

# AFCAD files and AI Flight Plans for southern and central British Columbia, Canada

by **Holger Sandmann**

These flight plans add a reasonable number of general aviation (GA) flights, plus a few commercial ones, to airports and airfields in southern and central British Columbia that were previously devoid of AI traffic, or almost so. The plans are designed (and tested!) to work with the set of airport facility (AFCAD) files contained in this package as well as my terrain mesh files of B.C. and southeast Alaska. Feel free to use different aircraft or to modify the airports but be forewarned that the mountainous terrain and often short runways pose specific challenges to AI aircraft (see Known Issues below). I have spent many hours tweaking flight plans, aircraft configurations, and AFCAD files to achieve a satisfactory performance (explained in the Technical Details section). If you find dealing with the add-on aircraft too daunting or not worth the effort simply substitute with any default aircraft and repaints you find suitable. However, you only need to go once through setting up the add-on aircraft for AI; after that, you can use them in any other flight plan including the FS2002 default ones!

Essentially, you have four different options, or stages, of setting up the aircraft and flight plans, with increasing complexity with regards to the hoops you have to jump through (If you find it difficult to decide: there are a number of screen shots, airport lists, a map and an example timetable in the **images\_and\_documents** folder). For each option, the minimum required is to install the AFCAD files; once you have done so you can:

- (1) use GA Traffic Maker to make your own set of flight plans. If you're already familiar with Mike Holland's utility, this is probably the quickest way to get results. However, keep in mind that parking space is limited at many of the small airfields (see my "airport\_list\_by\_..." files) and that GA Traffic Maker provides only limited control about flight plan destinations, which can lead to significant problems (see Known Issues below) with regards to aircraft behavior and "survival".
- (2) install my GA flight plans but use only FS2002 default aircraft (use **FS2002only\_Aircraft.txt** and **FS2002only\_FlightPlans.txt** instead of the BC\_Aircraft.txt and BC\_FlightPlans.txt files). This will provide you with my custom flight plans while still allowing for a fast set-up but you'll miss out on the fancy add-ons. However, if you start with this option, you can always come back to the instructions and set up the add-ons at a later time.
- (3) install my GA flight plans and one or more of the add-on aircraft. Setting up all the aircraft might take some time but I have tried to make it as easy as possible for you and the rewards are very nice. And remember you only have to do this once!
- (4) install as in (3) plus add the commercial planes and flight plans. It requires a few more downloads but will provide the "icing on the cake" and complete your setup just as I have it on my own system.

**Note:** Most of the changes I have done to the aircraft.cfg files stem from trial and error as well as tips and tricks I found in several of the extremely helpful discussion forums on the Internet. I don't claim that these changes make (physical) sense and know that there are alternative tweaks that provide similar results (after all, we're talking about differential equations with dozens of variables). What I do claim is that these changes work for these aircraft (at least on my system) and result in consistent and reasonable behavior during their use as FS2002 AI traffic.

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## Installation:

1. **TrafficTools** (by Lee Swordy), and a generic text editor are required. If you want to make changes to my AFCAD files or install them individually, you'll need AFCAD (also by Lee Swordy). You can find the latest version of Lee's utilities at the main FS2002 related webservers, such as avsim.com, flightsim.com, and simviation.com.
2. If you haven't already done so, unzip **bc\_afcad.zip** into a temporary folder.
3. In the **BC Interior AFCAD and flightplans** folder, open the **BC\_airports** subfolder and drag and drop the **bc\_afcad.LST** file over the **AFInstaller.exe** icon; a window will open displaying the progress of installation (on completion, the window will close automatically). Alternatively, if you want to view each airfield before installing it, use the Import function of AFCAD.
4. For the following steps you'll need a decompiled set of files---**Aircraft.txt**, **Airports.txt**, and **FlightPlans.txt**--from your current AI traffic file, traffic.bgl (it resides in your FS2002\SCENEDB\ATC\Scenery folder but you can only edit it through the Traffic Tools decompiler). Go to the folder in which you have **Traffic Tools** installed and run **Decompiler.exe**; the three files should appear in the Traffic Tools folder once the decompiler stops running. I suggest that you make a backup copy of these three files in case you run into problems with the following procedures.
5. Open your **Airports.txt** file and my **BC\_Airports.txt** file and copy & paste any missing airports into your Airports.txt file, in alphabetical order. Also check for differences in the airport coordinates and use mine if in doubt. Save your Airports.txt file and close both files.
6. Open my **BC\_Aircraft.txt** file and consider which of the default and add-on aircraft you'd like to use. If you want to include some of the add-on aircraft, go to the **GA\_add-on** folder and follow the **readme\_GA\_add-on** instructions. If you want to include any of the commercial aircraft and (fictitious) flightplans as well, go to the **COM\_add-on** folder and follow the **readme\_COM\_add-on** instructions. Once you're done with that, come back to this document and continue with Step 7 below.
7. If you're using the Standard version of FS2002, you'll have to decide on substitutes for the four GA aircraft specific to FS2002 Professional: Beech Baron 58, Mooney Bravo, Beech King Air 350, and Cessna Grand Caravan. Alternatively, search the usual web sites (AVSIM, FlightSim, FSPlanet, Google, etc.) for the following files, which will provide you with the missing aircraft: **b58dbf.zip/baron\_888mr.zip** (in combination), **cx\_mbal.zip**, **beech\_king\_air\_350.zip**, and **blk208b.zip**. I leave it up to you to find appropriate repaints; there are many available on the web servers.
8. Open your **Aircraft.txt** file and my **BC\_Aircraft.txt** file. In these files, each aircraft occupies one line of text. Copy & paste all of the add-on aircraft and repaints that **do not** occur in your Aircraft.txt file into it, in numerical order (but it's okay to have gaps in the sequence of AC#). Then, for each aircraft and repaint, default or add-on, check whether, in your Aircraft.txt file, it has **exactly the same AC#, cruise speed** (the second column), and **aircraft title**. If there are any mismatches in cruise speed and aircraft title, make the required changes to **your** Aircraft.txt file. In case of mismatches with the AC#, open my **BC\_flightplans.txt** file and change the AC# of the corresponding aircraft to match its AC# in your Aircraft.txt file. **Make sure that you don't end up with two different aircraft having the same AC# or aircraft title.**

