:

- Birdstrike/Foreign Object Damage.
- \*Over-G (**F-15E only**).
- Flight control system anomalies. This does not include flight control system lights that reset IAW flight manual procedures.
- Engine flameout, stagnation or shutdown.

7.4.4. If an aircraft experiences an over-G, use the following procedures:

7.4.4.1. Non-OWS equipped aircraft and OWS equipped aircraft whose OWS is not operational.

- Terminate the mission and land as soon as practical from a straight-in approach.

7.4.4.2. Aircraft equipped with an operable OWS system that experiences an over-G.

\*7.4.4.2.1. (**F-15E Only**) Immediately terminate maneuvering and call up the OWS matrix on the VSD to analyze the displayed parameters.

\*7.4.4.2.1.1. (**F-15E Only**) If level "1" (one) or greater is displayed in any column of the matrix, terminate the mission and fly a straight-in approach.

\*7.4.4.2.2. (**F-15A/B/C/D Only**) Immediately terminate maneuvering and call up the OWS matrix on the VSD to analyze the displayed parameters.

\*7.4.4.2.2.1. (**F-15A/B/C/D Only**) If level "1" (one) is displayed in any column of the matrix except mass items (MIT), perform a battle damage check with emphasis on the overall condition of the aircraft. If no abnormalities are noted, the flight lead may continue the briefed mission. If a subsequent level "1" or greater over-G occurs, terminate the mission, perform a battle damage check, RTB and fly a straight-in approach, except as noted below.

\*7.4.4.2.2.2. (**F-15A/B/C/D Only**) If level "1" (one) or greater is displayed in the MIT column, terminate the mission, perform a battle damage check, RTB and fly a straight-in approach.

\*7.4.4.2.2.3. (**F-15A/B/C/D Only**) If level "2" (two) or greater is displayed in any column of the matrix, terminate the mission, perform a battle damage check, RTB and fly a straight-in approach.

7.4.4.3. Document actual over-Gs (level 1 or greater) in the AFTO Form 781 after flight.

7.4.5. In the F-15B/D/E, the pilot in command is primarily responsible for handling in-flight emergencies. The additional aircrew member will provide checklist assistance at the request of the pilot in command.

**7.5. Engine Malfunctions.** Report all engine anomalies during maintenance debriefing.

## **7.6. Radio Failure:**

7.6.1. General. Individual aircraft experiencing radio failure will comply with procedures outlined in FLIP, AFI 11-206, this instruction, and local directives.

7.6.2. Formation:

7.6.2.1. 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 considerations dictate otherwise.

7.6.2.2. If flying other than close/route formation when radio failure occurs, the NORDO aircraft should attempt to rejoin to a route position at approximately 500 feet on another flight member. The NORDO aircraft is responsible for maintaining clearances from other flight members until his presence is acknowledged by a wingrock, signifying clearance to join. Once joined, the NORDO aircraft will give the appropriate visual signals. If pre-briefed, 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. Aircraft experiencing any difficulty/emergency in addition to NORDO will proceed as required by the situation.

#### 7.6.3. Surface Attack NORDO Procedures:

##### 7.6.3.1. Manned Ranges.

- Attempt contact with the Range Control Officer (RCO) on the appropriate back-up frequency.
- If unable to 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 the flight 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 suitable recovery base. The flight leader will direct a flight member to joinup and escort the emergency aircraft.

##### 7.6.3.2. Unmanned Ranges.

- Make a pass over 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. A NORDO with an emergency, if practical, should make a pass over the target, rocking wings, turn opposite direction of traffic, and proceed to a recovery base. The flight leader will direct a flight member to joinup and escort the emergency aircraft.

7.6.3.3. If radio failure occurs and circumstances preclude landing with unexpended ordnance, accomplish a safe jettison of the ordnance provided the following conditions are met:

- The NORDO aircraft joins on another flight member which 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.

#### 7.6.4. Aerial Gunnery/Missile Firing NORDO Procedures:

- Aircraft will not fire without two-way radio contact.
- Shooting aircraft: safe the armament switches, join on another member of the flight or the tow aircraft, IAW para 7.6.2.
- Aerial gunnery tow aircraft: rock wings and continue the turn if an attack is in progress. The flight leader of the attacking aircraft will “knock off” the attack and join on the tow's wing, remaining clear of the target in the event it is cut. The tow pilot will use standard hand signals to indicate his difficulty. The flight leader will signal when the target is cleared for cut with a slicing motion across the throat. After the target is away and the flight lead determines there is no remaining cable, the tow

will RTB with an escort following the briefed NORDO recovery procedures. If cable remains, follow local procedures.

#### 7.6.5. NORDO Recovery:

- Apply the procedures in AFI 11-205 and FLIP.
- If a formation straight-in approach is flown 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.
- A NORDO aircraft intending to make an approach-end cable engagement should signal the escorting aircraft by extending the tailhook. If the NORDO aircraft is not escorted, the pilot should fly a straight-in approach flashing the landing light on final to signal the tower.

**7.7. Severe Weather Penetration.** Avoid flight through severe weather. If unavoidable, flights should break-up and obtain separate clearances prior to severe weather penetration.

