

Scenario Description

This scenario is designed to help new players understand the methods and nuances of Air-to-Ground bombing. Bombing in today's air forces doesn't carry the same glamour as the Air-to-Air (A2A) missions, but once the "Glamour Jockeys" get off their shining white chargers and realize that the world does not revolve around White Knights rescuing damsels in distress anymore, they recognize delivering ordinance to surface targets is why they exist. Disparagingly called "Air to Mud" or "Farming", Air-to-Ground targeting is generally of two types: Close Air Support (CAS), where ground troops are involved, or strike, where targets are located and destroyed independent of ground forces. There are several sub classes of each type, but we will focus on simple Strike missions with one aircraft each.

Most modern fighters are called "multi-role", indicating that they can do both the Air-to-Air role in an effort to gain air superiority and the Air-to-Ground role to strike ground targets. Some aircraft, such as the F-15C or the MiG-31 are strictly A2A. While some other aircraft are strictly Air-to-Ground, such as the A-10 or the Su-25, these "flying tanks" are largely focused on CAS with troops in close contact.

Today, we will use the F-16, one of the most prolific and versatile modern aircraft in use today. One could make a serious study of the various types of F-16 out there, but it is not important to this tutorial. The model chosen has the ability to use a wide range of munitions to demonstrate the game functions needed. If you wish to know more, you can always go [here](#).

Don't worry, in future tutorials we will use other aircraft of Russian, European or Chinese manufacture so you can get used to these as well.

Enter the game and look around. You have an air base in Mali, and some targets all nicely lined up for you. There are no defenses arrayed against you in this scenario, so you are free to play around without getting shot at.

Enjoy learning this impressive game.

Note: This tutorial should take about 30-40 minutes to complete.

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Scenario Briefing

Good morning. You are the Squadron Commander of Blue Strike Squadron, and your job today is to learn how to use your assets in strike missions. Remember, CMO is not a flight simulator. It is a "tactical/operational command" simulator that replicates that tactical employment of modern air and naval forces, so you don't actually fly the aircraft. You're the boss, you tell the pilot what to do and s/he goes off and does what you tell them. Unless something goes wrong, or the situation changes of course then they have this desire for self-preservation! What is this world coming to!

You have a squadron of 12 F-16s, very handy little aircraft indeed. If you're interested in facts and figures that's about \$2 billion US worth of airframes at about 165 million, each. And don't forget that you will be spending \$34,000 per aircraft flight hour. The munitions you're dropping range in price from about \$2000 for a Mk 82 dumb bomb to about 1.5 million for a JASSM.

Open the game and review your forces. Each of your F-16s is loaded with a different loadout, we will practice with most of the available loadouts to give you a feel for which ones to choose in a real game. Munitions selection is one of the most important decisions a player will make, and it is expensive in time if you get it wrong. Hopefully this tutorial will help you with that. We will not be using the A2A loadouts as there are other tutorials covering that aspect, we're doing real work in this tutorial. We are limiting ourselves to ground targets, although "surface" also includes ships, that will be the subject of another tutorial. And finally, we will not be conducting SEAD (Suppression of Enemy Air Defense) which is a specialized skill set and will also be covered later.

A message will appear in about 15 seconds with instructions for your first strike.

Note: Modern aircraft generally don't fly alone, they like the company of a wingman. This goes to that very inefficient principle of self-preservation again! Anyway, in this tutorial we will be flying single aircraft "One Ship", where most missions you conduct in the game will be in "two ship" or even "four ship" formations. Don't ask me why they call them ships, something to do with that knight on a white charger thing I'm sure.

Strike 1 Message

Let's Check out your first strike Aircraft. (Strike #1) Select the "Blue Base" and either press the "F6" key or push the "Aircraft" on the "Unit Status" panel.

Strike #1 is an F-16 loaded with 6x Mk82 LDGP (Low Drag General Purpose). If you delve into the database, you will note that this bomb was first put into action in 1954, a lot has changed in bomb design since then.

