*BY ORDER OF THE*
*SECRETARY OF THE AIR FORCE*

***AIR FORCE INSTRUCTION 11-2F-16V3***

***18 DECEMBER 2013***

***Flying Operations***

***F-16--OPERATIONS PROCEDURES***

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**



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This publication establishes effective and safe operations of the F-16 and implements AFPD 11-2, *Aircrew Operations*; AFPD 11-4, *Aviation Service*; and AFI 11-202V3, *General Flight Rules*. It establishes the minimum Air Force operations procedures for personnel performing duties in the F-16. This publication applies to the US Air Force Reserve Command (AFRC) and the Air National Guard (ANG). MAJCOMs, Direct Reporting Units (DRU) and Field Operating Agencies (FOA) will forward proposed MAJCOM/DRU/FOA-level supplements to this volume to HQ USAF/A3O-AI, through HQ ACC/A3TO, for approval prior to publication IAW AFPD 11-2, paragraph **2.2** Copies of approved and published supplements will be provided by the issuing office to HQ USAF/A3O-AI, HQ ACC/A3TO, and the user MAJCOM/ DRU/FOA offices of primary responsibility (OPR). Field units below MAJCOM/DRU/FOA level will forward copies of their supplements of this publication to their parent MAJCOM/DRU/FOA OPR for post-publication review. **Note:** The above applies only to those DRUs/FOAs that report directly to HQ USAF. Keep supplements current by complying with AFI 33-360, *Publications and Forms Management*. Unless another approval authority is cited, waiver authority for this volume is the MAJCOM/A3, or COMAFFOR for those aircrew and assets under the COMAFFOR's oversight. Requests for waivers must be submitted through the chain of command to the appropriate Tier waiver approval authority or if a non-tier requirement, to the publication OPR for consideration. COMAFFOR will notify HQ ACC/A3 and home station MAJCOM/A3 of waivers within 72 hours of approval. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication;* route AF Forms 847 from the field through the appropriate functional chain of command. HQ ACC/A3 will coordinate all changes to the basic volume with all MAJCOM/A3s. Ensure that all records created as a result of

processes prescribed in this publication are maintained in accordance with AFMAN 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS), located in the Air Force Records Information Management System (AFRIMS). **Note:** This instruction contains references to the following field (subordinate level) publications and forms which, until converted to departmental level publications and forms may be obtained from the respective MAJCOM publication distribution office.

## *SUMMARY OF CHANGES*

This document has been substantially revised and must be completely reviewed. Major changes include: over water flight waivers, Digital Terrain System planning, ARTS/PARS guidance, removal of TFR procedures, targeting pod procedures, AIFF interrogation usage, trail recovery procedures, simulated gun employment, hung ordnance recovery changes, configuration changes for HARTS maneuvers, wake turbulence landing spacing, G-Awareness exercise procedures, NVG procedures, HUD as a primary flight reference, CAT D approach usage, air abort addition, hung ordnance change, SAR procedures addition, identifies Tiered waiver authorities for unit level compliance items, and numerous administrative changes.

## Chapter 4

## INSTRUMENT PROCEDURES

### 4.1. General.

4.1.1. Head-Up Display (HUD) Use. Regardless of Block, do not use the HUD to recover from an unusual attitude or while executing lost wingman procedures except when no other reference is available. The HUD in F-16 Block 25/30/32 aircraft and Block 40/42/50/52 aircraft has been certified as a primary flight instrument and may be used as a primary flight reference in night/IMC conditions. The HUD in all other F-16 Blocks may be used as an additional instrument reference only. No F-16 Block may use the HUD as the sole reference in night/IMC conditions. **(T-1).**

4.1.2. INS/GPS or EGI Use. The F-16 INS/GPS and EGI are approved for enroute Area Navigation (RNAV). Neither RNAV nor GPS approaches are authorized.

