NTTR-BFM-Trainer -- NOTAMS (Notices to Airmen)

Introduction

Welcome to Nellis Air Force Base for this cycle of BFM (Basic Fighter Maneuvers) training.

Along with the Mission Briefing, this document will provide all the information required for participation, including airspace information, recommended procedures, and other data to help you safely fly, and succeed, in your training.

This exercise is all about 1v1 aerial combat. By default, the weapon of choice is guns only. You will fly sorties for Blue Forces (BLUEFOR), or Red Forces (REDFOR) using a selection of 14 available Player Aircraft. At this time, the available pilotable aircraft for both sides are:

Western Aircraft (USA/NATO): F-86 Sabre, F-5E Tiger, F-14B Tomcat, F-15C Eagle, F-16C Viper, F-18C Hornet, Mirage 2000.

Eastern Aircraft (Warsaw Pact): MiG-15 Fagot, MiG-19 Farmer, MiG-21 Fishbed, MiG-29 Fulcrum, Su-27 Flanker, Su-33 Flanker-D, JF-17 Thunder.

Your opponent would typically be either: Another human pilot flying for the other side in one of the above aircraft in a multiplayer (MP) setting, or a computer generated AI ace pilot flying for the other side in single player (SP) mode. The AI will fly one of 17 fighters, including those 14 aircraft listed above, along with the F-4E Phantom, MiG-23 Flogger, or JF-11 Flanker-L. Additionally, a small handful of unarmed AI aircraft are also available for escort, or risk free interception and target practice.

All human pilotable aircraft will originate out of Nellis. Since this is a BFM exercise, all aircraft will be armed *only* with guns. For certain aircraft, additional fuel tank(s) may also be provided. At the pilot's discretion, aircraft may be rearmed as desired at certain satellite airports (discussed in the Airspace section). Nellis, however, will provide NO re-fueling or re-arming services once a mission is underway.

Most aircraft will require the pilot to perform a Cold Start. However, in certain cases (F-86, F-5, F-14, and MiG-15) ground personnel will pre-start those aircraft that require external services (Electrical or Air).

Once airborne, all aircraft will proceed to their desgnated areas prior to initiating any combat operations. These areas will be discussed in the Airspace section.

Airspace Information

During this exercise, five airspace areas have been designated as shown in Figure 1.

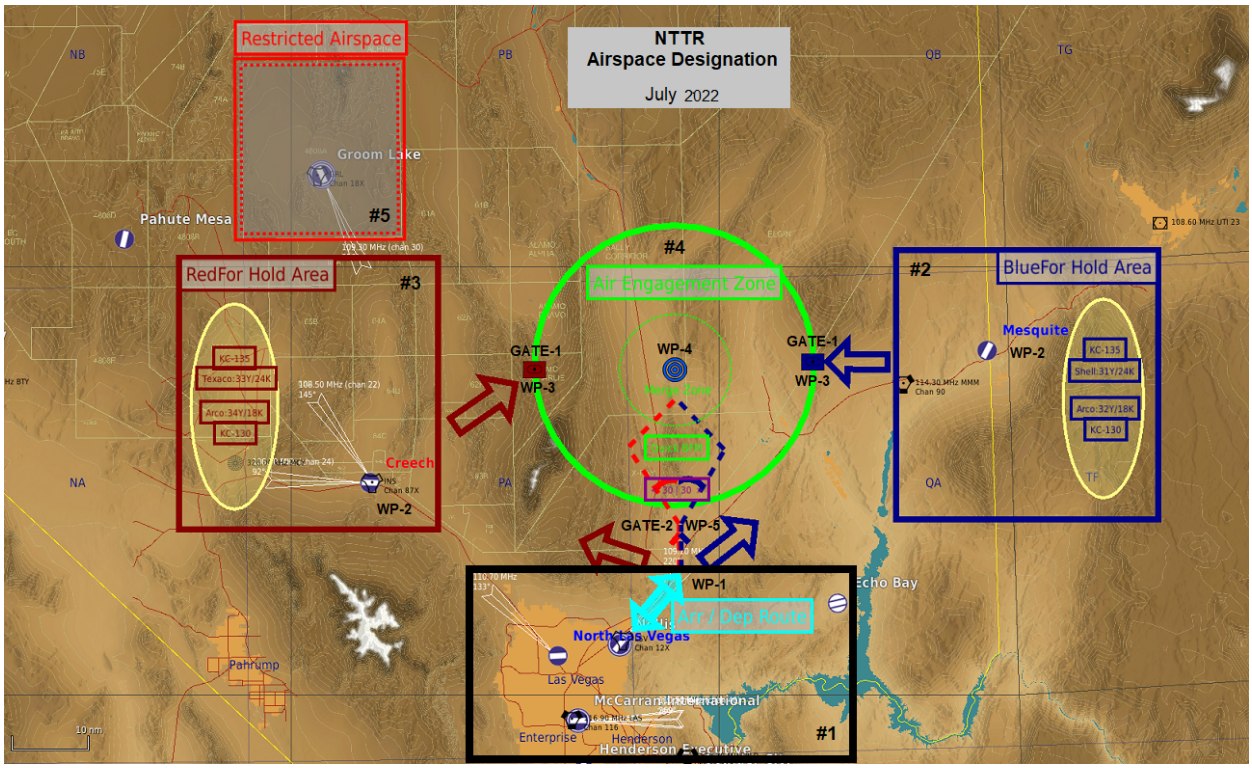

Figure-1

These areas are:

#1: Nellis / Las Vegas: This is the area around Nellis AFB, and includes the airbase itself, North Vegas Airport, the city of Las Vegas, and the arrival & departure corridor to the range.