**7.8. 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 the wingman will simultaneously:

- Execute the applicable lost wingman procedures. Refer to para 7.9 for specific spatial disorientation (SD) considerations. Smooth application of control inputs is imperative to minimize the effects of SD.
- Transition to primary flight instruments.
- Inform lead by transmitting "C/S is lost wingman."
- After executing a lost wingman procedure, do not attempt rejoining with the flight until obtaining permission from the flight lead.
- When able, obtain a separate clearance.
- Observe all published terrain clearance limits.

#### 7.8.1. Two- or Three-Ship Flights (for three-ship echelon, refer to four-ship procedures):

7.8.1.1. Wings-level flight (climbing, descending, or straight and level): Turn away using 15 degrees of bank for 15 seconds, then resume original heading.

#### 7.8.1.2. Turns:

- Outside the Turn. Reverse the direction of turn using 15 degrees of bank for 15 seconds. Continue straight ahead to ensure separation prior to resuming the turn.
- Inside the Turn. Momentarily reduce power to ensure nose-tail separation and direct the flight leader to roll out of the turn. Maintain the original turn. The leader may only resume the turn when separation is ensured.

7.8.1.3. Final Approach. Momentarily turn away from lead to ensure clearance and execute the published missed approach procedure.

7.8.1.4. Missed Approach. Momentarily turn away from lead to ensure clearance and continue the published or assigned missed approach procedure. Climb to 500 feet above missed approach altitude.

7.8.2. Four-Ship Flights. Number 2 and 3 follow the procedures outlined above. Number 4's initial action assumes that number 3 has also gone lost wingman. In addition to paragraph 7.8, number 4 will:

7.8.2.1. Wings-Level Flight (climbing, descending, or straight and level). Turn away using 30 degrees of bank for 30 seconds, then resume the original heading.

7.8.2.2. Turns:

- Outside the Turn. Reverse direction of turn using 30 degrees of bank for 30 seconds to ensure separation from lead and number 3.
- Inside the Turn. Momentarily reduce power to ensure nose-tail separation and increase bank angle by 15 degrees. Direct the leader to roll out. The leader will only resume the turn when separation is ensured.

7.8.3. Leader must acknowledge the lost wingman's radio call and, when appropriate, transmit attitude, heading, altitude, airspeed, and other parameters.

7.8.4. 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 NORMAL code 7600 while proceeding with previous clearance. If an emergency situation arises along with radio failure, turn the IFF/SIF to EMERGENCY for the remainder of the flight.

7.8.5. Only practice lost wingman procedures in VMC.

**7.9. Spatial Disorientation (SD).** Conditions which prevent a clear visual horizon or increase pilot tasking are conducive to SD. To prevent SD, the pilot must increase his instrument cross-check rate. If SD symptoms are encountered:

7.9.1. Single Ship:

- Concentrate on flying basic instruments with frequent reference to the attitude indicator. Use heads-down instruments. If flying dual, consider transferring control to the other crewmember.
- If symptoms persist and conditions permit, fly straight and level flight until symptoms abate, usually within 60 seconds. Consider using the autopilot.
- If necessary, declare an emergency and advise ATC.
- NOTE: It is possible for SD to proceed to the point where the aircrew is unable to see or interpret the flight instruments. In this situation, aircraft control may be impossible. If this occurs, the aircrew should consider ejecting.

7.9.2. Formation Lead:

- Advise the wingmen that he has SD and comply with procedures in paragraph 7.9.1.
- Use the wingmen to confirm attitude and provide verbal feedback.
- If symptoms persist, terminate the mission and recover the flight by the simplest and safest means possible.

7.9.3. Formation Wingman:

- Advise lead of the disorientation.

- Lead will advise wingman of aircraft attitude, altitude, heading, and airspeed.
- If symptoms persist and conditions permit, lead will establish straight and level flight for 30-60 seconds
- If the above procedures are not effective, lead should consider passing the lead to the wingman, provided the leader will be able to maintain situational 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.

7.9.4. Greater than 2-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 Break-up). Plan to keep the element with the SD pilot straight and level while the other element separates.

### **7.10. Armament System Malfunctions.**

#### 7.10.1. Inadvertent Release.

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

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

#### 7.10.2.1. Hung live ordnance or aircraft malfunction which precludes further live weapons delivery.

- Attempt to release store(s) using an alternate delivery mode. (N/A for A/A WSEP) If unsuccessful, attempt to jettison store(s) using selective jettison procedures. Lastly, consider attempting to selectively jettison the rack if ordnance is unsecure or security cannot be determined.
- All release and fuzing switches should be noted then safed.
- If ordnance remains on the aircraft, follow the hung ordnance recovery procedures.

#### 7.10.2.2. Practice/Inert Ordnance:

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



#### 7.10.3. Hangfire/Misfire:

- A missile that fires but fails to depart the aircraft is a hangfire. If this occurs, the missile should be closely observed and safety checked by a chase pilot.
- 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.

7.10.3.1. MAVERICK Misfire. When a misfire occurs, safe the Master Arm switch and have the missile visually checked for smoke or fire. If either exists, jettison the missile on the range. If neither is noted, another pass may be attempted. If the second attempt fails, either remain dry in the pattern for 15 minutes or proceed to the recovery base following hung ordnance recovery procedures.

#### 7.10.4. Hung Ordnance/Weapons Malfunction Recovery:

- If practical, visually inspect the aircraft for damage.
- Declare an emergency for hung live ordnance (not required for hung practice/inert ordnance or for live unexpended ordnance).
- If available, obtain a chase aircraft (N/A at night) and avoid populated areas and trail formations.
- Land from a straight-in approach.