You will also note that:

- Range against Anti-surf(surface) targets is 1nm or 1 Nautical Mile, that is right on top of the target.
- Launch Altitude is anywhere between 800ft AGL (Above Ground Level) and 65000ft AGL, quite flexible.
- This is a 500-pound(241Kg) GPB (General Purpose Bomb).
- Surface PoH (Probability of Hit) is 99%, that is good so it will probably hit the ground, not necessarily the target.
- The CEP (Circular Error Probability) means that it will likely hit within 50 Meters of where it is aimed but you're aiming it with the entire aircraft, it is not a precision weapon.
- If you hit your target, you will do 130.5 DP (Damage Points). DP is a game abstract to measure a targets ability to absorbed damage verses a weapons ability to deliver that damage.

Your target, Target 1, is a guard post. Checking the Database, you will note:

- This is a building, OK.
- It has 25 DP, so if you hit it, you should kill it with your bombs which do 130 DP each.
- It has light armor, which should not be a problem for your bombs.
- It is a 20x20 Meter target giving a target area of about 400 Square Meters.
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Launch Strike #1 by either right clicking on the aircraft and selecting "Launch Individually" from the drop-down menu or by clicking the "Launch Individually" from the options along the bottom of the "Air Ops" menu.

Strike 1 Target Message

Once Strike #1 is in the air, you can get him targeted quite easily.

- Select the aircraft Strike #1.
- Hit the "F1" key.
- Select Target 1.

You can do this through the Unit Orders Menu as well:

- Select the aircraft Strike #1.
- "Unit Orders/Attack Options/Engage Targets (Auto)".
- Select Target 1.

The rest is in the hands of the pilot, he will proceed directly to the target, adopt a suitable attack profile, and drop the bombs. He should get there in about 15 min of game time so you can speed up time with the "+" key, remembering to slow it down as he approaches the target using the "-" key or drop it to 1:1 time compression with the "ENTER" key. You can always hit the "SPACE BAR" to pause and restart the timer.

Strike 2 Message

If you were lucky, you killed Target 1 but there is a good chance you missed with your bombs, that's what Korean War era weaponry is like. When you bomb with LDGPs (Low Drag General Purpose) bombs, use lots of them.

One thing to consider when using "dumb bombs" is your attack altitude. Many Cold War era fighter-bombers were designed for the fast & low approach. Low because the geometry of a low release altitude keeps the bombs close to the target and reduces the miss distance, whereas a high-level release increases the likely area the bomb will drop exponentially, plus the added time in the air allows wind and many other ballistic factors to affect the bombs more dramatically. The fast part of this delivery method is needed because it is not healthy for a multi-million-dollar aircraft to be dragging its tail down where everything from tree branches to shrapnel from its own bombs and small arms fire can damage it, not to mention anti-aircraft guns and missiles.

Your next strike will be a bit different; you will step forward about 50 years and use some modern JDAM (Joint Direct Attack Munition) weapons. In reality this is simply a guidance kit strapped on to the old 1950's era weapons family you dropped in Strike 1. But it makes a difference.

First a little bit on weapon names: We will consider Warsaw Pact and other bombs in further tutorials but in this instance, the standard bomb in NATO is the American Mark-80 series:

- Mark 81 - nominal weight 250 pounds (113kg)

- Mark 82 - nominal weight 500 pounds (227kg)
- Mark 83 - nominal weight 1,000 pounds (454kg)
- Mark 84 - nominal weight 2,000 pounds (907kg)

The Mk 81 (Firecracker) was used in Vietnam but not much after that and is no longer produced.

The Mk 82 is the most popular of this series due to its small size allowing more to be carried by many different aircraft types and the low blast radius which keeps a limit on collateral damage, critical in many modern operations.

The Mk 83, although regularly used by the US Navy, is not popular with most other forces. It doesn't have the striking power of the Mk 84 but causes more unintentional damage than the Mk 82.

The Mk 84, when you need to hit something hard you use this bomb. Added to all of these bombs are guidance kits; laser, GPS, or both; and/or delivery systems that either slow the bomb down, allowing a lower altitude delivery (Snakeye) or a penetration capability (BLU-109).