Participating aircraft are *only* authorized for flight operations into and out of Nellis AFB, North Vegas airport, or the corridor between Nellis and designated range waypoint WP-1.

Due to noise abatement agreements, all participating aircraft should remain at, or north of, those two airports and avoid any flight below 1500' AGL, except as necessary for takeoffs or landings at those facilities. Figure-5 and Figure-6 shows key information for Nellis AFB, and North Vegas Airport respectively.

#2: Blue Forces Holding Area (BHA): This area serves as the combat staging and free flight area for all BLUEFOR aircraft. All standard flight operations are permitted within this area (except combat ops).

As noted in Figure-1, two air-to-air refueling tankers are available for use. The KC-135 will provide fuel to aircraft using a boom probe, and the KC-130 will service aircraft requiring a drogue basket. Their flight tracks (yellow arc), altitudes, tacan, and comms data are listed on the map. Mesquite Airport (WP-2) will provide full fuel, arming, and repair services for all BLUEFOR aircraft (See Figure-7 for information about Mesquite Airport).

While inside the BHA, the pilot may trigger a combat engagement using the **Radio Menu** and selecting the **F10 Other** option. A menu will appear listing four categories of air targets. They are: USA/NATO, Warsaw Pact, Unarmed Guppies, and Random AI Fighter. The first two options correspond to the aircraft discussed previously (see Introduction). The third option has a small list of unarmed transports and drones that can be spawned as intercept targets. The fourth is a random selection of one of the 17 AI fighters. The selected aircraft will spawn and proceed into the AEZ where it can be engaged.

<u>Airspace Information</u> (continued)

#3: Red Forces Holding Area (RHA): This area serves as the combat staging and free flight area for all REDFOR aircraft. All standard flight operations are permitted within this area (excluding combat ops).

As noted in Figure-1, two air-to-air refueling tankers are available for use. The KC-135 will provide fuel to aircraft using a boom probe, and the KC-130 will service aircraft requiring a drogue basket. Their flight tracks (yellow arc), altitudes, tacan, and comms data are listed on the map. Creech AFB (WP-2) will provide full fuel, arming, and repair services for all REDFOR aircraft (See Figure-8 for information about Creech AFB).

While inside the RHA, the pilot may trigger a combat engagement using the **Radio Menu** and selecting the **F10 Other** option. A menu will appear listing four categories of air targets. They are: USA/NATO, Warsaw Pact, Unarmed Guppies, and Random AI Fighter. The first two options correspond to the aircraft discussed previously (see Introduction). The third option has a small list of unarmed transports and drones that can be spawned as intercept targets. The fourth is a random selection of one of the 17 AI fighters. The selected aircraft will spawn and proceed into the AEZ where it can be engaged.

#4: Air Engagement Zone: This is a 35 nm diameter circle of airspace north of Nellis. It is the ***only*** area authorized for air combat operations. It is located directly between the holding areas for both opposing factions. Bullseye for both sides is located at the center of the zone. Slightly west of bullseye, Range Control Staff are stationed at an abandoned dirt airstrip providing control and telemetry monitoring for the exercise. Immediately surrounding the Bullseye is the Merge Zone. This area is approximately 12 nm in diameter and serves as the merge / meeting point for adversary aircraft prior to an engagement.

As mentioned previously, in SP mode, combat engagements are initiated using the Radio Menu (and F10 Other) option from inside the holding area to select an AI opponent. Both the player and the AI should head for their respective AEZ entry points (WP-3 / GATE-1). Aircraft will be visible on the Mission Map (F10), so pilots may find it helpful to check that to help ensure both aircraft will converge in the Merge Zone at the same approximate time. AI aircraft will typically enter the AEZ at, or around, 20,000' MSL. Once both aircraft have merged successfully, Range Control will issue the “Fight's ON” message indicating that combat may commence. After the merge, the entire area of the AEZ may be used for the fight. Please note that Unarmed Guppy aircraft will not generate a “Fight's On” or, KIO call.

Once one of the combatants is defeated, Range Control will issue a “Knock it Off!” call (KIO). At that point, the AI (if it wins) will be despawned. If the pilot wins, they should disengage and exit the AEZ. If the pilot wishes to stage another engagement, they should exit the AEZ via GATE-1 / WP-3, and proceed to WP-2 to select another opponent. If the pilot wishes to RTB, they should exit the AEZ via GATE-2 / WP-5 and follow the arrival procedures back to Nellis (see Airport Procedures).