4.1.3. Simulated Instrument Flight. Simulated instrument flight requires a qualified safety observer in the aircraft or in a chase aircraft. The observer may occupy either seat of the F-16B/D provided the intercom is operable. Use the radar to aid in clearing the area. Pilots in F-16A/C aircraft may not log simulated instrument flight without a chase. They may fly multiple approaches in VMC without a chase, but will place their primary emphasis on seeing and avoiding other aircraft. Chase aircraft may move into close formation on final for a formation landing provided simulated instrument flight is terminated. **(T-1).**

### 4.2. Takeoff and Initial Join-up.

4.2.1. If weather is below 1,500 foot ceiling and 3 miles (5 km), each aircraft and element will climb on takeoff heading to 1,000 feet AGL before initiating any turns, except when departure instructions specifically preclude compliance. **(T-1).**

### 4.3. Trail Procedures.

4.3.1. General. During trail formations, basic instrument flying is the first priority and will 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 radar contact, immediately concentrate on flying the instrument procedure, then notify the flight lead. The flight lead will notify ATC. **(T-1).**

4.3.1.1. Flight leaders will request non-standard formation from ATC. **(T-1).**

4.3.1.2. ATC instructions issued to the lead aircraft apply to the entire flight.

4.3.1.3. Normal spacing is 2-3 NM.

4.3.1.4. Each aircraft and element will follow the No Radar/Sensor Contact procedures until the aircraft or element immediately in trail has radar/sensor contact and called "tied." **(T-1).**

4.3.2. No Radar/Sensor Contact. **(T-1).**

4.3.2.1. The flight leader will call initiating all turns. Subsequent aircraft must delay turns to maintain the desired spacing.

## Attachment 3

## FLIGHT BRIEFING GUIDES

### Table A3.1. General Briefing Guide.

**Mission Data.**
- Time Hack
- EP / Threat of the Day
- Mission Objective(s)
- Mission Overview
- Mission Data Card
  - Mission Commander / Deputy Lead
  - Joker / Bingo Fuel
  - Takeoff and Landing Data
- Weather / Sunrise / Sunset / Moon Illumination
- Tactical Decision Aid / Transmissivity / Absolute Humidity
- NOTAMs / Bird Strike Potential
- Personal Equipment
- FCIF / Pubs / Maps

**Ground Procedures.**
- Step
- Pre-Flight
  - Aircraft
  - Armament
- Boresight
- Check-In
- Taxi / Marshalling / Arming
- Spare Procedures

**Takeoff.**
- Runway Lineup
- Formation Takeoff
- Takeoff Interval
- Abort
- Jettison Procedures
- Low Altitude Ejection
- Landing Immediately After Takeoff

**Departure/En Route.**
- Routing
- Trail Departure
- Join-Up / Formation
- Systems / Ops Checks

**Airspace.**
- Area
- Times
- Restrictions (Chaff/Flare/Supersonic)
- Bailout (Controlled/Uncontrolled)

**Recovery.**
- Rejoin
- Battle Damage / Bomb Check
- Type Recovery
- Flight Break-Up
- Pattern and Landing
- After Landing / De-Arm
- Emergency / Alternate Airfields

**Special Subjects (As Applicable).**
- General Roles and Responsibilities (IP, Flight Lead, Wingman)
  - Formation Specific Responsibilities and Priorities
  - Flight Member Mission Priorities
  - Task / Sensor Prioritization
  - Deconfliction Contracts
- Chase Procedures
- IFF Procedures
- Collision Avoidance
  - Radar / Visual Search Responsibilities
    - Departure/Enroute/Recovery
    - High Density Traffic Areas
  - Mid-Air Collision Avoidance
    - From Other Military Aircraft
    - From Civilian Aircraft
- Dissimilar Formations
- Terrain Avoidance
  - Departure / En Route / Recovery
  - Use of Controlled Flight Into Terrain Prevention Systems
    - CARA ALOW
    - MSL Line-In-The-Sky
    - Ground Collision Avoidance System (GCAS)/Minimum Terrain Clearance (MTC) (AGCAS)/MODE/Chevrons
    - Targeting Pod Attitude Advisory Function
- Bird Strike Procedures / Use of Visor(s)
- Human Factors Considerations (i.e., Channelized Attention, Task Saturation / Prioritization and Complacency)
- G-AwarenessTurn / G-Suit connection / G-tolerance
  - Use of L-1 Anti-G Straining Maneuver
- Visual Illusions / Perceptions
- Spatial Disorientation / Unusual Attitudes / G-excess illusion
  - PARS Considerations