#### 7.10.5. 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, visually inspect the launching aircraft by another pilot (if possible) to determine if any damage has occurred.

### **7.11. Post Arresting Gear Engagement Procedures.**

- Do not shut down the engine(s) unless directed by the ground crew, there is a fire or other conditions dictate.
- Raise the tailhook on the ground crew's signal.
- Do not taxi until directed.
- Comply with local directives.

### **7.12. In-flight Practice of Emergency Procedures.**

7.12.1. Simulated Emergency Procedure. Any procedure that produces an effect which closely parallels an actual emergency, such as retarding the throttle to simulate the drag equivalent to a flamed out engine.

7.12.2. Aborted Takeoff Practice. Only practice aborted takeoffs in the flight simulator, Cockpit Procedures Trainer (CPT), or, if the trainer is unavailable, a static aircraft.

7.12.3. Simulated in-flight loss of both engines is prohibited.

7.12.4. Practice in-flight engine shutdown is prohibited.

7.12.5. Emergency Landing Patterns (Refer to AFI 11-206).

7.12.5.1. Field Requirements. Practice of emergency landing patterns at active airfields is authorized provided that crash rescue and air traffic control facilities are available and in operation.

7.12.5.2. Supervisory Requirements. IQT (including FTU) pilots require an IP on board the aircraft or in a chase aircraft. MQT (including FTU) pilots require a SOF in place and an IP or flight lead monitoring from the traffic pattern.

7.12.5.3. Pattern Procedures:

- Include the type of practice emergency pattern in the gear check call.
- Initiate practice single-engine go-arounds in sufficient time to ensure the aircraft does not descend below 300 feet AGL. Simulated single-engine approaches may descend below 300 feet AGL provided the approach terminates in a full stop landing or the go-around from a low approach or touch and go landing is performed with both engines. When conducting such training, the pilot will advise the appropriate air traffic controller of his intentions.

**7.13. Search and Rescue (SARCAP) Procedures.** If an aircraft crashes, immediately attempt to locate possible survivors and initiate rescue efforts. Expect that the aircrews may initially suffer from shock or have delayed reactions due to ejection injuries. The following procedures are by no means complete and should be adjusted to meet each unique search and rescue situation.

- Knock off maneuvering.
- Establish a SARCAP commander.
- Squawk 7700 to alert ATC/GCI of the emergency situation.
- Communicate the emergency situation and aircraft/flight intentions immediately to applicable control agencies. Use GUARD frequency if necessary.
- Mark the last known position of survivors/crash site using any means available (TACAN, INS, ATC/GCI position and/or visual references).
- Remain above the highest ejection altitude, if known, or the highest observed parachute until determining the position of all possible survivors.
- Deconflict other aircraft assisting in the SARCAP by altitude to preclude midair collision. Establish high/low CAPs as necessary to facilitate communications.
- Revise BINGO fuels or recovery bases as required to maintain maximum SARCAP coverage. Do not overfly the adjusted BINGO fuel.
- Relinquish SARCAP operation to designated rescue forces upon their arrival.
- Follow local or briefed procedures.

**7.14. Lateral Asymmetry.** When the aircraft exceeds lateral asymmetries which preclude maneuvering above the flight manual 30 unit AOA restriction, limit airspeed to a minimum of 300 knots indicated, except during maximum range descents, holding, instrument approaches and landing. This airspeed limitation will not prevent the aircraft from exceeding the 30 unit AOA restriction at all gross weights and altitudes, but will help to reduce the potential for aircraft departures resulting from lateral asymmetry.

## 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 instruction, nor is this chapter 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 F-15/F-15E crewmember. MAJCOMs or other subordinate agencies (NAF, Center, etc.), may direct publications approval channels and a specific format for Chapter 8 based on unique flying areas, missions, and/or procedures. Unless changed by MAJCOM or subordinate agency, the following procedures apply.

8.1.1. When published, units will forward copies to MAJCOM and appropriate subordinate agencies, who will review the Chapter 8 and return comments or 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 is applicable to all F-15/F-15E units, it will be incorporated into the basic instruction.

8.1.2. Organize the local chapter in the following format and, as a minimum, include 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)

8.1.3. Include procedures for the following, if applicable:

- Command and Control.
- Fuel Requirements and Bingo Fuels.
- Diversion Instructions.
- Jettison Areas/Procedures/Parameters (IFR/VFR).
- Controlled Bailout Areas.
- Local Weather Procedures.
- Unit Standards (Optional).
- Approved Alternate Missions.
- Cross-Country Procedures (if applicable).
- Search and Rescue (SARCAP) Procedures.

