

STANDARD OPERATING PROCEDURES

388th vFighter Squadron
Standard Operating Procedures
132nd Virtual Wing

STANDARD OPERATING PROCEDURES

APPLIES TO: 388TH VFIGHTER SQUADRON

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2. Introduction

<u>Scope</u>: This document outlines the Standard Operating Procedures for the 388th Virtual Fighter Squadron of the 132nd Virtual Wing. All 388th pilots must be familiar with the contents of this document.

<u>Content:</u> This document contains normal and emergency operating procedures related to the squadron operations of the F-16C Fighting Falcon.

<u>Pilot responsibility:</u> Use common sense. SOPs describe standardised procedures for most circumstances but is no substitute for common sense and judgment. It is the pilot's responsibility to fly the aircraft safely and effectively in all circumstances, as required to accomplish the overall mission.

<u>Deviations</u>: Deviation from these SOPs are approved, provided that they are communicated to all parties and are subject to the agreement of the flight lead.

<u>Recommended changes:</u> Improvements and recommended changes to this SOP should be stated to 388th Instructor Pilots.

3. Roles & Responsibilities

Flight Lead

The Flight Lead (FL)is ultimately responsible for the safe conduct of a flight and the tactical execution of the mission. They should lead planning activities in the lead-up to the flight, brief the flight to safely prepare for the mission being undertaken and ensure the smooth conduct of the flight. The Flight Lead is responsible for making appropriate tactical decisions which support the mission and ensuring the welfare of all flight members.

Element Lead

An Element Lead holds responsibility for supporting the flight lead in all activities, including planning and briefing. As a sub-leader within the flight, an Element Lead may be required to provide tactical leadership for a wingman within the element to support objectives as directed by the flight lead.

Winaman

All wingmen within a flight, including any element lead, are responsible for assisting in planning and briefing activities where required and ensuring the proper operation of their aircraft in support of the objectives of the mission and Flight Leads' direction. A wingman will also be responsible for:

- Supporting the separation of the flight and maintaining visual scans around the flight, particularly whilst the flight lead is 'heads-down'.
- Identifying potential threats or hazards to the flight, supporting the overall flight situational awareness.
- Ensuring the safe conduct of the flight, challenging the flight lead when appropriate.
- Adhering to standard operating procedures, procedures provided as part of a briefing which deviate from the norm and instructions provided by the flight or element lead as appropriate.
- Other tasks as directed by Flight Lead.

3.1 Flight Planning

The Flight lead is responsible for ensuring appropriate planning are conducted and that the plan is shared among flight members, such that flight can be flown in a safe and efficient manner, promoting the likelihood of mission success.

- 3.1.1 Flight Leads must prepare a plan, containing communication, navigation and weapon employment guidelines for the flight.
- 3.1.2 Flight Leads should plan appropriate contracts for the flight.
- 3.1.3 Flight Leads should provide an appropriate briefing for all flight members.
- 3.1.4 Flight Leads should liaise with relevant parties when planning a flight, including but not limited to the Mission Commander (MC) (also known as the Package Commander), other Flight Leads, AWACS and other controlling agencies such as JTACs.
- 3.1.5 Element Leads and wingmen should review the briefing provided such that they have a clear understanding of the expected conduct in the mission.
- 3.1.6 Element Leads and wingmen should ask questions if appropriate to ensure a full and thorough understanding of the planed flight.
- 3.1.7 Flight Members should ensure they have appropriate charts and FLIPs for the sortie being flown, including, but not limited to, departure aerodrome charts, arrival aerodrome charts and alternate arrival aerodrome charts.

3.2 Mission Execution

In order to safely execute a mission, all participants in a flight must ensure that they remain responsible for the safe operation of their jet and its' associated equipment. Each participant in the flight must remain committed to achieving the mission objectives, supporting the Flight Lead and any controlling agencies.

- 3.2.1 Flight members should ensure that appropriate, approved checklists are available to them, as well as mission data cards or other parameters provided for the mission.
- 3.2.2 Flight Members should maintain appropriate two-way communication within the flight and with appropriate external agencies.
- 3.2.3 Flight Members must report changes in mission posture, threat picture and airframe status as soon as is practicable.
- 3.2.4 Wingmen are responsible for maintaining wing-tip clearance during all phases of flight.