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|---|---|
| MSA | Lost Wingman<br>Radio Inoperative<br>SAR / CSAR<br>Recall Procedures<br>SIIs<br>Pilot currencies for events to be flown<br>**Training Rules / Special Operating Instructions / Rules of Engagement**<br>**Tactical Portion of Mission** |

**Table A3.2. Additional Briefing Items, NVG.**

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|---|---|
| **Weather / Illumination:**<br>Civil / Nautical Twilight<br>Moon Rise/Set Times / Phase / Elevation / Azimuth<br>Ceiling / Visibility<br>LUX / EO TDA<br>Obscurants to Visibility<br>**NVG Preflight:**<br>Check Adjustments / Helmet Fit and Security<br>Batteries<br>Resolution / Focus (Hoffman ANV-20/20 Tester, Eye Lane)<br>NVG Compatible Flashlight<br>**Cockpit Preflight:**<br>Cockpit Setup<br>Cockpit Lighting (Leaks)<br>Cockpit FAM<br>Check Focus and Stow for Taxi<br>**Before Takeoff:**<br>Don NVGs / Check and Adjust<br>Stow for Takeoff<br>**Airborne:**<br>Exterior Lights<br>NVG Donning<br>Scan Pattern<br>Forward Scan<br>Narrow Field of View vs. Field of Regard<br>Peripheral Vision<br>Scan Techniques<br>Join-up and Enroute Considerations<br>Rejoin / Closure<br>Air-to-Air TACAN<br>G-Awareness Considerations<br>Lighting<br>Visible Horizon/30 Up & Down Maneuver | **F-16D NVG Procedures / Crew Coordination**<br>**NVG Abnormal Situations / Emergencies**<br>Lost Sight-NVGs<br>Lost Wingman-NVGs<br>Transition to Instruments<br>Visual Illusions / Depth Perception<br>Disorientation / Misorientation / Vertigo / PARS<br>Fatigue<br>NVG Failure<br>Battery Failure / Swap Out<br>Overconfidence in NVG Capabilities<br>Correct Lighting of Primary / Secondary Flight Instruments<br>Lost Comm (with Wingman / Target)<br>Aircraft Emergency<br>Ejection-Goggles-OFF<br>Target Fixation<br>Lack of Dive Information<br>Target / Fighter Enters IMC<br>No Tally by 1,500' Slant Range<br>700 feet in VID mode [except tanker rejoins]<br>Radar Break Lock Inside 1,500'<br>Excessive Overtake / Target Maneuvers<br>Laser Eye Protection (LEP) Use<br>Laser / IR Pointer Safety<br>NVG FOD Considerations (Batteries, Equipment, etc)<br>**NVG ROE/Training Rules** |

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| Deconfliction / Separation<br>Route Study / Scene Interpretation<br>NVG Predictions<br>Terrain/Shadowing/Visual Illusions/Visible Horizon<br>Terrain Avoidance<br>Radar Altimeter<br>City / Cultural Lighting<br>Direction / Orientation of Lighting<br>Formation Maneuvering<br>Map Reading | |

