



Wildfire Pilot

Firebombing Procedures Manual

2017



Introduction

The purpose of this manual is to provide a set of procedures that will allow for simulated firebombing missions to be conducted as close to real world procedures as possible. Just remember it's about having fun, if you miss a few points during a mission it's nothing to worry about.

*The primary objective should always be to have a good time,
don't let the details bog you down...*

Required Information on Dispatch

There is a minimum of 4 pieces of information required for a group to be dispatched to a fire. This information should be included as part of the readme file included with all scenario's.

- 1) Latitude & Longitude coordinates (The payware, Reality XP GPS unit gives you the option to fly to specific coordinates)
- 2) Geographic location
- 3) Magnetic Bearing in degrees from the point of dispatch
- 4) Distance in nautical miles from the point of dispatch.

Altimeter Setting

The airtanker group will maintain the altimeter setting from their initial point of dispatch for the duration of the mission. This may change if the birddog pilot assumes a more current or local setting. The birddog team must confirm to all aircraft the altimeter setting in use. When dispatched to assist another airtanker group, all incoming aircraft will use the altimeter setting set by the working birddog. FSX and FS9 loads all flights with a standard altimeter setting of 29.92. You can use this setting or change it as long as all pilots involved with the flight are aware of the setting being used.



Enroute

Sequence of events/Requirements

Once airborne and established enroute, all aircraft will proceed to the fire in the most direct and expeditious manner. It is preferred that the airtankers give the birddog aircraft a slight head start to allow them time to organise themselves over the fire.

It should be noted that, weather permitting, the minimum recommended altitude for crossing ridges in mountainous terrain is 500 feet AGL. Every effort shall be made to adhere to this standard.

The AAO will determine the closest reload base.

Good airmanship procedures suggest that aircraft should fly a parallel route slightly to the right of the 'GPS Direct' track to increase lateral traffic separation.

Birddog aircraft and airtankers are considered to be on patrol for other fires while enroute the target. Airtanker pilots will report new fire information to the birddog team and may be required to plot the coordinates.

Birddog '5 Minutes Back'

At or prior to this point the birddog team will establish air traffic control. Contact will be made with any known aircraft in the area and location & intentions confirmed. The AAO will also contact the ground crew on site to commence a mutual fire strategy, establish objectives and start removing any resources within the drop area.

High-Level Decision-Making

The birddog crew and airtanker pilots must be cognizant of the following factors which may limit the degree to which a fire is worked:

Prevailing winds limit the ability of aircraft to maneuver and the accuracy of retardant drops, especially in mountainous terrain.

Turbulence, may be mechanical, convective or clear-air.

Downdrafts are caused by lee-side airflow, thunderstorms, differential heating or the convective effects of intense wildland fires.

Obstructions to visibility may include smoke, cloud, precipitation, lessening daylight, shadowing and sun glare.

Precipitation reduces visibility and there is potential for hail associated with thunderstorm activity.

Lightning is an indication of unstable air and an impending convective storm. Terrain may limit run directions and the viability of exits. Always take advantage of the big picture from an elevated perspective.

Avoid focusing on the terrain immediately around the fire.

Powerlines, cables, tall trees, snags, towers and the proximity to built-up areas all restrict low-level work.

In consideration of the hazards and exercising risk management, alternatives to reaching the objective may be formulated. There should be absolutely no pressure on crews to be rushed into action prior to properly assessing the overall fire situation.

Low-Level Decision-Making

Prior to descent to low-level operation, the birddog team will have determined the aerial suppression objectives and formulated an attack plan: “We have a spot fire burning uphill on a steep slope. We will be blanketing the fire with 4-door salvos, stepping down the hill from left to right.”



The birddog team will determine the orientation based on prominent natural or artificial features: “the river runs north/south”.

The birddog team will identify hazards, exit routes and flight paths. If hazards to safe flight pose an unacceptable risk, the AAO will terminate airtanker action and advise the ground crew.

If the hazards and risk are acceptable to the birddog team, they will determine the circuit direction. In determining run directions in other than flat terrain, the team will ensure that all exits are flown at or below target elevation while turning away from any hazards.