Within the AEZ, a pilot may also issue a “Knock it Off!” call using the Radio Menu (F10 Other) option. This could be for any of several reasons; bingo fuel, winchester ammunition, an AI that fails to engage, or departs the AEZ, etc. Again, with a pilot KIO call, any AI opponent will be despawned allowing the pilot to deal with whatever situation lead to the call.

In the case of two human pilots in an MP environment, it is assumed that the players are communicating via Teamspeak, Discord, or some other means. MP players may follow the above sequencing from WP-1 --> WP-2 --> WP-3 --> WP-4 as SP mode uses or, they may use the Quick BFM route. In this case, pilots would fly (typically together in formation) to WP-1 and then proceed to WP-5. Once reaching WP-5, they should turn 30 degrees away from each other to separate. After a mutually agreed gap, they may turn back in to commence the fight at both pilot's discretion. Depending on proximity to the Merge Zone, a “Fight's ON” call may, or may not, be issued. Once a combatant has been defeated, the surviving pilot may return to their WP-2 airport to refuel and rearm, or RTB to Nellis via GATE-2 / WP-5, following the Nellis arrival procedure. Pilots should agree beforehand on how KIO calls should be handled, and whether game labels (On by default) should be used or not.

<u>Airspace Information</u> (continued)

Groom Lake / Area 51: The area around Groom Lake is both classified and restricted.

NO aircraft operations are expected or permitted in this airspace by aircraft participating in this exercise. Aircraft entering this zone could potentially be considered hostile and be fired upon (Note the Hawk SAM installation on your EWR).

Finally, before you ask, "No, we do *not* have any credible information regarding extraterrestrials, UFOs, otherworldly technologies, or space craft - don't believe everything you see on The History Channel...".

Waypoints: Each pilotable aircraft (that can use them) has five waypoints assigned. Three of those are common to all aircraft; WP-1, WP-4, and WP-5. These are the range entry point, the Bullseye, and the range exit point (for aircraft returning to Nellis). WP-2 is the location of the service airport within each holding area (Mesquite for Blue forces, and Creech AFB for Red forces). WP-3 is the GATE-1 combat entry and exit point for each faction (see Map, Figure-1) during single player combat operations.

For early era aircraft without waypoint navigation equipment, pictures of the three common waypoints are provided below to help pilots familiarize themselves visually with the training range.

WP-1 Garnet: Located approximately 12.5 nm northeast of Nellis AFB, this is the approved entry point for flight operations into the training range area. All airspace north of Garnet is considered part of the training range.

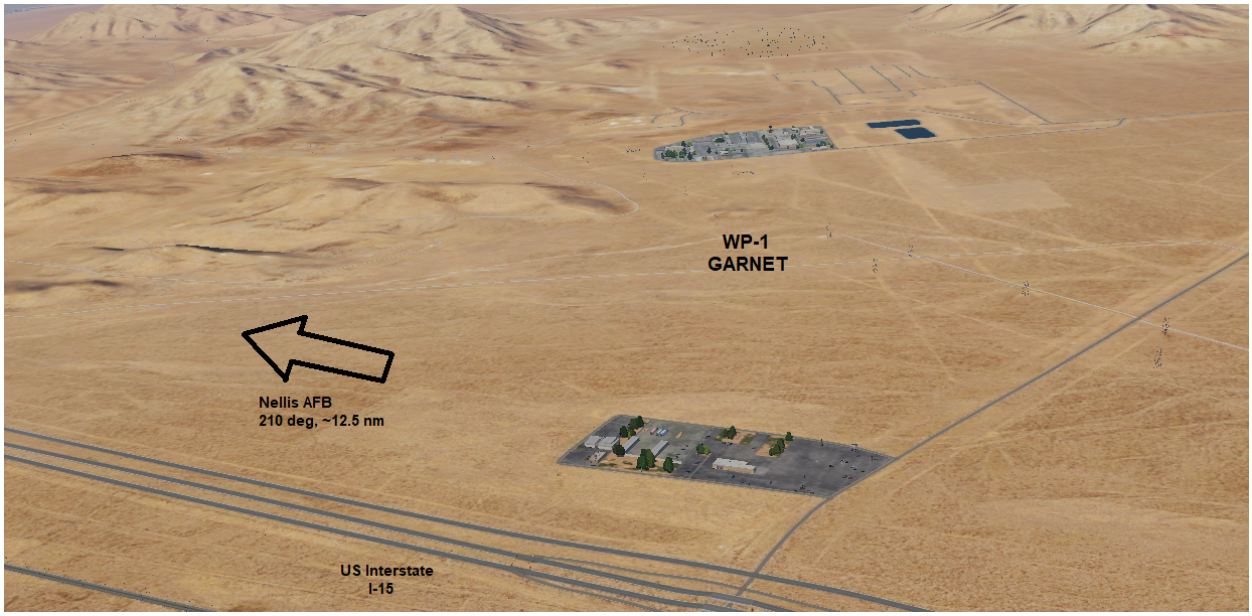

Figure-2

Airspace Information (continued)

WP-5 GATE-2 / Dry Lake: Located just a few miles north of Garnet at the southern end of the AEZ, Dry Lake is the approved AEZ entry point for multiplayer flight operations into the training range using the Quick BFM route. It is also the approved AEZ exit point for all flights leaving the AEZ returning back to Nellis AFB.