4. Mission Planning

In order for a flight to achieve maximum effectiveness, a clear objective for the flight should be defined. Plans made by package and flight leaders should propose a preferred option for completing the mission but should also consider contingencies and alternate plans. The plan produced must promote a safe, effective and economical mission accomplishment.

4.1 Mission Types and Intentions

4.1.1 Package and Flight Leads must provide a plan which clearly defines the type of mission being flown, the intent and desired end-state of the mission. Types of missions that may be flown are defined in 132nd TTP documents.

4.2 Payload, Fuel and Weight Planning

- 4.2.1 Package and Flight Leads should plan to carry an appropriate payload for their flight, ensuring that the MTOW for the aircraft is not exceeded.
- 4.2.2 Package and Flight Leads must ensure that appropriate fuel is planned for the flight, which may include a tanking plan.

4.3 Planning outputs

- 4.3.1 Package and Flight Leads must produce an appropriate briefing for all participants in the flight or package, which clearly depicts the intended route to be flown.
- 4.3.2 Package and Flight Leads should produce appropriate mission data cards for all participants for use on a kneeboard, such that information required for the execution of the mission is readily available in flight.

5. Mission Briefing

Providing a mission briefing is a critical step in ensuring that all participants of a flight are clear on the expectations of the mission, the requirements of each participant in the flight and the steps required achieving mission success. A good briefing ensures good situational awareness for all participants of the mission with respect to friendly and enemy forces; areas to be overflown and avoided; and communications and tanking plans if required. See section 10 for additional information.

5.1 Mission Overview

- 5.1.1 The mission briefing must provide a clear overview of the mission, including the type of mission being flown, the objectives and participants of the mission.
- 5.1.2 The missing briefing should provide a depiction of the planned route for the mission.

5.2 Friendly Situation

- 5.2.1 The mission briefing should provide a depiction of friendly forces within the AO, including the locations of concurrent missions and external assets relevant to the conduct of the flight.
- 5.2.2 The mission briefing should detail the location of friendly assets within the AO.
- 5.2.3 The mission briefing should show the location of the FLOT line.

5.3 Enemy Situation

5.3.1 The mission briefing should provide a depiction of known enemy forces within the AO, including the approximate locations of threats of known missions and supporting assets.

5.4 Threat Assessment

- 5.4.1 The mission briefing must provide a detailed threat assessment, depicting the known and anticipated threats within the AO for both Air-to-Air and Air-to-Ground operations.
- 5.4.2 The mission briefing should provide a detailed description of the types of threat located in each area such that a defensive posture can be adopted.

5.5 Mission Flow and Time Hack

- 5.5.1 The mission briefing should provide a description of the mission flow, depicting the anticipated sequence of events to accomplish the mission.
- 5.5.2 The mission briefing should provide a timeline for the anticipated sequence of events to facilitate inter-working between flights and packages.

5.6 Contracts

5.6.1 The mission briefing must specify appropriate contracts for the flight, including:

Departure contracts

Formation contracts

Communications contracts

Tactical contracts

Weapons employment contracts

6. Normal Procedures

6.1 Communications and Start-up

- 6.1.1 All flight members must ensure two-way communication on both primary and auxiliary radios during start-up.
- 6.1.2 All flight members must remain tuned to the same primary radio frequency at all times in order to maintain flight integrity, unless otherwise directed by the Flight Lead.
- 6.1.3 All flight members should remain tuned to the same auxiliary radio frequency at all times unless otherwise directed by the Flight Lead.
- 6.1.4 When changing frequency at any stage of flight, all flight members should 'check in', unless directed by the Flight Lead (using the brevity term "GO" Example "VIPER GO, preset 2 Uniform"). Changes of frequency should be directed by the Flight Lead on the current primary frequency and must be acknowledged by all flight members.
- 6.1.5 Flight members must light their position lights when the aircraft is considered 'under power' and emitting exhaust gasses of any type.
- 6.1.6 Flight members should not start their engines until directed by the Flight Lead.
- 6.1.7 Flight members are responsible for ensuring that the correct checklist is followed for start-up.
- 6.1.8 Flight members should report the conclusion of their start check-lists at the earliest possible opportunity.