Checking the Runs

Prior to the identifying the target to the airtanker pilot and in full consideration of the risk management/decision-making aspects of the job, the birddog team will physically assess the initial bombing runs for.

Feasibility of Approaches

The ideal approach is a left-hand circuit descending onto the final leg. This allows the pilots to keep the target in sight at all times. Terrain and visibility restrictions may limit the circuit to a right-hand direction only. The birddog team will identify ridge crossing altitudes and relay them to the following airtankers to aid their flight descent profile.

The birddog team will ensure that steep turns in narrow valleys do not exceed angle of bank limitations as specified in company operations manuals. **Any angle of bank in excess of 30 degrees must be identified to the airtanker pilot.**

Up-valley flight toward the head of the valley must always allow room for a 180-degree reversing turn. The birddog team will take note of any prominent features that may be included in the run description to assist in describing the line and release point to the airtanker pilot.

Feasibility of Exits

Bombing runs into rising terrain are prohibited. All runs must include an exit at or below target elevation in the event a combination of a reduction in power and an inability to release the retardant load occurs.

Target Elevation

The actual altitude as read from the altimeter as the birddog passes overhead the target at the correct bombing height above ground. Calling the elevation allows the airtanker to fly an appropriate flight profile to the target when in the bombing circuit.

On steep fires where the elevations differ, the birddog must check the safety and feasibility of each run and its exit and call the applicable target elevation to the following airtanker.

Hazards

Hazards not assessed during the high-level orbit will be identified when flying the actual bombing run. These include visibility & turbulence concerns and obstructions indiscernible from altitude.

Airtankers '5 Minutes Back'

Airtankers will establish contact with the birddog aircraft when they are 5 minutes from the incident. At this time the birddog team will give the airtanker pilot the following information:



Mandatory Points:

- 1/ Altimeter setting
- 2/ Position in the stack
- 3/ Entry altitude into the stack.

Time Permitting:

- 4/ Target Elevation
- 5/ Identity and type of the preceding airtanker
- 6/ Brief fire summary and objective
- 7/ Orientation and direction of run
- 8/ Any applicable flight safety hazards or traffic conflict.

Stacking Procedures and Aircraft Separation

All inbound airtankers must contact the operational birddog aircraft 5 minutes back from the fire. At this time the birddog will assign the altimeter, entry altitude into the stack (at 500 foot intervals), and the airtanker's number in the stack. Once the incoming airtanker has entered the stack, the airtanker pilot must inform and receive acknowledgement from the birddog team.

Note – It is extremely important that pilots maintain situational awareness while vertically separated from other aircraft in the stack. Instruments alone should not be relied upon to maintain the 500 feet of vertical separation required. Each pilot in the stack must attempt to keep the airtanker 500 feet below them in sight in order to visually confirm aircraft separation. Given

the possibility of momentary pilot inattention, it is imperative that each pilot maintains this discipline and promptly communicates any loss of visual reference with the airtanker below them. In real world operations the airtanker pilot in a circuit would fly the aircraft “by hand” you may find it easier to use the autopilot “ALT hold” function to maintain your altitude in the circuit.

When established at the assigned altitude and position in the stack, and considering the need to maintain visual reference/separation with other airtankers, the airtanker pilot will:

- 1) announce arrival and altitude (“Tanker 489 is overhead at ____ feet”)
- 2) assume a left-hand orbit
- 3) observe the action and listen to the instructions given by the working AAO/birddog team.

After the birddog team has issued instructions to the working airtanker (#1) to exit the airspace, airtanker #2 will automatically descend to the base-of-stack altitude and assume the working position. Airtanker #2 will simultaneously broadcast the maneuver with a statement that includes that airtanker’s tail number and a confirmation of the altitude to which it’s descending. The birddog team will acknowledge this statement. Upon hearing this acknowledgement, all other airtankers in the stack will simultaneously descend 500 feet to their new lower stack position while maintaining visual reference to and separation from the aircraft below them.

It remains incumbent upon the birddog team to allow time on the frequency for this information exchange to occur. Conversations with the outgoing airtanker shall be kept brief and pertinent in order to allow airtanker #2 to make the required broadcast.