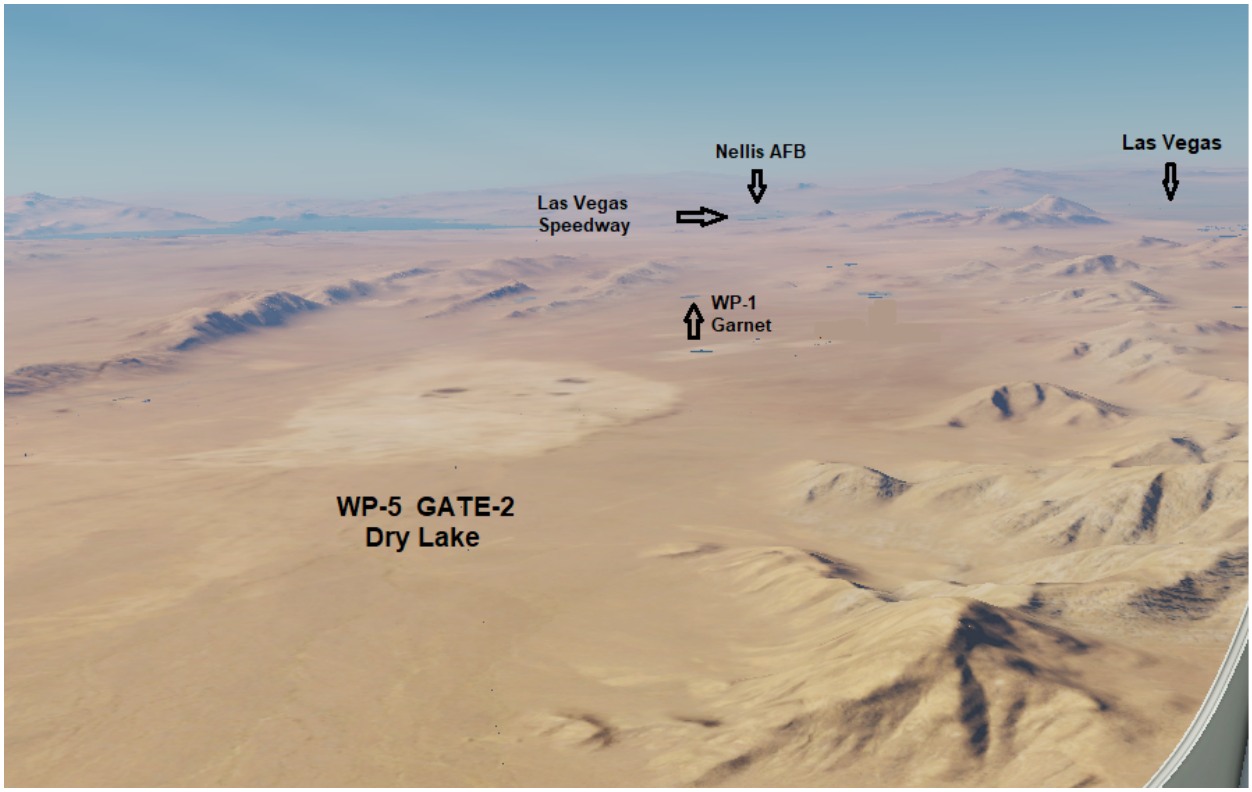

Figure-3

WP-4 Bullseye / Range Control: Located in the center of the AEZ is the Bullseye position for each faction. It is also centered within the AEZ Merge Zone and represents the meeting point for 1v1 combat engagements. Just a few miles (~3 nm) west of the bullseye is the Range Control station where on-site staff track and monitor combat activity during the exercise.