6.2 Lights

- 6.2.1 Position lights shall be set to flash during startup or shutdown.
- 6.2.2 When the F-16 is ready to taxi, position light shall be set to steady.
- 6.2.3 During taxi, taxi light shall be set to on.
- 6.2.4 When entering runway turn anti collision light on, and landing light on.
- 6.2.5 For anti collision lights, #1 will use 1, #2 will use 2, #3 will use 3, #4 will use 4.
- 6.2.6 Upon clearing active runway after landing, taxi light to be set to on, and anti collision set to off.

6.3 Taxi

- 6.3.1 The use of the Taxi light is mandatory whilst the aircraft is in the taxi phase of flight.
- 6.3.2 The default taxi posture is staggered.
- 6.3.3 The minimum taxi interval s 150 feet staggered or 300 feet in trail. Spacing may be reduced when holding short of or entering the runway.
- 6.3.4 Taxi separation at night must be no less than 300 feet and on the taxiway centreline.
- 6.3.5 Taxi in snow or ice conditions must be performed on the centreline with a minimum of 300 feet separation in trail.

6.4 Take-off

- 6.4.1 Before entering a runway for departure, the anti-collision light must be lit.
- 6.4.2 Flights will line up as appropriate based on the weather conditions, runway size and runway conditions.
- 6.4.3 Departure spacing between separated elements/flights will be a minimum of 500 feet.
- 6.4.4 After 'Before Take-off Checks' have been completed, all flight members will inspect each other for proper configuration and abnormalities.
- 6.4.5 Afterburner must be used if the flight anticipates that greater than 50% of the runway length will be used in the take-off roll when using MIL power.
- 6.4.6 Take-off interval between aircraft/elements will be a minimum of 10 seconds (15 seconds forafterburner). When join-up is to be accomplished in 'VMC on top' conditions or when carrying live air-to-surface ordnance,take-off interval will be increased to a minimum of 20 seconds.
- 6.4.7 Formation take-offs are restricted to elements of two aircraft.
- 6.4.8 Formation take-offs are only permitted when the runway width exceeds 125 feet.
- 6.4.9 Formation take-offs are not permitted when:
 - o Any member of the element is carrying live munitions other than air-to-air missiles, 20mm cannon rounds, 2.75 rockets, AGM-88, AGM-65 or night illumination flares.
 - O Standing water, ice, slush or snow is on the runway.
 - o The crosswind or gust component exceeds 15 knots.

6.5 En-Route

- 6.5.1 Flight Leads must maintain 350 KIAS until join-up is accomplished, unless mission requirements or flight safety necessitate a different airspeed.
- 6.5.2 Flight Leads must not exceed 30 degrees angle of bank until the formation is joined-up.
- 6.5.3 The default en-route formation is 'Finger Four' with number two joining on the left.
- 6.5.4 Flight Leads must not break up a formation until each member of the formation has some positive mechanism for navigation i.e. visual, radar ('TIED ON'), INS (panned route) or TACAN (including Radial).
- 6.5.5 The lead pilot within a formation must not be changed unless all members of the formation are in visual contact with each other.
- 6.5.6 Fingertip formation may not be used for low altitude flights below 300 feet. For flights at this altitude, flight members should adopt the 'fighting wing' formation.
- 6.5.7 For low-level flights, wingmen should never descend below the altitude of the flight leader and should remain on the outside of the formation from terrain.
- 6.5.8 In IMC, penetration should not be conducted in elements of more than two aircraft.
- 6.5.9 For night sorties, if formations other than fingertip or route are used, separation will be maintained primarily by instruments. If spacing cannot be ensured, vertical separation must be employed at a minimum height of 1,000 feet.
- 6.5.10 For night sorties, prior to a formation breakup, flight leaders will broadcast their attitude, altitude, airspeed and altimeter setting, which will be acknowledged by wingmen.
- 6.5.11 Overhead break recoveries must not be performed at night or in IMC.