**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.

**Attachment 1**  
**GENERAL BRIEFING GUIDE**

**MISSION DATA**

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. Weather/Sunrise/Sunset/Moon Illumination
7. Tactical Decision Aid (LANTIRN)
  - a. Transmissivity/Absolute Humidity
8. NOTAMs/Bird Strike Potential
9. Personal Equipment
10. FCIF/Pubs/Maps

**GROUND PROCEDURES**

1. Pre-Flight
  - a. Aircraft
  - b. Armament
2. FLIR Tuning/Boresighting (LANTIRN)
3. Check-In
4. Taxi/Marshaling/Arming
5. Spare Procedures

**TAKEOFF**

1. Runway Lineup
2. Formation Takeoff/Takeoff Interval
3. Abort
4. Jettison Procedures
5. Low Altitude Ejection

6. Landing Immediately After Takeoff

**DEPARTURE/EN ROUTE**

1. Routing
2. Trail Departure
3. Join-Up/Formation
4. Systems/Ops Checks
5. TFR Checks

**RECOVERY**

1. Rejoin
2. Battle Damage/Bomb Check
3. Type Recovery
4. Flight Break-Up
5. Pattern and Landing
6. After Landing/De-Arm
7. Emergency/Alternate Airfields

**Attachment 2**  
**SPECIAL SUBJECT BRIEFING GUIDE**  
(as applicable)

1. Instructor Responsibilities
2. Chase Procedures
3. IFF Procedures
4. Radar/Visual Search Responsibilities/Midair Collision Avoidance
5. Dissimilar Formations
6. Terrain Avoidance
  - a. Departure/En Route/Recovery
  - b. Use of Radar Altimeters/MSL Floor Settings
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. G-Suit connection/G-tolerance/G-Awareness Turn
  - b. Use of L-1 Anti-G Straining Maneuver (AGSM)
10. Visual Illusions/Perceptions
11. Spatial Disorientation/Unusual Attitudes
12. Lost Wingman
13. Radio Inoperative
14. SARCAP
15. Recall Procedures
16. SIIs

**Attachment 3**  
**ADVANCED HANDLING/INSTRUMENT BRIEFING GUIDE**

**AIRWORK**

1. Airspace Restrictions
2. Area Orientation
3. Instructor Responsibilities
4. Maneuvers

**APPROACHES**

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

**SPECIAL SUBJECTS**

1. "G" Awareness
2. Fuel Awareness/AB Use/Consumption Rates
3. Maneuvering Limitations
  - a. Airspeed and "G"
  - b. Recognition/Prevention/Recovery From Out of Control
  - c. Maneuvering at Heavyweight/High Angles of Attack/Asymmetrical Configuration
  - d. Effects of CG Throughout the Flight
  - e. Time to Ground Impact
    - (1) Wings Level
    - (2) Overbank/Under G
4. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)



**Attachment 4**  
**AIR REFUELING BRIEFING GUIDE**

**GENERAL**

1. Tanker Call Sign(s)/Receiver Assignments
2. Refueling Track(s)
  - a. Altitude
  - b. Airspeed
  - c. Airspace Restrictions
3. ARIPs, ARCPs, ARCTs
4. Radio Frequencies

**BUDDY PROCEDURES**

1. Departure
2. Join-Up

**EN ROUTE**

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

**RENDEZVOUS**

1. Type Rendezvous
2. Holding Procedures/Formation
3. Ground Radar Assistance
4. Tanker Identification - TACAN/Radar/AAI/Visual
5. Radar Procedures/Techniques
6. Wingman/Deputy Lead Responsibilities
7. Receiver Formation/Join-Up Procedures
8. Rendezvous Overrun

**REFUELING**

1. Checklist Procedures
2. Radio Calls
3. Refueling Order

4. Techniques
5. Radio Silent Procedures
  - a. EMCON
  - b. Visual Signals
6. Fuel Off-Load
7. Bingo Fuel (Abort Points/Abort Bases)
8. Drop-Off Procedures
9. Wake Turbulence

#### **REFORM AND EXIT**

1. Formation
2. Clearance

#### **EMERGENCY PROCEDURES**

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

#### **IMC/NIGHT CONSIDERATIONS**

1. Lost Wingman Procedures
2. Aircraft Lighting

#### **SPECIAL SUBJECTS**

1. Fuel Awareness/AB Use/Consumption Rates
2. Flight Path Deconfliction/Other Receiver Considerations
3. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)

**Attachment 5**  
**AIR COMBAT TRAINING (ACBT) / INTERCEPT BRIEFING GUIDE**

**GENERAL/ADVERSARY COORDINATION/GCI COORDINATION**

1. Call Signs
2. Number and Type Aircraft
3. Scenario
  - a. Objective(s)
  - b. Type Threat Simulated/Tactics Limitations (If Any)
  - c. CAP Points/Target Locations
  - d. Safe Areas/FEBA/Ground Threats
  - e. VID/EID/BVR Criteria
4. Mission Contingencies
  - a. Single Radar Scope/No GCI
  - b. Single Frequency
  - c. Area Weather/Alternate Mission
  - d. Minimum Participants (Primary/Alternate Missions)
5. Area Information
  - a. Controlling Agency (GCI/AWACS/ACMI)
    - (1) GCI/Flight
    - (2) Comm Requirements
    - (3) Type/Level of Control
  - b. Airspace Restrictions
  - c. CAP Points/Target Locations
  - d. Frequencies
  - e. Squawks
  - f. Block Altitudes/Min Altitudes/Flight Parameters
  - g. Transmissions
    - (1) KIO
    - (2) Shots/Kills
    - (3) Fuel/Altitude Awareness
6. Rendezvous/Recovery Procedures
  - a. Dissimilar Formation
7. Weapons Employment
  - a. Simulated Ordnance (Type/Quantity)
  - b. Shot Criteria
  - c. Kill Criteria/Removal
  - d. Shot/Kill Passage
8. Training Rules
9. Emergency Procedures
  - a. Recovery
  - b. Escort Procedures
10. Debriefing (Time/Place)