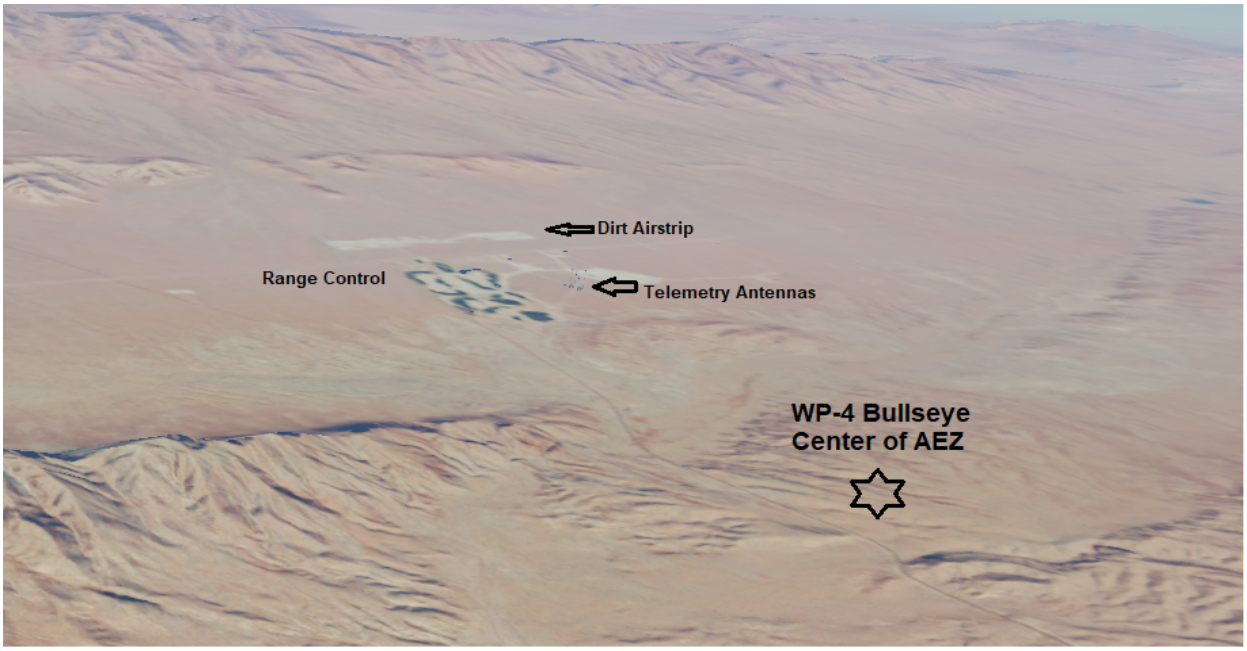

Figure-4

Airport Procedures and Information

There are four airports supporting this exercise. Pictures and procedures for each will be detailed here.

Nellis Air Force Base (LSV): This is the origination point of all pilotable aircraft flown in the exercise. Several areas of interest are noted in Figure-5. Please take note of parking areas, and taxiway closures.

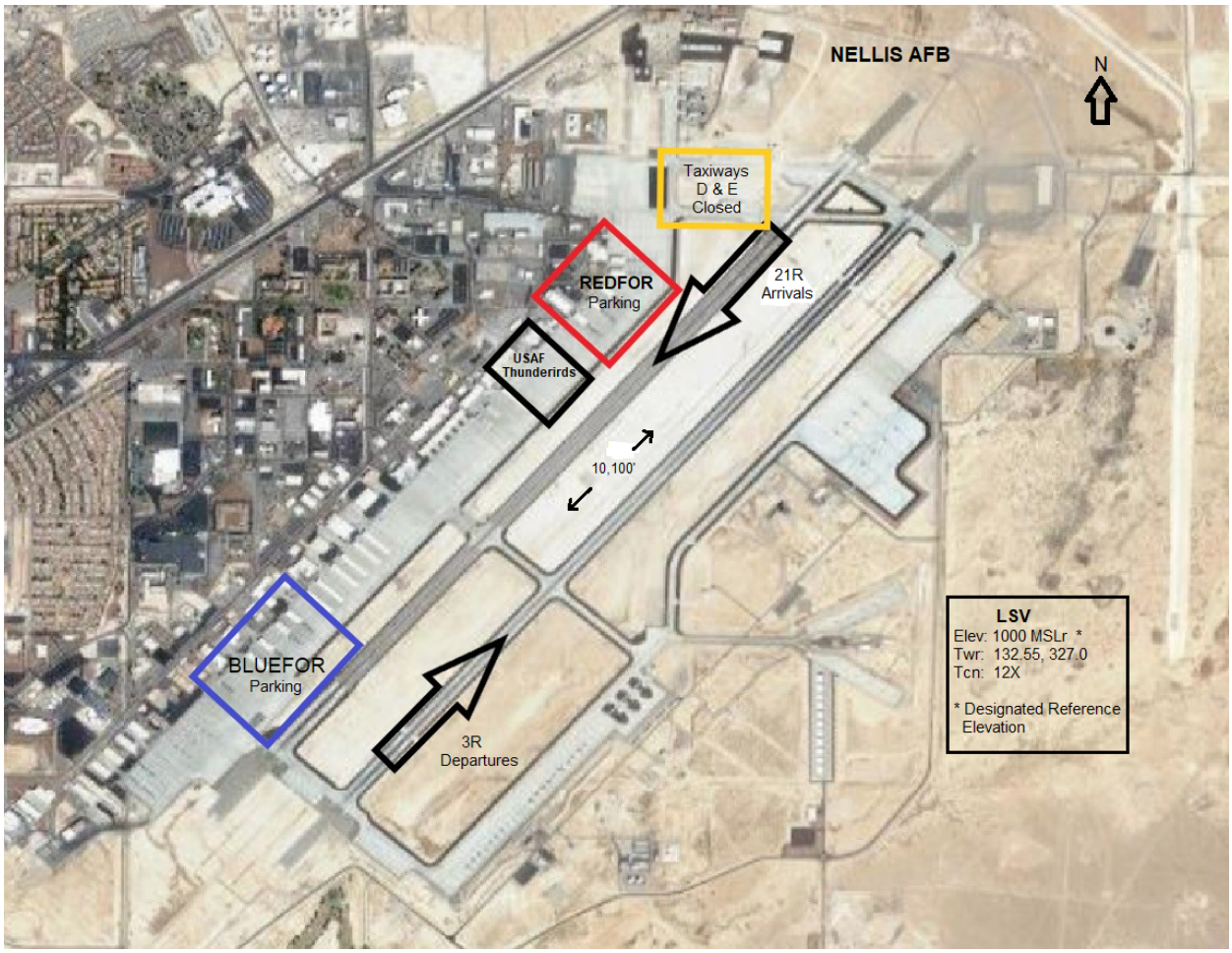

Figure-5

- **No** re-arming or re-fueling services are available at Nellis during the exercise. Cold Starts are expected for all aircraft except those (F-86, F-5, F-14, Mig-15) needing external services (Air or Electrical). Those aircraft will be Hot Started by ground crew prior to flight.