9. Open your **FlightPlans.txt** file and my **GA\_FlightPlans.txt** file. Before you continue here, read the section about the fictional Blizzard Run scenery in the **readme\_BC AFCAD** file and make the changes, if desired.
10. Copy & paste the contents of my **GA\_FlightPlans.txt** file into your **FlightPlans.txt**, it doesn't matter where. If you want to use my commercial flightplans and have the required aircraft installed, open **COM\_FlightPlans.txt** and copy & paste its contents into your **Flightplan.txt**. Save your **FlightPlan.txt** file and close all files.
11. In your **Traffic Tools** folder, double-click on **TCompiler.exe** to compile your three edited AI traffic files. Close the DOS window when the program is finished. If you get any error messages during the compilation procedure, please check what you might have done wrong and also consult with the manual for Traffic Tools, as it is well written and very helpful.
12. You're ready to enjoy the new AI company these flightplans create! For ease of testing, I have included a set of flights that will place you at a few of the airports at a time when one or more of the add-on aircraft are about to taxi and take off. To use these flights, simply move the **BC\_flights** folder into your **FS2002/flights** folder and select a flight in the FS2002 startup screen.

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#### **Known Issues:**

As many of you probably know, steep terrain and AI traffic don't work well together in Flight Simulator. Aircraft frequently dive into mountains, which they generally survive (providing some funky visuals when tracking aircraft with the aiview.dll module) only to crash on exit, particularly if they are in landing mode. If they don't battle with mountains, aircraft still might miss airports repeatedly, particularly those with short runways, and will disappear after three unsuccessful attempts. On other occasions, too high an initial approach often ends in a locked heading and altitude, with the AI aircraft continuing in a straight line, never to return.

Once you've installed my set of files as suggested and start flying in between the AI aircraft, expect some of them to exhibit the following problems or unrealistic behavior:

1. Aircraft disappearing into mountains or emerging from them---or not...
2. Repeated overflight of airfields and disappearing aircraft (after three unsuccessful attempts).
3. The odd "aimless" aircraft flying a straight line at low altitude.
4. Some airfields surrounded by steep mountains, such as Castlegar or Lytton, have particular problems in getting aircraft safely on the ground.
5. The four previous problems collectively lead to a slowly diminishing number of AI aircraft in each loop. Since FS2002 does not respawn crashed aircraft (actually, I have seen that happen occasionally but it is unpredictable), you'll have to reload a flight every few hours (e.g., by setting the time one minute ahead) to regain the full complement of AI company.
6. Smaller airfields are prone to having aircraft taxi in opposite directions and thus either pass through one another or get stuck in front of each other. My AFCAD designs try to minimize the potential for this but some places just can't be made AI-proof within the limits of the airport visual scenery.
7. For your own approaches to or take-off from some of the airfields, you'll notice that the tower will assign the same runway no matter which direction the wind is blowing. I closed off runway directions at these airports to force AI aircraft into a pattern with a higher likelihood of "survival".

If you don't like this, load up the airport in AFCAD and remove the "close for..." checkmarks associated with the given runway.

Despite these problems, I am amazed at how well the AI aircraft manage to hop across and in between the mountains and make successful flight maneuvers at small airfields. It's great fun to watch them zip around! Compliments to the aircraft programmers!

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### **Technical Details:**

Given the issues mentioned above it's no wonder that the FS programmers left most airports in mountainous areas "undeveloped" and unserved by AI aircraft. I decided to take on the challenge and design some flight plans with an acceptable survival rate for my home region---the mountain ranges and high plateaus of southern and central British Columbia. This section tells you what I've learned during many hours of following AI aircraft with the indispensable aiview.dll module (**aiview.zip**, available at <http://www.altingsoftware.com/>) and it briefly describes the "loop design" of my flight plans.

Generally, there are four options to influence the behavior of AI aircraft and their flight plans: aircraft type, flight mode (IFR vs. VFR), flight level (cruise altitude), and airport location/runway designation.