For this mission you have one F-16 with two GBU31(V)3/B JDAM (BLU-109/B) with a Sniper XR Pod [FLIR] and an AN/ALQ-184 Pod as well. Let's break all that down:

- GBU: Guided Bomb Unit
- 31: for a Mk 84
- (V)3/B: guidance kit version
- JDAM: GPS Guided. For more detail go [here](#).
- BLU-109/B Penetrator fuse
- Sniper XR Pod[FLIR]: Targeting pod [Forward Looking Infrared] – detail [here](#)
- AN/ALQ-184 Pod: An Electronic Countermeasures Pod (ECM)

Now as far as targets, there are two Hardened Aircraft Shelters, the perfect target for a 2000lb penetrator. They were almost made for each other!

Launch your second-strike aircraft and move it towards the target.

Strike 2 Target Message

Now in this strike you're going to be a little more precise with the targeting.

- Select the aircraft Strike #2.
- Hit "SHIFT + F1".
- Drag-select both targets labelled Target 2.
- The Weapon Allocation dialog appears. It has four main areas:
 - The top of the left column lists your attacking units.
 - The bottom of the left column lists your targets.
 - The center column are the suitable weapons.
 - The right column is for confirmation and some other stuff we will get to later.
- Select the unit (Strike #2) in the upper left column.
- Select one of the targets in the lower left column.
- Select the GBU-31 in the center column, we will strafe with guns later.
- At the bottom of the center column are three bars, the top one allocate weapons to selected Target(s) is the one we want, put a 1 in the selector window.
- Press the button bar in the previous step.
- Both sections of the right-hand column should indicate that 1x GBU-31 is allocated to the target.
- Select the second target in the lower left column.
- You should have one bomb left, allocate it to this target.
- If something has gone wrong, you can de-allocate your weapons and go back to the start of the process.
- You can close this menu.

When using a manual attack, you will need to put the unit into a position to attack the target. Plot a course towards the target to within 13nm of the target, at an altitude above 2,000 feet and below 65,000 feet.

That's it. Now you can watch to see what happens as your pilot earns his paycheck for the day.

Strike 2 Target Update Message

By now you should note a couple of things:

- Strike #1 automatically returned to base (RTB) once his ammunition was expended. You can change this behavior through the doctrine interface but for now we will leave it alone.

- Strike #2 has two circles around it. A red circle representing its air-to-air weapons range and a brown one representing its air-to-surface weapons range. Strike #1 had these as well but you probably only noticed the red A2A circle. Since your current load of JDAMs has a 13nm range the circle is apparent and useful. We are not going to be bothered by enemy aircraft, let's turn the A2A circle off.

Go to the "Map Settings" menu and uncheck "Air Weapons". The red circle disappears. You will note that you can turn on or off any one of the range circles. These are for you to use as you need or wish, feel free to experiment with whatever helps you with your battle. The Sensor ranges won't appear unless you turn your radars on ("F9", unit menu or sensor button on the right). You don't have sonar on an F-16 so I wouldn't sweat that one.

Strike 3 Message

Modern weapons are so much easier to use. Now it is unlikely you killed both targets, but you should have at least hit both. Each of the JDAMs have a damage ability of 363 DP, and each of the HAS have 350 DP, so in theory one bomb per target right? Wrong! Well sort of.

To achieve the maximum effect depends on a large number of factors which are modeled in the game through a series of factors and dice roles. The message log will help give you clues: In one example:

7:40:05 AM - 7:40:05 AM - 37% penetration achieved.

7:40:05 AM - 7:40:05 AM - Weapon: GBU-31(V)3/B JDAM [BLU-109/B] #56 has impacted Target 2.

7:39:49 AM - 7:39:49 AM - Weapon: GBU-31(V)3/B JDAM [BLU-109/B] #55 missed Target 2 by 75ft

One of my JDAMs missed by a massive 75ft (about 10% of the miss distance in Strike #1), who knows why; a gust of wind, problem with the GPS, hit a bird! That HAS survived with light damage, good chance that the HAS did its job and protected any aircraft inside.

