

### Credits

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- Thanks to JL West for time spent on a new flight plan creation utility as well!

### Introduction

Thanks for purchasing WorldTraffic! For existing users, please check out the installation instructions for notes on updating the application. This application provides realistic AI aircraft across the X-Plane world using real-world flight schedules. It will also generate random general aviation and military traffic. It can even generate ground vehicle and boat traffic.

The aircraft flight model is advanced using standard physics equations for lift, drag, aoa, inertia, acceleration, etc. Aircraft are affected by weather in X-Plane including wind and wind gusts, elevation and temperature. A plane will require more runway to takeoff on at airfields with high elevations and higher temperatures for example.

The application is designed to run with minimal effort but lots of tuning and customization may be done for airport operations and flight paths if desired. To get going quickly, follow the installation and setup instructions in the the first two sections and then the quick start section <u>3 Running World Traffic</u> (Quick Start). If you want to change the default preferences refer the World Traffic Utilities and Settings section <u>5 Utilities and Settings Menu</u>. If you want to use World Traffic ATC refer to section.<u>4</u> WorldTraffic ATC. If you have questions or need help, I'm often on discord and my contact info is listed in section <u>1.6 Support</u>.

## **Table of Contents**

1 Installation/Update Instructions	<u>5</u>
1.1 World Traffic 3.5 Changes	
1.2 Updating World Traffic 3	6
1.3 Installing World Traffic 3	6
1.3.1 Installing the WorldTraffic Application on Windows	6
1.3.2 Installing the WorldTraffic Application on Mac and Linux	7
1.3.3 Installing Aircraft and Flight Schedules	7
1.4 Activation.	
1.5 Demo Mode	8
1.6 Support	<u>9</u>
2 Setup	
2.1 Assigning Keys	10
3 Running World Traffic (Quick Start)	11
3.1 Generating Flights and Entering your Flight Plan	
3.2 Airport Operations	<u>16</u>
4 WorldTraffic ATC	<u>17</u>
4.1 Airspace Classification	<u>17</u>
4.2 Airport Terminal Information Services (ATIS)	18
4.3 Departure from Controlled Airports	18
4.4 Enroute	
4.5 Arrival	
4.6 Holds	23
4.7 Flying VFR	
5 Utilities and Settings Menu	
5.1 Display Flight Info for Airport	<u>26</u>
5.2 Display Flight Info	<u>27</u>
5.3 Display Parking Assignments	<u>28</u>
5.4 Display Arrival Runway Queues	
5.5 Display Departure Runway Queues	<u>31</u>
5.6 Enable/Disable Regions	<u>33</u>
5.7 Preferences	
5.8 Particle Preferences	36
5.9 Label Preferences	
<u>6 Radar</u>	
6 Parking Assignments Editor	
6.1 Adjusting Parking Assignments	
6.2 Testing Taxi Routes	
6.3 Creating Fixed Taxi/Ground Routes for a Specific Airport	
7 Airport Operations Files	
7.1 Runway Operations	
7.1.1 OPERATIONS	
7.1.2 RUNWAY_OPS	53
7.2 Aircraft Operations	
7.2.1 Runway Configuration	
7.3 General Airport Settings	

7.3.1 Miscellaneous Settings	<u>56</u>
7.3.2 Landing Time Buffers	57
7.3.3 Takeoff Separation Time Buffers	
7.3.4 Required Takeoff Times	<u>58</u>
7.4 General Aviation Traffic Settings	
7.5 Airspace Dimensions.	59
7.6 VFR Airspace Exit Points	60
7.7 Bridges.	
7.8 Navigraph SID/STAR/Approach Settings	
8 CreatingCustom Routes	64
8.1 Custom Routes	64
8.1.1 Tabular Route File Format	
8.1.2 Non-Tabular Route File Format	65
8.2 Custom Routes for Scheduled and Randomly-generated flights	70
8.3 Custom Visual Approaches	72
9 Building Aircraft for WorldTraffic	
Appendix A – World Traffic Datarefs	

# **1 Installation/Update Instructions**

Please read the following section as there are important notes for developers and users regarding the WorldTraffic 3.5 update.