**Table A3.3. Additional Briefing Items, Air Refueling.**

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| **General**<br>Tanker Call Sign(s) / Receiver Assignments<br>Refueling Track(s)<br>Altitude<br>Airspeed<br>Airspace Restrictions<br>ARIPs, ARCPs, ARCTs<br>Radio Frequencies<br>**Buddy Procedures:**<br>Departure<br>Join-Up<br>**En Route:**<br>Route of Flight<br>Formation<br>Ops Checks<br>**Rendezvous:**<br>Type Rendezvous<br>Holding Procedures / Formation<br>Ground Radar Assistance<br>Tanker Identification - TACAN / Radar / Visual<br>Radar Procedures / Techniques<br>Wingman / Deputy Lead Responsibilities<br>Receiver Formation / Join-Up Procedures<br>Rendezvous Overrun | **Refueling:**<br>Checklist Procedures<br>Radio Calls<br>Refueling Order<br>Techniques<br>EMCON Level<br>Visual Signals<br>Fuel Off-Load<br>Bingo Fuel (Abort Points / Abort Bases)<br>Drop-Off Procedures<br>Wake Turbulence<br>**Reform and Exit:**<br>Formation<br>Clearance<br>**Emergency Procedures:**<br>Breakaway Procedures<br>Systems Malfunctions<br>Damaged Receptacle<br>**IMC/Night Considerations:**<br>Loss of Visual Contact<br>Aircraft Lighting<br>**Special Subjects:**<br>Fuel Awareness / AB Use / Consumption Rates<br>Flight Path Deconfliction / Other Receiver Considerations<br>Human Factors Considerations (i.e., Channelized Attention, Task Saturation / Prioritization and Complacency) |

**Table A3.4. Additional Briefing Items, Low-Level Navigation.**

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| **General**<br>Route / Clearance / Restrictions<br>Flight Responsibilities | **Contingencies**<br>Aircraft Fallout Plan<br>Rejoin After Late Takeoff |

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| Navigation<br>Radar / Visual Search<br>Entry / Spacing / Holding / Initial Altitude / MSA<br>**Route Procedures:**<br>Fence Checks<br>Tactical Formation / Turns<br>**Low-Level Navigation**<br>Dead Reckoning/Use of Nav Aids/Equipment (EGI)<br>Radar Procedures / Techniques / Predictions<br>Visual Procedures / Techniques / IR Predictions<br>Updates / Calibrations<br>Time / Fuel Control<br>Terrain Following / Wingman Considerations / Pilot Comfort Level<br>Leg Altitudes/Set Clearance Plane/Obstacles (MSL/AGL)<br>Turnpoint Acquisition<br>Obstacle / Ground Avoidance<br>Use of Altitude Warning Features (GCAS, ALOW and Line-In-The-Sky MSL Floor Settings, AGCAS MODE/Chevrons Enabled/Disabled)<br>Threat Reactions<br>RWR / ECM / Chaff / Flares<br>Engagement Criteria<br>Flight Path Deconfliction<br>Termination | **Emergencies:**<br>Aircraft Malfunctions<br>Route Abort Procedures (RAA / MSA) / ATC Frequencies<br>**Alternate Mission**<br>Type Mission (refer to appropriate mission briefing guide)<br>Mission Objectives<br>**Special Subjects**<br>Airspace Restrictions<br>G-Awareness / Ops Checks<br>Fuel Awareness / AB Use / Consumption Rates<br>Flight Path Deconfliction<br>Maneuvering Limitations<br>Airspeed and G<br>Recognition/Prevention/Recovery from Out of Control<br>Time to Ground Impact<br>Wings Level<br>Overbank / Under G<br>Night Considerations<br>Human Factors Considerations (i.e., Channelized Attention, Task Saturation / Prioritization and Complacency) |

**Table A3.5. Additional Briefing Items, Air-to-Surface Range Operations.**

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| **Range Information**<br>Target / Range Description<br>Restrictions<br>Range Entry / Holding<br>Radio Procedures<br>Formation<br>Sequence of Events<br>Pattern Procedures<br>Aircraft Fallout Plan<br>Rejoin on Range for Late Takeoffs<br>**Employment Procedures/Techniques:**<br>Avionics / Switch Positions<br>Weapons Switchology / Delivery Mode<br>Radar Switchology<br>Special Weapons Switchology<br>Laydown / Loft Events | **Night Procedures:**<br>Aircraft Lighting<br>Radio Calls<br>Target ID / Range Lighting<br>Night Spacing Techniques<br>Instrument Cross-check / Disorientation<br>Flare Pattern<br>Flare Release Points and Interval<br>Wind Effect / Offset<br>Dud Flare Procedures<br>Switching Aircraft Patterns<br>**Over Water Range Operations:**<br>Employment Techniques<br>Depth Perception / Reduced Visual Cues<br>Distance / Altitude Estimation<br>Pop-Up Positioning |