**FLIGHT/ELEMENT TACTICS**

1. Avionics Set-up
  - a. Radar
  - b. INS
  - c. IFF
  - d. Air-to-air TACAN
  
2. CAP/Patrol Phase
  - a. Type Pattern
  - b. Formation/Altitude/Airspeed
  - c. Search Responsibilities
  - d. Commit
    - (1) Criteria/Range
    - (2) Procedures
  
3. Ingress/Intercept Phase
  - a. Formation/Altitude/Airspeed
  - b. Detection
    - (1) Search Responsibilities (Radar/Visual)
    - (2) Radar Sorting
  - c. Targeting Plan
  - d. Intercept Type/Planned Tactics
    - (1) Plan (Direct Attack/Deception)
    - (2) Mutual Support Requirements
    - (3) Identification Requirements/Procedures
    - (4) Minimum Altitudes/Airspeeds
    - (5) Vertical/Horizontal Conversions/Turning Room
  - e. Night/IMC Intercepts
    - (1) ECM/Chaff/ Evasion Restrictions
    - (2) Radar Requirements
    - (3) Altitude Separation Requirements
  
4. Engagement Phase
  - a. Plan
    - (1) Turn and Fight
    - (2) Hit and Run
    - (3) Abort
  - b. Clearance for Wingman to Engage
    - (1) Offensive
    - (2) Defensive
  - c. Alternate Plan (Degraded Situation)
  
5. Egress/Separation Phase
  - a. Disengagement Plan (Why/When/How)
    - (1) Loss of Mutual Support
    - (2) Fuel
    - (3) Ordnance
  - b. Egress Formation/Responsibilities
  
6. Contingencies
  - a. Single Contact
  - b. Short Range Commit
  - c. Single Ship (Loss of Mutual Support)
  - d. Safe Escape/Rendezvous Point
  
7. Live Missile/Hot Gun Safety Procedures

8. Additional Considerations
  - a. Threat Reaction
  - b. Degraded Systems
  - c. Tactical Lead Changes
  - d. Bandit Options
  - e. Film/VTR
  - f. Codewords
  - g. Environmental Considerations
  
9. Alternate Mission
  - a. Type Mission (refer to appropriate mission briefing guide)
  - b. Mission Objectives

**SPECIAL SUBJECTS**

1. "G" Awareness
  
2. Fuel Awareness/AB Use/Consumption Rates
  
3. Flight Path Deconfliction
  
4. Maneuvering Limitations
  - a. Airspeed and "G"
  - b. Recognition/Prevention/Recovery from Out of Control
  - c. Time to Ground Impact
    - (1) Wings Level
    - (2) Overbank/Under "G"
  
5. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)

**Attachment 6**  
**ESCORT MISSION BRIEFING GUIDE**

**EN ROUTE TO RENDEZVOUS/POST-MISSION NAVIGATION**

1. Formation
2. Route of Flight
3. Control Agency Call Sign/Frequency

**RENDEZVOUS**

1. Protected Force Call Sign
2. Altitude
3. Airspeed

**ESCORT PROCEDURES**

1. Type Formation
2. Tactics
3. Commit
  - a. Criteria/Range
  - b. Procedures
4. Escort Route
5. ECM/RWR

**TRAINING RULES**

**ALTERNATE MISSION**

1. Type Mission (refer to appropriate mission briefing guide)
2. Mission Objectives

**SPECIAL SUBJECTS**

1. Airspace Restrictions
2. "G" Awareness
3. Fuel Awareness/AB Use/Consumption Rate
4. Flight Path Deconfliction
5. Maneuvering Limitations
  - a. Airspeed and "G"
  - b. Recognition/Prevention/Recovery from Out of Control

6. Time to Ground Impact

- a. Wing Level
- b. Overbank/Under "G"

7. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)

**Attachment 7**  
**AERIAL GUNNERY TOW COORDINATION BRIEFING GUIDE**

**TOW COORDINATION**

1. Ground/T.O./Departure
2. Rendezvous
3. Airspace Data
4. GCI Support
5. Target Launch/Chase
6. Shooter Order
7. Type Pattern
8. Tow Altitude Block(s)/Flight Parameters
9. Intercept Phase/Pattern Set-Up
10. Arming Procedures
11. Timing
12. Tow Maneuvering Parameters
13. Shooter/Firing Plan
14. Radio Procedures
15. Termination
  - a. Timing
  - b. Minimum Altitude
  - c. Joker/Bingo Fuel
  - d. Winchester
  - e. Fouls
16. Armament Safety Check
17. Scoring
18. Subsequent Set-Ups
19. Target Drop Procedures
20. Recovery Order
21. Abnormal Procedures
  - a. Erratic Target
    - (1) During Deployment
    - (2) During Employment
  - b. Target Drag-Off
  - c. Recovery With Target/Cable



d. NORDO

- (1) During Engagement
- (2) Target Drop
- (3) Visual Signals
- (4) Recovery

**Attachment 8**  
**AERIAL GUNNERY BRIEFING GUIDE**

**GENERAL**

1. Formation
2. Area Information
  - a. Controlling Agency
  - b. Airspace Restrictions
  - c. Frequencies
3. Switch Positions
4. Arming Procedures
5. Intercept / Set-Up
6. Shooter Sequence
7. Position Changes
8. Chase Procedures
9. Timing