6.6 Air-to-Air Refuelling

6.6.1 All members of a flight must complete the 'Before AAR' checklist as soon as is practicable after obtaining visual contact with the tanker.

6.7 Recovery

- 6.7.1 To minimise the likelihood of tail scrapes, the final approach will normally be flown at 11 degrees AOA.
- 6.7.2 Overhead break recoveries are not permitted with unexpended ordnance, other than air-to-air munitions, AGM-88 and AGM-65.
- 6.7.3 The break should be initiated at the touchdown point, or as directed by ATC.
- 6.7.4 The minimum separation during the break is 5 seconds.
- 6.7.5 Aircraft should roll out onto their final approach track at approximately 300 feet AGL and 1 mile from the planned touchdown point.
- 6.7.6 Formation landings are only permitted from a precision approach, or a VFR straight-in approach in day VMC. A qualified flight leader must lead formation landings, unless an IP is in the element.
- 6.7.7 Aircraft participating in formation landings must be symmetrically loaded.
- 6.7.8 Formation recoveries are prohibited when:
 - Any member of the element is carrying live munitions other than air-to-air missiles or 20mm cannon rounds.
 - Standing water, ice, slush or snow is on the runway.
 - o The crosswind or gust component exceeds 15 knots.
 - o The runway width is less than 125 feet.

6.8 Checks and Scans

Alpha Check

The Alpha Check provides a mechanism to ensure that all members of the flight have correctly configured a planned route and that associated mission related configuration has been conducted correctly.

- 6.8.1 Flight Leads must conduct an Alpha Check during the start-up process.
- 6.8.2 Flight Leads must declare the waypoint number, name or reference, the bearing to the waypoint and distance which may be rounded to the nearest nautical mile. Each member of the flight will respond with their position number in turn if correct, or "negative" if incorrect. Discrepancies should be corrected at the end of the alpha check.
- 6.8.3 Flight Leads should confirm that the correct JOKER or BINGO fuel setting is configured by each member of the flight.
- 6.8.4 Flight Leads must confirm that TACAN has been configured correctly by each member of the fight.

Ops Check

Ops Checks should be conducted sufficiently that the flight lead is able to ensure the safe accomplishment of a mission.

- 6.8.5 Ops checks are required:
 - o During climb or at level-off after departure
 - When external fuel tanks are emptied, if carried.
 - After each employment of air-to-surface munitions, where practicable
- 6.8.6 Minimum items to be checked are the engine instruments, total and internal fuel quantities and any errors or warnings.

7. Tactical Operations

7.1 AWACS Check-In

- 7.1.1 Where available, flights should check in with AWACS as soon as is practicable when entering the AO but no later than their designated check-in point (CP).
- 7.1.2 Flight Leads should ensure that authentication takes place when checking invia an insecure radio when required. If the flight is not authenticated by AWACS, the flight should authenticate the AWACS controller.

7.2 FENCE In

- 7.2.1 When directed, flight members should conduct their 'FENCE' checklist and respond to the 'FENCE in' directive with their fuel state.
- 7.2.2 Following fencing in, the flight should not alter formation unless otherwise briefed. The flight should maintain the previously held formation until directed.
- 7.2.3 The default tactical formation is line abreast at 1nm, adopted with the brevity directive 'GO TACTICAL'.

7.3 Sensor Employment

- 7.3.1 Unless otherwise briefed, flight members should enable their radar when fencing in.
- 7.3.2 The default search contract within each element is:
 - o Lead: Far, high
 - o Wingman: Close, low
- 7.3.3 Flight members should ensure that the vertical profile of their radar search overlap with each other to ensure no gaps in radar coverage.
- 7.3.4 Previously undetected groups that are detected by flights should be reported on the package working frequency/C2 frequency as soon as is practicable using the bullseye format.
- 7.3.5 Any directive to silence radar must be acknowledged by all flight members.