- Ground track / Altitude / Airspeed
- Radar / Optical Depiction (OAP / TGT)
- Radar / Optical Tuning / Techniques
- Pickle / Release Point
- Breakaway / Recovery Technique
- Backup Deliveries / EMR
- Delivery Spacing
- Pop-Up Delivery
  - Entry Airspeed / Altitude
  - Pop Point / Pull-Up Angle / Power Setting
  - Target Acquisition
  - Pull Down / Apex Altitudes
  - Pattern Corrections
- Roll-In
  - Position
  - Techniques (Pitch / Bank / Power)
  - Roll-Out / Wind Effect
- Final
  - Aim-Off Distance
  - Dive Angle
  - Airspeed
  - HUD Depiction
  - Sight Picture / Corrections / Aim-Point
  - Release Parameters
  - Release Indications
  - Recovery Procedures

**Special Procedures:**

- Live Ordnance Considerations
  - Safe Escape / Safe Separation
  - Fuse Arming / Frag Avoidance
- RBS Operations
- Laser Operations
  - Timing
  - Visual/Aircraft References to Establish Pull-Up Pt
- Special Considerations
  - Adjusted Minimum Altitudes

**Range Departure Procedures:**

- Armament Safety Checks
- Rejoin
- Battle Damage / Bomb Check
- Jettison Procedures / Parameters
- Hung / Unexpended Ordnance
- Inadvertent Release
- Gun Unsafe / Jam

**Alternate Mission**

- Type Mission (refer to appropriate mission briefing guide)
- Mission Objectives

**Special Subjects**

- Error Analysis
- Fouls
- Minimum Altitudes
- Target Fixation
- G-Awareness
- Fuel Awareness / Ops Checks / AB Use / Consumption Rates
- Maneuvering Limitations
  - Airspeed / G / Stress (Carriage / Release)
  - Recognition/Prevention/Recovery from Out of Control
- Time to Ground Impact
  - Wings Level
  - Overbank / Under G
  - Chevron Cues Enabled/Disabled
- Human Factors Considerations (i.e., Channelized Attention, Task Saturation / Prioritization, and Complacency)

## Table A3.6. Crew Coordination / Passenger / Ground Crew Briefing Guide.

**Crew Coordination / Passengers:**

- Pre-Flight
- Prohibited Items
- Cockpit Layout
- Flight Maneuvering Parameters
- Change of Aircraft Control
- Rear Seat Landing Procedures
- Emergencies
  - Runway Departure
  - Canopy Loss

**Ground Crew:**

- Act Only On Pilot's Instructions
- Ground Emergency Procedures
- Hand Signals
- Aircraft Danger Areas

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|---|---|
| Ejection / Egress (With and Without Intercom) / Ejection Mode Selector Handle Position<br>Loss of Intercom<br>Bird Strike Procedures / Use of Visor(s)<br>Flight Control Interference<br>Rudder Interference - Rudder Pedal Adjustment<br>Stick Interference - Lapbelt, Utility Light, Personal Equipment, Leg Position, Paddle Switch Override | |

**Table A3.7. Mission Debriefing Guide.**

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|---|---|
| **Ground Procedures**<br>**Takeoff/Join-Up/Departure**<br>**En Route Procedures**<br>**Recovery/Landing/After Landing**<br>**General:**<br>SIIs<br>Radio Procedures<br>Flight Member Responsibilities<br>Formation and Deconfliction Contracts<br>Sensor Management/Prioritization<br>**Training Rules/Special Operating Instructions** | **Mission Accomplishment/Analysis:**<br>Mission Reconstruction<br>Mission Support<br>VTR / Film Assessment<br>Anti-G Straining Maneuver Effectiveness<br>Tactical Employment Priorities<br>Learning Objectives Achieved<br>Lessons Learned<br>Recommendations for Improvement<br>**Comments/Questions** |