The other JDAM hit the target and penetrated (37%). That HAS, is on fire and has heavy damage. Chances are any aircraft inside would be destroyed or at least damaged.

Thankfully there were no malfunctions and both bombs worked. The lesson is that in precision strikes one bomb for one target is no guarantee of a kill.

Moving on to Strike #3

This strike is something a bit different, you're going to use cluster munitions or [CBU-105](#), WCMD specifically (Wind Corrected Munitions Dispenser). These are designed for top attack on tanks and other armored vehicles.

You may have read or heard that cluster munitions are outlawed by the Geneva Convention. That is not specifically true, you can read the detail [here](#). The focus of the ban is to eliminate munitions that leave the equivalent of anti-personal mines on the battlefield, such as many early generation munitions with high dud rates did. Many modern CBU's comply with paragraph 2.c and are specifically targeted, have self-destruct or deactivation mechanisms or are generally much more reliable than older munitions.

You have an anti-tank cluster munition, and you have two lonely tank troops as a target. Launch and get Strike 3 moving towards the target.

Strike 3 Target Message

Now that Strike #3 is airborne, let's adjust our doctrine a little bit.

- Go to the "Game Menu" drop down menu and select "Side Doctrine, EMCON, WRA".
- Right column under Air Operations, most of the way down, "A/G strafing (gun)", change to "Yes".
- Close the Doctrine window.
- Select Strike #3.
- Hit "F1" and drag-select the two tank troops marked Target 3.

You may have noticed that the tank units, you can tell that they're tank units by the tank track symbol if you're using NTDS symbols, have the number 3 next to their upper left side. This represents the number of actual tanks that the unit contains. When you fire a weapon at the unit, a 1 will appear in the lower left side to represent the number of weapons that unit has allocated to it.

When using NTDS symbols, infantry is represented by a large X depicting the crossed belts of a Napoleonic soldier and artillery is represented by a dot to represent a cannon ball.

Strike 3 Target Update Message

Your attack order gave the pilot two targets, and he followed his Weapons Release Authority (WRA) and released both CBUs on one tank troop, which has a "Missile Defense" estimate of 4 (see database). Once you watch the cool CBU graphics destroy one of the tank units, you are left with one tank unit alive and well. Time to strafe him.

- Select the aircraft Strike #3.
- Hit "CTRL + F9" and set the Weapon State RTB doctrine, in the right column, "No, aircraft do not RTB when weapon state is reached".
- Hit the "U" key. He was in an RTB state, so you have just unassigned him from that order.
- Hit "SHIFT + F1" and select the remaining tank unit.
- Strike #3 should already be selected, as is the only target. Click on the 20mm/85 Vulcan Burst in the suitable weapons column.
- Click on the bottom bar "Allocate all weapons of this type".
- Double check that all 5 available bursts (500 rounds of Vulcan cannon) are allocated and close the box.
- Manually order the aircraft to descend to 2,000 feet or lower and plot a course over the target.

You can also order the aircraft to conduct an automatic attack.

Strike 4 Message

Strike 4 will be using a very modern version of a bomb. The SDB, Small Diameter Bomb, first fielded in 2006 is truly a weapon designed for the "current fight" or Counter Insurgency Operations (COIN). It is smaller than the defunct Mk81 at only 200lbs, but it has a range of 60nm and is very accurate.

You have 8x GBU-39/B SDBs and 6 small buildings to destroy. Use your munitions frugally to destroy all buildings.

Strike 5 Message

Mobile targets are the next task. Older JDAMs, many guided weapons and certainly dumb bombs have a hard time striking these targets. Fortunately, the F-16 has the ability to use AGM-65 (Air Ground Munition), the Maverick missile. This is based on a 1970's design but has gone through significant improvement, details [here](#), it is good for much more than moving targets but it is one of the few pre 2000 weapons that can reliably hit movers.

You have two moving cars to strike and 2 missiles to do it with. Engage.