- By default, Game Labels are (intentionally) ON. Experienced veteran and multiplayer pilots may choose or agree to shut these off by cycling the LShift-F10 key (DCS default) as necessary.

- Since all flight operations will occur within ~50 nm of Nellis, a specific altimeter reference value will be used for this exercise. Altimeters for all participants should be set to 29.03 in/hg (ie. Nellis reference elevation of 1000') regardless of the current barometric pressure value (see Appendix – About Altimeters).

- All other exercise altitudes will be based on the noted reference value, and be denoted with an "r" (ie. 8000' MSLr) in this document.

- Noise abatement procedures are in effect for Las Vegas, and the areas surrounding Nellis. All aircraft should remain at, or above, 1500' AGL (ie. 2500' MSLr) except as necessary for takeoffs and landings. Airspeeds should also not exceed 350 kts in these areas.

<u>Airport Procedures and Information</u> (continued)

Nellis Departure Procedures:

- All departing aircraft should expect Runway 3R for takeoff.
- Upon takeoff, fly runway heading for ~12.5nm to WP-1 GARNET.
- Cross GARNET at, or above, 8000' MSLr.
- Proceed to WP-2 (or optionally, to WP-5 GATE-2 in Multiplayer Quick BFM mode).
- Climb to combat altitude (typically ~20,000' MSL) is approved.

Nellis Arrival Procedures:

- All arriving aircraft should expect Runway 21R for landing.
- From AEZ, Exit via WP-5 GATE-2 (Dry Lake).
  Cross DRY LAKE at, or below, 6000' MSLr.
- From BHA or RHA, intercept the exit route from WP-2 to WP-1 GARNET.
  Cross GARNET at, or below, 6000' MSLr.
- From DRY LAKE or GARNET, follow US Interstate 15 south for visual approach into Nellis AFB.
  Approach may be straight-in or involve a Military Overhead Break pattern.
- **Military Overhead Break Pattern:**
  * Due to Noise Abatement Procedures, all MOBPs should occur at, or above, 1500' AGL (ie. 2500' MSLr) at airspeeds of 350 kts, or less.
  * Pilots should commence a right-hand break as soon as they reach the threshold of Runway 21R.
  * The outbound (downwind) leg of the break should be flown West of Las Vegas Speedway.
  * The base leg turn may commence once you are fully North of the Speedway.
  * The final approach leg into Nellis at that point will be approximately 3-4 nm till landing.

Airport Procedures and Information (continued)

North Las Vegas Airport (VGT): This airport is located approximately 7.5 nm West of Nellis. It serves as a satellite airport for BLUEFOR aircraft. Full fuel, re-arming, and repair services are available for them. Be advised that some aircraft (ie. F-15) may not be re-armed unless engines are shut down first.

Figure-6

- Arriving aircraft should expect Runway 25 for landing, however, Runway 12R may also be used at pilot's discretion, as it's also the same length, and may be slightly more convenient.
- Departing aircraft may use Runway 30L for takeoffs.
- Due to Noise Abatement procedures, all traffic should remain above 1500' AGL and slower than 350 kts except as necessary for takeoffs and landings at North Vegas airport.
- NOTE: Runways at North Vegas are ~1/2 the length of the runways at Nellis. Appropriate care should be taken during Takeoffs and Landings here.

Airport Procedures and Information (continued)

Mesquite Airport (67L): This airport is located within the BLUEFOR Holding Area (BHA) at WP-2 and serves as the primary satellite airport for them. It offers full fuel, re-arming and repair services for all BLUEFOR aircraft participating in this exercise. Be advised that some aircraft (ie. F-15) may not be re-armed unless engines are shut down first.

Figure-7

- There is NO tower or ATC services available at Mesquite Airport. Flight operations are at pilot's discretion.
- Due to sloping terrain north of the airport, it is recommended that all participants use Runway 02 for all arrivals and departures.
- NOTE: The runway at Mesquite is ~1/2 the length of the runways at Nellis. Appropriate care should be taken during Takeoffs and Landings here.

Airport Procedures and Information (continued)

Creech Air Force Base (INS): This airport is located within the REDFOR Holding Area (RHA) at WP-2 near the town of Indian Springs. It serves as the primary satellite airport for them. It offers full fuel, re-arming and repair services for all REDFOR aircraft participating in this exercise. Be advised that some aircraft (ie. F-15) may not be re-armed unless engines are shut down first.