Aircraft Separation – Birddog & Working Airtanker

The working airtanker shall not occupy the birddog airspace (up to 1000 feet above target elevation) until positively cleared into that airspace. A phrase including the working airtanker’s tail number and the words “cleared for the run” will signify that the birddog team is permitting that airtanker to share the common airspace. Once the “cleared for the run” command has been issued, the airtanker may begin an immediate descent for the bomb run.

Standard procedure requires the birddog to maintain right-hand orbits or circuits with breaks to the right after dummy or observation runs whenever possible. The airtankers observe in a left-hand orbit, and generally prefer a left-hand circuit (terrain permitting) when cleared for the run. The airtankers will exit as briefed by the birddog team.

The two aircraft occupying the airspace within 1000’ above the ground must maintain visual separation. In the event visual contact is lost, each aircraft must fly standard predetermined

flight paths until visual contact is regained. Maintaining visual separation in flight simulator may be difficult, we will leave it up to your discretion on how you want to deal with this. A head tracking system such as TrackIr will allow for much greater situational awareness but is certainly not required.

Should terrain or aircrew preference require use of a non-standard pattern, the procedure to provide lateral separation must be briefed and updated as necessary.

The need to keep the bombing frequency free of superfluous traffic and the use of clear and concise transmissions is essential when we have two aircraft operating in the same airspace. The silence on this frequency is not wasted, but serves as a valuable buffer available to all aircraft to avoid confusion and reduce the possibility of a conflict.

Verbal Identification

As noted earlier, upon arrival at the incident, the airtanker pilot will advise the birddog team when coming up overhead. At this time the “birddog team” will provide the airtanker pilot with a more detailed description of the proposed run and target. Information provided may include:

- Target elevation
- Direction of run
- Direction of approach (left or right-hand)
- Placement of drop
- Correction for wind drift
- Type of drop
- Hazards
- Exit

Target Identification Techniques

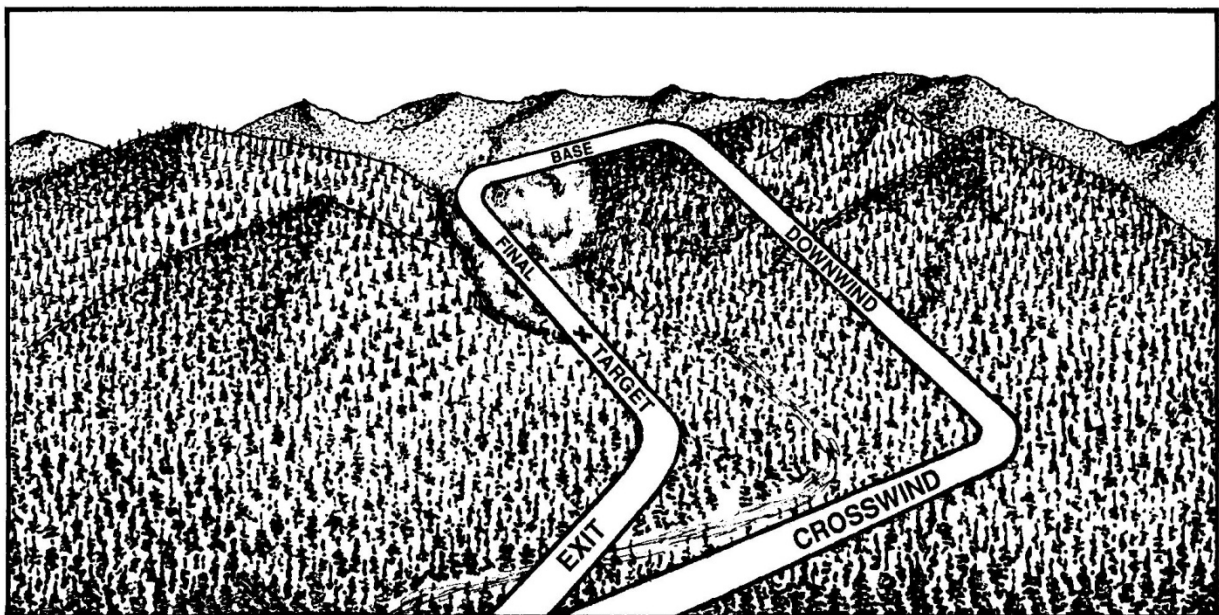
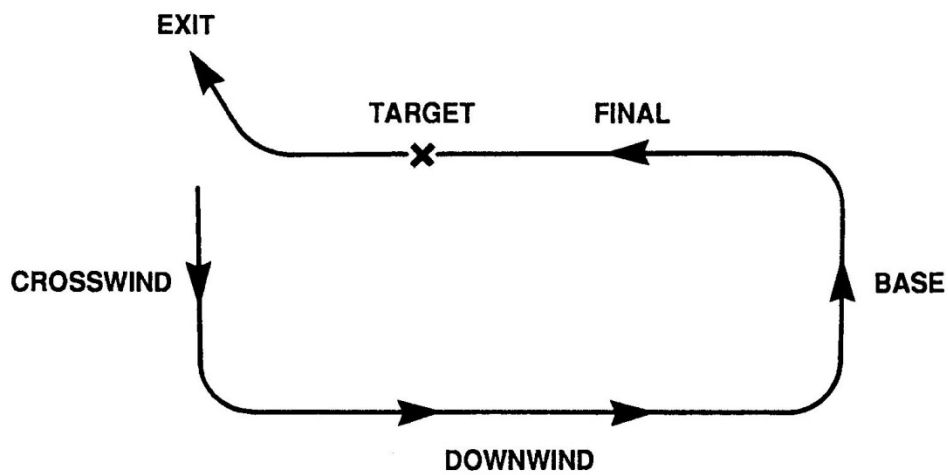
Following confirmation that the airtanker is in position to observe the run, the birddog team will use one of the following techniques to pinpoint the target:

- | | |
|-----------------|---|
| The Dummy Run | This is the preferred method for use with land-based airtankers in firebombing operations. Other methods are employed as conditions dictate. |
| The Lead-In | This method is used when the run, or line and trigger point are difficult to see or describe due to visibility or lack of references. It is also the primary identification method used in waterscooper operations. |
| The Called Shot | This method is used when the airtanker pilot understands the run but cannot discern the trigger point. |

Regardless of the method used, it is essential that the airtanker pilot clearly understands where the load is to be placed. Time spent clarifying a point will pay off if it avoids misplaced drops, incorrect drop types and go-arounds & their associated exposure to risk.

The Circuit

All bombing runs will be flown as a standard left hand circuit unless terrain, smoke etc, require a different approach.



The Dummy Run

The dummy run is a simulated bombing run made by the birddog to demonstrate the run and identify the target to the airtanker pilot.

The birddog team will confirm that the airtanker is in position to observe and the Birddog team will commence the run description by announcing the birddog's position in the circuit. It is preferable for most airtanker pilots to approach the target using a left-hand circuit.

Depending on the birddog's location when the airtanker gives the cue to start the run, the birddog may fly the dummy run circuit right-hand for expediency's sake. The announcement "right-hand for convenience" infers that the birddog team expects the airtanker to use the preferred left-hand circuit which has been previously flown and checked. It is recognized that terrain and other limitations may limit the operations to right-hand circuits only.

The "birddog team" will proceed to describe the circuit announcing the turns onto new legs, giving clear references if available. Ridge crossing elevations will be passed to the airtanker as required through the circuit.

The "birddog team" will identify reference point(s) to assist the airtanker pilot in determining the proper line and will describe any hazards on final approach.

The "birddog team" will announce visual contact with the target and when the birddog is overhead will identify the *target* by announcing "Bombs Away Now".

The "birddog team" will describe the exit and any hazards on exit.

Upon completion of the dummy run the "birddog team" may describe any hazards to flight performance that have been encountered. To maximize efficiency, the "birddog team" may announce the intentions for any subsequent run.

Transmissions will be short during the run description.



The dummy run is normally used for the first airtanker on a specific run or when an incoming airtanker has not had the opportunity to observe the previous drop. Subsequent run descriptions may be given verbally rather than demonstrated but the birddog team must have previously flown and checked them for feasibility.