1. Since different aircraft models behave quite differently when in AI mode, the choice of aircraft makes a big difference. Generally, the default FS aircraft (in any available repaint) behave well and look good too. Add-on aircraft are a mixed bag and often require testing and tweaking to make them function well consistently (the crucial test is watching them land!). Of the eight freeware add-on small aircraft I use with my B.C. flight plans, only the Piper Malibu Meridian and the Found BushHawk-XP fly perfectly as is. For the other six, I had to replace the .air files with more stable ones and/or change data fields in the aircraft.cfg files.
2. Each flightplan (though unfortunately not each leg!) provides the choice of IFR or VFR mode. Most default and add-on general aviation plans use VFR mode but almost all of my plans are set to IFR for the following reasons:
  - (a) In VFR mode, the aircraft will fly in a straight line towards the designated airport and begin with the approach legs just a few miles out. The advantage is that VFR mode appears to have a better terrain-avoidance system than IFR mode that often—but not always—prevents the aircraft from flying through mountains. However, in steep terrain this feature interferes with the (controlled) descent and the aircraft almost always ends up way too high on first approach and on subsequent trials either never descends far enough or ends up flying through adjacent mountains anyway.
  - (b) After an unsuccessful attempt at landing in VFR mode, the aircraft will pull up its landing gear, if applicable, and climb a few hundred feet but then immediately drop the gear to begin the next traffic pattern. Aircraft in landing mode are more vulnerable to terrain obstructions (I guess the contact points in the aircraft.cfg file become "active") and usually crash when maneuvering in the narrow valleys. In IFR mode, the legs of the re-approach are longer and the gear only drops down on short final, giving a much better chance of survival.
3. For the small aircraft, I set the cruise altitude (flight level) for each leg of my flight plans about 2,000 ft above the highest mountaintop along the route. I didn't want to set higher levels because

it's unrealistic (for unpressurized cabins), leads to frequent overflight at first approach, and doesn't seem to help much with avoiding mountain fly-through.

- Obviously, location and configuration of the airports in each flight plan influence the flight pattern of the AI aircraft. With the help of maps and extensive testing, I designed the legs of each plan to maximize the likelihood of a smooth and uninterrupted (by mountains) flight. In this final version, I ended up with six independent loops of seven airports each, which I populated with 14 different small aircraft. Each airport has two aircraft staying overnight; there are no night flights (though some flights will occur in darkness during mid-winter). Each morning sometime between 9 and 10AM local time the "dance" begins: following a staggered schedule, all aircraft fly in the same direction to and from the seven airports within each loop.

The airports in the six loops are:

<b>Loop 1</b>	Vernon	CYVK	<b>Loop 4</b>	Prince George	CYXS
	Revelstoke	CYRV		Likely	CAX5
	Salmon Arm	CZAM		Valemount	CAH4
	Kamloops	CYKA		Blue River	CYCP
	Penticton	CYYF		Jasper	CYJA
	Kelowna	CYLW		McBride	CAV4
	Merritt	CAD5		Barkerville	CAS3
	Vernon	CYVK		Prince George	CYXS
<b>Loop 2</b>	Pemberton	CYPS	<b>Loop 5</b>	Tipella	CBB7
	Cache Creek	CAZ5		Squamish	CYSE
	Lytton	CYLY		Comox AFB	CYQQ
	108 Mile Ranch	CZML		Tofino	CYAZ
	Williams Lake	CYWL		Port Hardy	CYZT
	Lillooet	CAR3		Blizzard Run	BLR5
	Chilko Lake	CAG3		Bella Coola	CYBD
	Pemberton	CYPS		Tipella	CBB7
<b>Loop 3</b>	Castlegar	CYCG	<b>Loop 6</b>	Langley	CYNJ
	Creston	CAJ3		Hope	CYHE
	Trail	CAD4		Princeton	CYDC
	Nakusp	CAQ5		Delta Heritage	CAK3
	Cranbrook	CYXC		Chilliwack	CYCW
	Nelson	CZNL		Friday Harbor, WA	KFHR
	Grand Forks	CZGF		Qualicum Beach	CAT4
	Castlegar	CYCG		Langley	CYNJ

In addition, I used a subset of the 42 airports listed above to set up two flight plans each for six mid-sized aircraft that require longer runways, specifically the Learjet 45, Beech King Air 350, Beech Baron 58, Cessna Grand Caravan, Cessna C208 Caravan Amphibian, and Piper Malibu Meridian (I included them in the GA flight plans even though most of these aircraft types are typically used for commercial flights). Two additional airport used in this group of plans are Fairmont Hot Springs (CYCZ) and Pitt Meadows (CYPK), the latter utilizing the default FS2002 AFCAD file.

Finally, I added a bit of commercial traffic---again fictional---to Kelowna, Kamloops, Fairmont Hot Springs, Castlegar, and Cranbrook, with legs extending to the default airports of Victoria (CYYJ), Vancouver (CYVR), and Smithers (CYYD).

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My aging system: PIII 750Mhz, 256MB RAM, Radeon 8500 (64MB), 20GB HD, Windows 98SE.

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