Now might be a good time to check how you're doing. Don't worry, this is a basic tutorial, and you will win, but it is always nice to know how the fight is going. In COMMAND, scenario designers have complete latitude in how they score a scenario, which is fantastic, but it does take a while for a player to get used to. In some of my scenarios the player is likely to get his/her butt kicked, so I adjust the scores so you can measure how well you are losing, if that makes any sense at all.

In this scenario you get 10 Victory Points (VP) for every target you destroy, and you achieve a Triumph by destroying 15 of them. Sometimes you get points for achieving missions, preventing the opposing force from doing something or preserving your assets. Totally up to the designer. Some players don't really pay attention to point scores, neither do some designers, in this case if it feels good you've won.

To check how you're doing as measured against the designer's idea of how the scenario should unfold, go to "Game Menu" and then select "Scoring":

- The first tab is the "Evaluation" which goes from Disaster to Triumph, here you are Average because the point score is 0.
- The next tab is the "Losses and Expenditures" readout which shows what you have expended in munitions and what you have killed. And the same for each side in the game, and there could be many sides depending on how complex the scenario is. Be advised that there is a bit of a spoiler or cheat on this tab, it will show *exactly* what you have killed, even though you may not have received accurate BDA (Bomb Damage Assessment) on your strikes. If you don't want to bend the rules of physics, don't look at this page until the end of the game. If you want to learn the effects of munitions or what the heck has been giving you all those problems, take a look, it's your game. You can also get to this screen directly from the Game menu.

- Finally, the "Scoring Log" will give you an event-by-event countdown of how you gained and lost points.

Strike 6 Message

Ever used the saying "I feel like a million bucks!?" Well at \$1.5 million each the JASSM (Joint Air-to-Surface Standoff Missile), is a truly capable munition, just don't expect too many of them. The AGM-158 has a range of 215nm so is certainly a standoff weapon, it has a sub-sonic terrain following cruise and a double warhead; one to penetrate and one to destroy.

For this one fly towards the target, out past Target 2, and you will get another message outlining what you should do for the attack.

Strike 6 Target Message

OK now follow this procedure:

- Select the aircraft Strike #6.
- Hit "SHIFT + F1", drag select the two targets to bring up the Weapons Allocation dialogue.
- Assign one JASSM to each target.
- Now in the lower right box, select the JASSM that is assigned to one of the targets.
- The "Plot Course" option becomes available, press this button.
- You're now on the map screen and each cursor click becomes a waypoint, maximum 10 and you cannot exceed the range of the weapon.
- Plot a course and do the same for the second weapon. If you don't like your course, click on clear course and do it again.
- Once you're happy close the box and watch them fly. This is a great way of getting around defenses.

Strike 7 Message

This is not really a strike but once you launch your aircraft (Strike #7) fly it toward the target and when you get a few miles out of the base, hit "CTRL + F1" this is a Bearing only Launch and you should launch your MALD (Miniature Air-Launched Decoy),

anywhere you would like. This is another useful technique you will need to penetrate heavily defended areas.

After this you have several aircraft about to be ready so you should feel free to play around with the different weapons on board to destroy any targets on the range.

You're now qualified to *Bomb stuff!*

Summary Message

In this tutorial you have used a wide array of munitions to attack various targets. Standard dumb bombs tend to miss a lot but if you drop enough of them, you will do some damage. More modern weapons, while not as versatile as a standard bomb, do a much better job at hitting the targets. Remember that you should use the best tool for the job at hand, munition selection is one of the most important decisions you have when planning a strike.

There are no *wonder weapons* that are all things to all targets; JDAMs are great if you know where the target is and it's not moving; Mavericks are great against moving targets but don't do a lot of damage; SDBs are great for small pinpoint targets but cannot penetrate and don't hit very hard; Cluster bombs cover a wide area and penetrate armor but don't do too much to buildings. The nearest thing that you have to a *Silver Bullet* is a JASSM, but you probably won't have many of them and only in very modern scenarios.

See you in Tutorial 2 where we will cover the mission planner and basic concepts of attacking.