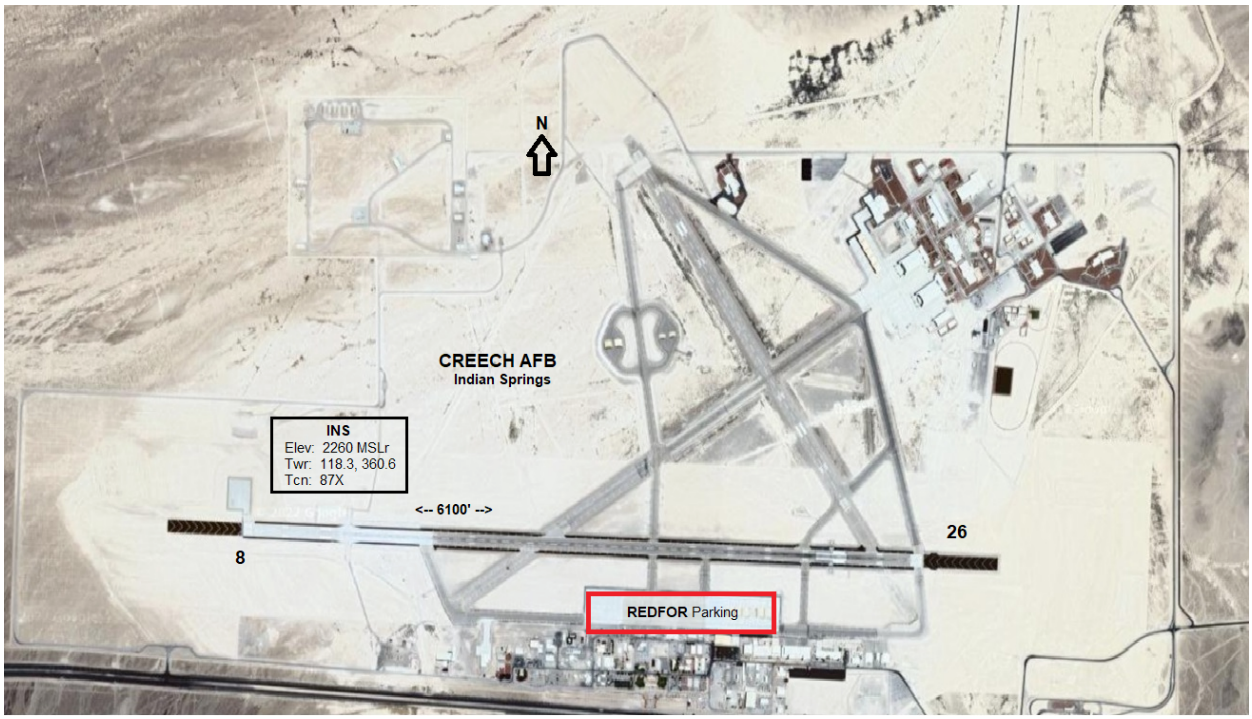

Figure-8

- Aircraft should expect Runway 8 for both arrivals and departures.
- NOTE: Runways at Creech AFB are shorter than the runways at Nellis. Appropriate care should be taken during Takeoffs and Landings here.

Appendix and Additional Information

Disclaimers

This document is solely intended for use by game players of the Digital Combat Simulator (DCS) game. It is NOT in any way intended to convey real world procedures, and indeed, has NO bearing in actual reality whatsoever.

This material is intended hopefully, and only, to help improve the video game simulation experience by providing some (possible, plausible?) flavor and immersion for the players as they play this mission.

Nothing in this document is intended to be taken seriously outside of the DCS Environment (and not particularily seriously within that environment either).

Honestly, Just Have Fun with it!

FourSpeed – July 2022

About Altimeters

An altimeter is a basic device that measures height above some fixed level (usually sea level or ground level). Most older altimeters are aneroid barometers that are calibrated to display simple air pressure as an estimate of altitude. While subject to certain types of errors (beyond the scope of this section), they function well enough to be used in many applications (including airplanes).

By far, the most common use in aircraft is to show its height above Mean Sea Level (MSL). Aviation charts show MSL altitudes for airports, terrain, and various obstacles, and air traffic controllers will give you the current pressure for their area when contacted by radio. Setting that value in the altimeter should then match the chart values for the area you're flying in, which is quite helpful for longer distance flights where weather conditions are likely different than they were at your original airport.

Another way to set the altimeter is by reference (pressure or elevation). For instance, in North America, for all flights above 18,000' MSL, it is set to 29.92 in/Hg regardless of the actual barometric pressure. Less commonly, for local area flights, the altimeter is often set to show a ground level of zero (whatever pressure setting that happens to be). Skydivers, some airshow performers, and crop dusters may do this since it's convenient, and conditions are less likely to change much during their flight.

In this BFM exercise, since all flights begin and end at Nellis and stay within ~50 nm, the reference method for altimeter setting is being used (mostly for flavor; see Appendix – Disclaimers). Unfortunately, some DCS aircraft cannot set an altimeter elevation of 0' AGL for Nellis, so the arbitrary value of 1000' was chosen. Other range altitudes assume that reference is in place, and denote altitudes based on it using an “r” (ie. 8000' MSLr, assuming you set the field elevation at Nellis to 1000').