**EMPLOYMENT**

1. Firing Parameters
  - a. Minimum Range
  - b. Overtake
  - c. Angle-Off
  - d. Error Analysis
2. Contingencies
  - a. Avionics Malfunctions
  - b. Gun Malfunctions
  - c. Range Estimation Without Radar
3. Safety Considerations
  - a. Target Fixation
  - b. Debris Avoidance
  - c. Fouls

**TRAINING RULES/SPECIAL OPERATING INSTRUCTIONS**

**ALTERNATE MISSION**

1. Type Mission (refer to appropriate mission briefing guide)
2. Mission Objectives

**SPECIAL SUBJECTS**

1. Minimum Altitudes

2. "G" Awareness
3. Fuel Awareness/Ops Checks/AB Use/Consumption Rates
4. Maneuvering Limitations
  - a. Airspeed/"G"/Stress
  - b. Recognition/Prevention/Recovery From Out of Control
5. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)

**Attachment 9**  
**LOW-LEVEL NAVIGATION BRIEFING GUIDE**

**GENERAL**

1. Route/Clearance/Restrictions
2. Flight Responsibilities
  - a. Navigation
  - b. Radar/Visual Search
3. Entry/Spacing /Holding/Initial Altitude (MSA)

**ROUTE PROCEDURES**

1. Fence Checks
2. Tactical Formation/Turns
3. Low-Level Navigation
  - a. Dead Reckoning/Use of Navigation Aids/ Equipment (i.e. INS/TSD)
  - b. Radar Procedures/Techniques/Predictions
  - c. Visual Procedures/Techniques/IR Predictions
  - d. Updates/Calibrations
  - e. Time/Fuel Control
  - f. Terrain Following/Avoidance/Wingman Considerations
  - g. Leg Altitudes/Set Clearance Plane/Obstacles (MSL/AGL)
  - h. Turnpoint Acquisition
4. Threat Reactions
  - a. RWR/ECM/CHAFF/FLARES
  - b. Engagement Criteria
  - c. Flight Path Deconfliction
  - d. Termination

**EMERGENCIES**

1. Aircraft Malfunctions
2. Route Abort Procedures (RAA/MSA)/ATC Frequencies

**TRAINING RULES/SPECIAL OPERATING INSTRUCTIONS**

**ALTERNATE MISSION**

1. Type mission (refer to appropriate mission briefing guide)
2. Mission Objectives

**SPECIAL SUBJECTS**

1. Airspace Restrictions
2. "G" Awareness/Ops Checks
3. Fuel Awareness/AB Use/Consumption Rates

4. Flight Path Deconfliction
5. Maneuvering Limitations
  - a. Airspeed and "G"
  - b. Recognition/Prevention/Recovery From Out of Control
6. Time to Ground Impact
  - a. Wings Level
  - b. Overbank/Under "G"
7. Night Considerations
8. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)

**Attachment 10**  
**AIR-TO-SURFACE WEAPONS EMPLOYMENT BRIEFING GUIDE**

**RANGE MISSION**

**RANGE INFORMATION**

1. Target/Range Description
2. Restrictions
3. Range Entry/Holding
4. Radio Procedures
5. Formation
6. Sequence of Events
7. Pattern Procedures
8. Aircraft fallout plan
9. Rejoin on range for late takeoffs

**EMPLOYMENT PROCEDURES/TECHNIQUES**

1. Avionics/Switch Positions
  - a. Weapons Switchology/Delivery Mode
  - b. Radar Switchology
  - c. Special Weapons Switchology
2. Laydown/Loft Events
  - a. Ground track/Altitude/Airspeed
  - b. Radar/Optical Depiction (OAP/TGT)
  - c. Radar/Optical Tuning/Techniques
  - d. Pickle/Release Point
  - e. Breakaway/Recovery Technique
  - f. Backup Deliveries/EMR
  - g. Delivery Spacing
3. 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
4. Roll-In
  - a. Position
  - b. Techniques (Pitch/Bank/Power)
  - c. Roll-Out/Wind Effect
5. Final
  - a. Aim-Off Distance
  - b. Dive Angle

- c. Airspeed
- d. HUD Depiction
- e. Sight Picture/Corrections/Aim-Point
- f. Release Parameters
- g. Release Indications
- h. Recovery Procedures

### **SPECIAL PROCEDURES**

- 1. Live Ordnance Considerations
  - a. Safe Escape/Safe Separation
  - b. Fuse Arming/Frag Avoidance
- 2. RBS Operations
- 3. Laser Operations

### **NIGHT PROCEDURES**

- 1. Aircraft Lighting
- 2. Radio Calls
- 3. Target ID/Range Lighting
- 4. Night Spacing Techniques
- 5. Instrument Cross-check/Disorientation

### **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 PROCEDURES**

- 1. Armament Safety Checks
- 2. Rejoin
- 3. Battle Damage/Bomb Check
- 4. Jettison Procedures/Parameters
- 5. Hung/Unexpended Ordnance
- 6. Inadvertent Release

7. Gun Unsafe/Jam

## **TRAINING RULES/SPECIAL OPERATIONS INSTRUCTIONS**

### **ALTERNATE MISSION**

1. Type Mission (refer to appropriate mission briefing guide)
2. Mission Objectives

### **SPECIAL SUBJECTS**

1. Error Analysis
2. Fouls
3. Minimum Altitudes
4. Target Fixation
5. "G" Awareness
6. Fuel Awareness/Ops Checks/AB Use/Consumption Rates
7. Maneuvering Limitations
  - a. Airspeed/"G"/Stress (Carriage/Release)
  - b. Recognition/Prevention/Recovery From Out of Control
8. Time to Ground Impact
  - a. Wings Level
  - b. Overbank/Under "G"
9. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)