7.4 BVR Engagements

- 7.4.1 Unless otherwise briefed, the default sort contract within each element is:
 - Lead: Leader, left, high.
 - o Wingman: Trailer, right, low.
- 7.4.2 Flight members do not require authorisation to shoot against 'HOSTILE' contacts at the timeline shoot distance.
- 7.4.3 Against single targets, 'shooter cover' tactics should be used. The shooter must be nominated by the flight leader.
- 7.4.4 All weapons releases must be broadcast on the package working frequency and include:
 - The full call-sign of the launching pilot.
 - The type of weapons release (FOX-1, -2 or -3, including MADDOG).
 - o The flights' Bullseye reference.

7.5 ACM Engagements

- 7.5.1 Flights entering into an ACM engagement must declare 'MERGED' on the package working frequency/C2 frequency, along with their altitude.
- 7.5.2 Where practicable, the engaged and supporting fighters must be identified on the intra-flight working frequency.

7.6 Air-to-Ground Engagements

- 7.6.1 Whilst conducting air-to-ground engagements involving the use of targeting pods, the flight must be suitably deconflicted, either by altitude or with one pilot remaining 'heads-up'.
- 7.6.2 Pop-up attacks must be aborted if airspeed decreases below 350 KIAS.
- 7.6.3 For night operations, pilots must not exceed 135 degrees of bank when returning to low altitude following weapons deliveries.

7.7 Checks and Scans

- 7.7.1 Battle Damage Checks (BDC) are mandatory following any expenditure of ordnance, including the use of 20mm ammunition by cannon, and should be conducted as soon as is practicable.
- 7.7.2 Battle Damage Checks (BDC) and hung-ordnance checks should be performed before commencing RTB procedures.

8. Abnormal Procedures

8.1 Radio Failure

- 8.1.1 If a radio failure occurs in close or route formation, the pilot should manoeuvre into a position visible by the flight leader without compromising flight safety and maintaining separation from all other flight members and indicate NORDO by rocking the wings of the aircraftand enabling the formation lights. The mission should be terminated for the element containing the NORDO and the NORDO aircraft should be escorted to an appropriate landing base.
- 8.1.2 For radio failures outside of close formation, the NORDO pilot should attempt to join a route position approximately 500 feet from the closest flight member and 'porpoise' their aircraft. A flight member will acknowledge the NORDO indication by a wing-rock. The mission should be terminated for the element containing the NORDO and the NORDO aircraft should be escorted to an appropriate landing base.
- 8.1.3 NORDO aircraft should land in advance of the rest of the formation.
- 8.1.4 Aircraft must not expend munitions without two-way radio communication unless in self-defence.

8.2 Aircraft Defects

8.2.1 Detected defects which pose a risk to the conduct of the mission or to flight safety constitute an emergency and must be reported to the flight lead as soon as is practicable.

8.3 Hung Ordnance

- 8.3.1 If hung ordnance is detected, attempts should be made to release the munition using another delivery mode. If unsuccessful, attempts should be made to jettison the store using selective jettison procedures.
- 8.3.2 If ordnance remains hung, the aircraft should recover either to an alternate field, or be the last aircraft in the package to recover.

8.4 Battle Damage

- 8.4.1 If battle damage is suspected, a full BDC must be conducted.
- 8.4.2 If battle damage is suspected to be so severe that flight safety is compromised, the affected aircraft must terminate the mission and recover immediately. Where required, unexpended munitions may be jettisoned.
- 8.4.3 Any self-detected battle damage must be reported to the flight lead.

9. Emergency Procedures

- 9.1 Engine Failure
- 9.1.1 In non-tactical airspace, engine failures should be broadcast on an appropriate ATC frequency, including the full callsign of the affected aircraft and their intentions.
- 9.1.2 For engine failures in tactical flight, a single bullseye call should be made on the package working frequency, followed by a 'flow' direction. Aircraft should attempt to fly towards friendly forces and attempt an air start if practicable.