Once the target has been identified, the birddog pilot will place the aircraft in such a position to allow an unobstructed view of the run and the drop to permit corrections and assessments as required.

When the airtanker pilot announces turning final, radio silence will be maintained unless the line being flown requires correction or an obvious safety concern exists.

When on the final leg, the airtanker pilot will reconfirm that the drop system is armed and will repeat the drop type selected.

The “birddog team” will acknowledge this transmission and correct the drop type if required.

Dummy Run Example

The following example is meant to help put the above-noted procedures in better perspective.

Airtanker	“Birddog 151, Tanker 445 is overhead and have you visual.”
Birddog team	“Tanker 445, Roger. Our objective is to box-in the fire with retardant. The valley runs North/South, your run will be from North to South on the downhill side of the fire. Target elevation is 1800 feet. Arm for one-half at coverage level six.”
Airtanker	“Tanker 445 checks, One-half at Six.”
Birddog team	“Tanker 445, Roger. Check us over the fire and turning crosswind for the run.”
Birddog team	“We are downwind left-hand.”
Birddog team	“Turning base and crossing a small ridge at Twenty-Three Hundred feet.”

Birddog team	“Turning final over the round swamp, lining up with the left side of the fire and a tall grey snag... Tag on to the snag...Short final at 1800 feet...Bombs Away now.”
Birddog team	“Exit slight left and follow the valley... Caution rising ground off your right wing
Birddog team	“445, note we ran into some descending air turning base to final. And caution: that tall snag you are to tag on to really pokes out above the main canopy... easy left turn on the exit and follow the valley out.”
Airtanker	“Tanker 445 has the run, turning crosswind”.
Birddog team	“Birddog 151 checks – 445 is cleared for the run. Anticipate the next drop will be the same run in the same direction tagging onto the drop you’re about to make”.
Airtanker	“445 turning final armed one-half at coverage level six.”
Birddog team	“Roger.”
Birddog team	“Tanker 445, Bullseye. Next drop: tag on to the head of the last drop and extend, turn the line 20 degrees left. Arm the remaining half at coverage level six. The exit is left down the valley and caution the tall snag you just tagged on to.”
Airtanker	“Tanker 445, Roger. Downwind”.
Airtanker	“Tanker 445 turning final armed one-half at coverage level six”.
Birddog team	“Roger.”
Birddog team	“Tanker 445, one-quarter short...Puntzi and stay.”
Airtanker	“445 Puntzi and stay.

Drop Types and Coverage levels

There are two primary types of tank systems in use today on firebombing aircraft, the variable flow tank and the compartmentalised tank. The variable flow tank has two doors that are controlled via a computer system. The doors can be programmed to allow a specific portion of the load to be released at a specific rate ie ½ the load at coverage level 6.

A coverage level is the total gallons of retardant dropped onto a 100 square foot section of ground. The standard coverage levels used are: 0.5, 1.0, 2.0, 4.0, 6.0 and 8.0. You may also hear the term “at max” which indicates the birddog team wants the drop to be at the maximum flow rate of the tank. Drop types are described as the portion of the load to be dropped and the coverage level required i.e. $\frac{1}{4}$ at coverage level 4.

Compartmentalized tanks have a minimum of two doors and a maximum of twelve (Firecats have a four door compartmentalized tank) that can be opened together (salvo) or independently of each other. To achieve a string drop the doors would be opened independently with a short time interval between them. Drop types might include: a single door, a two door salvo (two doors at once) a four door salvo, a single door string for a total of 4 at .5 (one door at a time with an interval of 0.5 seconds between doors for a total of 4 doors)

In MSFS the drop effects do not allow for a great deal of variance, you can't set coverage levels or select portions of the load to be released. It's up to the tanker pilot to listen to the drop type given and then attempt to give a drop that is close in length to what you might expect from the aircraft you are flying. For example, you are flying a small tanker and the birddog team has asked for a drop that is $\frac{1}{2}$ at max, the drop should be relatively short, 1-2 seconds in length, the same drop from a heavy tanker might be 3-4 seconds in length.