**Attachment 11**  
**AIR-TO-SURFACE WEAPONS EMPLOYMENT BRIEFING**

**SURFACE ATTACK TACTICS**

**GENERAL MISSION DATA**

1. Intelligence/Threat Scenario
2. Low-Level (See Low-Level Briefing Guide)
3. Fence Checks
4. Operating Area Entry/Description/Boundaries
5. 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
    - (4) IR Considerations
6. 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
    - (2) IP to Action Point
    - (3) During Delivery
7. Ordnance/Weapons Data
  - a. Type/Fuzing
  - b. Weapons Settings
  - c. Desired Effects
  - d. Specific Aim Points
  - e. Minimum Altitudes
    - (1) Safe Escape/Safe Separation
    - (2) Fuze Arming/Frag Avoidance
8. Laser Operations

**EMPLOYMENT PROCEDURES**

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

#### **RANGE DEPARTURE PROCEDURES**

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

#### **MISSION REPORTING (BDA/IN-FLIGHT REPORT)**

#### **CONTINGENCIES**

1. Rejoin for late takeoff
2. Two/Three Ship Options
3. Tactical Lead Changes
4. Air-to-Air TACAN
5. Codewords
6. Weather Backup Deliveries
7. Degraded Systems
8. Reattack
9. Wounded Bird/Escort Procedures

#### **NIGHT PROCEDURES**

1. Aircraft Lighting
2. Radio Calls
3. Target ID/Range Lighting

4. Night Spacing Techniques
5. Instrument Cross-check/Disorientation

#### **TRAINING RULES/SPECIAL OPERATING INSTRUCTIONS**

#### **ALTERNATE MISSION**

1. Type Mission (refer to appropriate mission briefing guide)
2. Mission Objectives

#### **SPECIAL SUBJECTS**

1. Error Analysis
2. Fouls
3. Minimum Altitudes
4. Target Fixation
5. "G" Awareness
6. Fuel Awareness/Ops Checks/AB Use/Consumption Rates
7. Maneuvering Limitations
  - a. Airspeed/"G"/Stress (Carriage/Release)
  - b. Recognition/Prevention/Recovery From Out of Control
8. Time to Ground Impact
  - a. Wings Level
  - b. Overbank/Under "G"
9. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)

**Attachment 12**  
**AIR-TO-SURFACE WEAPONS EMPLOYMENT BRIEFING GUIDE**

**INTERDICTION/ARMED RECCE/CLOSE AIR SUPPORT**

**GENERAL INFORMATION**

1. Intelligence/Threat Scenario
2. Low Level
3. En Route Formation(s)/Look Out Responsibilities/LOWAT (if applicable)
4. Fence Checks
5. Ordnance/Weapons Data
  - a. Type/Fuzing
  - b. Weapons Settings
  - c. Live Ordnance Procedures/Minimum Altitudes
    - (1) Safe Escape/Safe Separation
    - (2) Fuse Arming/Frag Avoidance
    - (3) Missile Launch Parameters
  - d. Laser Operations
6. Control Agency
  - a. Call Sign
  - b. Frequencies
7. Coordination
  - a. Attack Package Times/Support
  - b. Data Gathering/Passage
  - c. Airspace Restrictions
  - d. Mission Number
  - e. Friendly Forces
  - f. Play Time

**ARMED RECCE/CLOSE AIR SUPPORT PROCEDURES**

1. Working Area
2. Formations/Working Altitudes
3. Target Types/Threat Array
4. Attack Tactics

**WEAPONS DELIVERY**

1. Tactics
  - a. Type Delivery
  - b. Switchology
  - c. Attack Parameters
    - (1) Action Point/IP/Pop Point
    - (2) Altitude (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/In-Flight Report)

**COMBAT SAR PROCEDURES**

1. Communications Procedures
2. Downed Aircraft Procedures
3. On-Scene Commander
4. Fuel Considerations
5. Ordnance Considerations

**CONTINGENCIES**

1. Two/Three-Ship Option
2. Tactical Lead Changes
3. Air-to-Air TACAN
4. Code Words/Comm Out Signals
5. Weather Back-Up Deliveries
6. Degraded Systems
7. Reattack
8. Asymmetrical Considerations
9. Jettison Procedures/Parameters
10. Hung/Unexpended Ordnance Procedures
11. Wounded Bird/Escort Procedures

**TRAINING RULES/SPECIAL OPERATIONS INSTRUCTIONS**

**ALTERNATE MISSION**

1. Type Mission (Refer to appropriate mission briefing guide)
2. Mission Objectives

**SPECIAL SUBJECTS**

1. Error Analysis

2. Fouls
3. Minimum Altitudes
4. Target Fixation
5. "G" Awareness
6. Fuel Awareness/Ops Checks/AB Use Consumption Rates
7. Maneuvering Limitations
  - a. Airspeed/"G"/Stress (Carriage/Release)
  - b. Recognition/Prevention/Recovery From Out of Control
8. Time to Ground Impact
  - a. Wings Level
  - b. Overbank/Under "G"
9. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)

**Attachment 13**  
**ALERT BRIEFING GUIDE**

This guide is all inclusive and is designed to incorporate all the applicable items from the General Briefing Guide. If a specialized mission such as air refueling is anticipated, the specific briefing guide for that mission should also be used.