10. Mission briefing

10.1 Mission / Objectives

- What is the mission and its objectives.
- Participants

10.2 Friendly situation

- What are the big picture friendly situation
- Map
- FLOT

10.3 Enemy situation

- What are the big picture enemy situation
- Map
- Big picture threat information (map)

10.4 Flight overview / flightplan

- Map / waypoints

10.5 Flight admin

- Aircraft assigned, callsign, (parking) and pilot
- Engine start, taxi and takeoff times
- Rendezvous instructions

10.5.1 Weather data:

- Airfield
- Weather at target area

10.5.2 Flight Info:

- Rollcall
- Internal frequency
- Intra-flight TACAN frequency
- Datalink settings
- Loadout
- Lasercodes
- Briefing time
- Pit time (Step time)
- Check-in time
- Expected taxi time
- Expected take-off time

10.6 Departure

- Type of taxi
- Type of takeoff (rolling, formation, trail)
- Rejoin procedures and formation
- Numbers (Rotate/rendezvous altitude, heading, speed)
- Join up formation
- Expected systems / OPS check

- Aborted take-off procedure
- Emergency after take-off procedure

10.7 Enroute

- Bullseye
- Altitude
- Airspeed
- Formation
- Push times
- Details of all agencies that are to be interacted with (Callsign, frequency, role)
- Any requirements for radio silent / EMCON procedures
- Radio failure procedures and contingencies

10.8 Tanking

- Tanker Callsign
- Track/anchor
- Altitudes
- Times
- Onload
- Night/IMC/Breakaway
- Reform
- Contingencies

10.9 Fuel Management

- Bingo
- Joker
- Fuel awareness
- Afterburner use and restrictions
- Considerations

10.10 RTB

- Rejoin formation
- Operational checks
- Battle Damage Assessment
- Expected recovery type
- Alternate field (TACAN / ILS / FREQ)

10.11 Contracts

10.12 Mission specifics:

10.12.1 Air to Air Threats

- Enemy fighters
- Weapons available to the enemy fighters including known: Range /accuracy / tactics to defend against the weapon

- Enemy airborne detection and control systems like AWACs etc
- Airborne traffic that may pose a collision risk like friendly or enemy helicopters, drone, or strike aircraft operating in the AO.
- NO-GO areas due to A-A threats

10.12.2 Surface to Air Threats

- Known SAM systems operating in the area
- Known MANPAD systems operating in the area
- Known anti-air artillery systems operating in the area
- Tactics to defend against the weapon
- Tactics to avoid the weapon
- Known safe routes both into and out of the AO
- NO-GO areas due to S-A threats

10.12.3 Air to Ground

- Gameplan
- VUL time (Vulnerability time = on-station time)
- Target assignments
- DPI / DMPI (DPI=Desired Point of Impact, DMPI=Desired Mean Point of Impact)
- Initial Point (IP)
- Key locations
- Civilian considerations
- Ordnance
- Weapon profiles (Release number, dive angle, safe escape maneuvers (SEM) Burst altitude, Lasercodes)
- Delivery method (CCIP, CCRP, Level/Dive/Toss, Single/multiple attack runs, release parameters, Drop/no-drop)
- Egress
- Off target rejoin
- Contingencies

10.12.4 Air to Air

Air to Air mission

- HAVCAP, CAP, SWEEP / ESCORT
- Mission / HAV asset / Mission specific assets / Sweep coordinates (area) / Escorte asset
- Station time

Air to Air Game plan

- Tactical formation and contract speed
- Responsibilities
- Sorting responsibilities
- Radar scan
- Contract ranges
 - o Commit distance in nm
 - Sorting distance (nm)
 - Shoot distance (nm) (dependent on strategy and mission)
 - Out distance (nm)
 - Decision Range (DR)
 - Minimum Abort Range (MAR)
- Abort / Skate / Banzai
- "Green zone" / Safe zone / Safe area

10.13 Training Range

- Desired learning objectives
- Target / Range description
- No go areas
- Weapon safety restrictions
- Human factors like GLOC, channelised attention, task saturation, correct prioritization
- Avionics switch positions / mission computer setup
- Weapon employment restrictions
- Radio procedures
- Expected hold areas
- Expected hold formation
- Deconfliction rules, restrictions, and requirements
- Expected sequence of events
- Target area pattern procedures
- Downwind flight parameters
- Radar setup
- Roll-in position, direction, altitude
- Parameters for final
- Safe escape parameters, minimum altitiudes
- Crosswind leg, altitudes, airspeeds