Appendix and Additional Information (continued)

BFM Combat Tips

While dogfighting is often much more complex to explain than this space allows, there are a few basic axioms that seem relevant and timeless, from the WWI days, through WWII, Korea, Vietnam, and even today:

- Know the aircraft you're flying - Exceeding its capabilities can lead to: structural failure, stalls, spins, reduced or sluggish performance, etc. ALL of these are Bad and will hinder your success. There is no substitute for "Time in Type" (ie. Lots of flight experience in your bird of choice) and understanding exactly what it can do well, and perhaps more importantly, what it cannot.

- Know the aircraft the enemy is flying – Understanding some basics about the enemy can help you exploit its limitations, or match the strengths of your aircraft against weaknesses of theirs.

- Keep the enemy in sight at all times! "Lose sight, lose the fight" is as old as combat aircraft themselves. In jets, that is especially difficult as they can travel substantial distances relatively quickly. In addition to your eyes, use your aircraft's systems (radar, EWR, helmet sights, etc.) to help, but make sure you don't lose track of the enemy. (I know: Easy to Say, Hard to Do).

- Manage your aircraft's Energy State - "Speed is Life". In this case, airspeed, and altitude are valuable commodities. Don't give them up easily, as they are large factors on what your aircraft can do, and how it can maneuver and perform. On the flip side, making the enemy spend those commodities more quickly than you do is one way to gain the advantage.

- Use the environment to your advantage. While more for MP players than SP vs AI, be aware that you can be as difficult for them to see as they are for you. Ground clutter, mountains, the sun, and clouds can all help you cause problems for the enemy. Used tactically, these may help you gain enough advantage to get that crucial first shot.

- Shoot when you see the whites of their eyes! Ok, don't take that literally. However, ammunition is quite limited, so DON'T shoot ***unless*** you're close enough that hits are assured, or at least, very likely. Use short bursts, and understand your gunsights and leading the target. Distance and Accuracy definitely matter.

- Learn, Learn, Learn! In addition to these basic tips, there are plenty of sources of information, be it books, videos, forum boards, or even pilot chatter that can help you increase your understanding of BFM. At very least, get familiar with basic concepts like: pursuit curves, One and Two Circle engagements, weapons zones, corner speeds, etc. The information is out there, but it's on you to root it out, make it your own, and use it to improve your skills. Even getting shot down in this exercise is a way to evaluate and assess your mistakes so that you'll be a better pilot next time.

- Finally, Know When to Give it Up. It does little good to shoot down the enemy, only to run out of fuel two minutes later, or follow them down in that power dive only to crash into the terrain if you can't pull out in time. In short, don't turn a bad situation into a fatal situation. Sometimes, a Knock it Off call is the right call. If the situation becomes unneccesary or unsafe, a KIO will let you re-assess, and hopefully do it better next time.

Appendix and Additional Information (continued)

Glossary

Here's a simple listing of various terms and abbreviations used within this document.

AEZ	Air Engagement Zone – the airspace area where combat is allowed within the mission.
AFB	Air Force Base.
AGL	Above Ground Level – the height of an aircraft above the ground surface beneath them.
AI	Artificial Intelligence – ie. A computer generated and controlled opponent.
ATC	Air Traffic Control – personnel involved in controlling aircraft operations at airports or enoute during flight.
BFM	Basic Fighter Maneuvers – ie. 1v1 dogfighting.
BHA	Blue Forces Holding Area – Free fly zone for aircraft of the Blue faction.
BLUEFOR	The designation for all assets of the Blue Forces faction (USA/NATO).
BULLSEYE	A specific map location used as a reference point for aircraft.
DCS	Digital Combat Simulator.
EWR	Early Warning Receiver – an aircraft instrument that detects hostile radar signals
IN/HG	Inches of Mercury – the measurement unit used by most US altimeters to derive altitude.
KIO	Knock It Off – A radio call intended to halt an air combat engagement.
KTS	Knots – a measurement unit used to specify airspeed (ie. Nautical Miles per Hour).
MOBP	Military Overhead Break Pattern – one type of landing approach for military aircraft.
MP	Multiplayer – a game mode where multiple players can fly together in a game server.
MSL	Mean Sea Level – the height of an aircraft above sea level.
MSLr	Mean Sea Level by Reference – the height of an aircraft above sea level adjusted for a specified reference elevation or pressure setting.
NATO	North Atlantic Treaty Organization.
NM	Nautical Miles – a unit of distance measurement.
NTTR	Nevada Test and Training Range.
REDFOR	The designation for all assets of the Red Forces faction (USAF Aggressors)
RHA	Red Forces Holding Area – Free fly zone for aircraft of the Red faction.
RTB	Return to Base.
SAM	Surface to Air Missile.
SP	Singler Player – a game mode where a player flies missions alone (ie. not in a server).
UFO	Unidentified Flying Object – not necessarily an alien spacecraft, but it could be...
US / USA	United States of America
USAF	United States Air Force.
WP	Waypoint – a specific location used by aircraft for navigation.
WWI	World War One
WWII	World War Two