**MISSION DATA**

1. Time Hack
2. Mission Data Card
  - a. Call Signs
  - b. Aircraft/Location / Status
  - c. Takeoff/Landing Data (Worst Case)
  - d. Joker/Bingo Fuel
3. Actual/Forecast Weather
  - a. Homebase
  - b. Alternates
  - c. Individual Weather Category/Mandatory Status
4. NOTAMs
5. FCIF/Pubs/Maps
6. Personal Equipment
7. Alert Packet
  - a. Authenticators/Duress Code
  - b. Security Procedures
8. Airfield Status
  - a. Actual versus Max Allowable Tailwind
  - b. Barriers
  - c. Navigation Aids
  - d. Hazards to Taxi/RCR

**GROUND PROCEDURES**

1. Aircraft/Armament Preflight
2. Cockpit Set-Up
3. Engine Run/Hot Preflight
4. Crew Chief Briefing
5. Quick Check Procedures

**LAUNCH PROCEDURES**

1. Notification/UHF Frequency/Authentication Requirement
2. Status
  - a. Airborne Order

- b. Battle Stations
  - c. Runway Alert
  - d. Scramble
3. Taxi
4. Takeoff/Runway Lineup/Interval/Formation
- a. Day VMC
  - b. Day IMC
  - c. Night VMC
  - d. Night IMC
5. Join Up/Trail Formation/Power Settings/Airspeeds

### **IN-FLIGHT PROCEDURES**

- 1. Formation
- 2. Airspeeds
- 3. Weapons Safe Checks
- 4. Radar Search Responsibilities
- 5. Degraded Fire Control System
- 6. Transfer of Lead Procedures
- 7. Ops Checks
- 8. EMCON Procedures
- 9. Region Minimum Safe Altitude (MSA)
- 10. VID Procedures
  - a. Authority Required to Close
  - b. Formation/Tactics
  - c. Range/Altitude Separation Requirements on Target Prior Permission to Close With/Without Visual Contact
  - d. Radar Lock-On Requirements
  - e. Maximum Closure Speed
  - f. Minimum Airspeed
  - g. Loss of Contact Procedures
  - h. Breakaway Procedures
  - i. Restrictions
- 11. Aircraft in Distress
  - a. Minimum Closure Distance
  - b. Visual Signals - Day/Night
  - c. Escort Procedures
  - d. Recovery/Landing Visual Signals
  - e. Dissimilar Formation Procedures
- 12. Jettison Procedures
- 13. Lost Wingman



14. SARCAP
15. Emergency Airfields

#### **SPECIAL SUBJECTS**

1. Emergency of the Day
2. Fuel Awareness
3. Maneuvering Limitations
4. Recognition/Prevention/Recovery from Loss of Control
5. Spatial Disorientation
6. Recall Procedures
7. Rules of Engagement (ROE)
8. Hazards Associated with Human Factors (i.e., Channelized Attention, Task Saturation/Prioritization, and Complacency)

#### **CREW COORDINATION**

1. Pre-Flight
2. Prohibited Items
3. Flight Maneuvering Parameters
4. Mission Duties
5. Change of Aircraft Control
6. WSO Flying Parameters
7. Rear Seat Landing Procedures
8. Emergencies
  - a. Runway Departure
  - b. Canopy Loss
  - c. Ejection/Egress (With and Without Intercom)/Command Selector Valve Position
  - d. Loss of Intercom
  - e. Bird Strike Procedures/Use of Visor(s)

#### **GROUND CREW BRIEFING**

1. Act only on pilot's instructions
2. Ground emergency procedures
3. Hand signals
4. Aircraft danger areas

**Attachment 14**  
**CREW COORDINATION/PASSENGER/GROUND CREW BRIEFING GUIDE**

**CREW COORDINATION/PASSENGER**

1. Pre-Flight
2. Prohibited Items
3. Cockpit Layout
4. Flight Maneuvering Parameters
5. Mission Duties
6. Change of Aircraft Control
7. WSO Flying Parameters
8. Rear Seat Landing Procedures
9. Emergencies
  - a. Runway Departure
  - b. Canopy Loss
  - c. Ejection/Egress (With and Without Intercom)/Command Selector Valve Position
  - d. Loss of Intercom
  - e. Bird Strike Procedures/Use of Visor(s)

**GROUND CREW**

1. Act only on pilot's instructions
2. Ground emergency procedures
3. Hand signals
4. Aircraft danger areas

**Attachment 15**  
**MISSION DEBRIEFING GUIDE**

**GROUND PROCEDURES**

**TAKEOFF/JOIN-UP/DEPARTURE**

**EN ROUTE PROCEDURES**

**RECOVERY/LANDING/AFTER LANDING**

**GENERAL**

1. SIIs
2. Radio Procedures
3. Flight Discipline/Effectiveness

**MISSION ACCOMPLISHMENT/ANALYSIS**

1. Mission Reconstruction
2. Mission Support
3. VTR/Film Assessment
4. Anti-G Straining Maneuver Effectiveness
5. Learning Objectives Achieved
6. Lessons Learned
7. Recommendations for Improvement

**COMMENTS/QUESTIONS**

**Attachment 16**  
**SUBJECT – PARAGRAPH INDEX**

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