**MAKE SURE X-PLANE IS NOT INSTALLED in the Program Files folder if you are using Windows.** X-Plane will not run correctly and WorldTraffic will not be able to create fixed parking defitions files or taxi (ground) routes if installed in that folder. Read this for more info:

https://forums.x-plane.org/index.php?/forums/topic/82222-do-not-install-x-plane-in-the-program-files-folder/

### 1.1 World Traffic 3.5 Changes

World Traffic 3.5 is a major update with lots of new features. The full change list can be found here:

https://classicjetsims.com/WorldTraffic/newFeatures.html

WorldTraffic 3.5 is designed to run much more automatically than previous versions. Ground Routes (Taxi Routes) are now obsolete and are automatically generated in memory reducing initialization time by quite a bit. They can still be used however, if there are specific routes that work better than the auto ones. Parking Definition files are now only generated if the user wants to change default data that comes from the X-Plane apt.dat files. Most often a parking def will only be generated if the user wants to specify a parking spot as being associated with an international terminal or if the user wants to add/change aircraft and/or operators easily instead of having to edit the apt.dat file in WED. Pushbacks also work much better now and handle various cases of taxi networks with the taxi network going through the parking spot or past it so this info is normally not required to be entered in the Parking Def files.

### 1.2 Updating World Traffic 3

If you are updating an existing version of WorldTraffic, note that this version is designed to run much more automatically so Ground Routes (Taxi Routes) are now obsolete and Parking Defs are often not required. I strongly recommend moving/renaming/deleting the ground routes folder so they are not used. The only reason a fixed ground route would still be used is if for some reason the auto taxi routes don't work for a specific path. The folder is here:

XPlane\ClassicJetSimUtils\WorldTraffic\GroundRoutes

Normally only a few fixed ground route files should be included with an airport in an airport package created by scenery developers where the auto ones don't work as desired in regards to the route path.

Loading fixed ground routes can add up to a couple of minutes to the initialization time. You can also set the "Use Dynamic Taxi Routes Only" check box (checked by default) in the Airport Operations window for specific airports so that only the new dynamic taxi routes are loaded. You can uncheck this box if you want to used fixed ground routes and if any are found for a specific taxi route they will be used instead of the dynamic ones, otherwise dynamic ones will always be used when no fixed taxi routes are found. A future World Traffic update will allow the airport developer to specify an alternate taxi network file for specific parking spots if they want to create specific routes if the auto ones are not working as desired.

### 1.3 Installing World Traffic 3

### 1.3.1 Installing the WorldTraffic Application on Windows

Run the installer executable. Accept the agreement terms and you will get a menu showing items that can be installed.

🌐 World Traffic 3 Setup		– 🗆 X
Choose Components Choose which features of Work	d Traffic 3 you want to install.	Classic Jet
Check the components you war install. Click Next to continue.	nt to install and uncheck the compo	nents you don't want to
Select components to install:	<ul> <li>✓ World Traffic 3</li> <li>✓ Navigraph Data</li> </ul>	Description Position your mouse over a component to see its description,
Space required: 10.9 MB		
Nullsoft Install System v3.02.1 —	< Back	Next > Cancel

Pick the folder that the main X-Plane executable resides in. Don't pick any other folder unless you want to copy files manually to the correct locations. Installation of World Traffic 3 itself is complete but make sure to download the aircraft and flight schedules now as outlined next.

🌍 World Traffic 3 Setup	_		×
Choose Install Location	Classic	Jet State	LATIONS
Choose the folder in which to install World Traffic 3.	WORL	D TRAF	FIC 3
Setup will install World Traffic 3 in the following folder. To install in a Browse and select another folder. Click Install to start the installation		older, click	
Destination Folder D:\X-Plane 11\	Bro	wse	
Space required: 10.9 MB Space available: 778.0 GB Nullsoft Install System v3.02.1	nstall	Canc	el

If you are updating from previous versions of World Traffic, don't bother installing the Navigraph data as it was already included in the full version. The Navigraph database contains information on SIDs, STARs, and Approaches for the world's airports. Click the Next button to get to the next screen. The Navigraph data included with this version of WorldTraffic is from Sept. 30, 2020. You can get the most up-to-date data from Navigraph here: <u>https://navigraph.com/</u>

Their installer will auto-update WorldTraffic navigraph data along with Navigraph data used by X-Plane. If you don't want to subscribe to Navigraph, that's ok, WorldTraffic can run with older data and will do its best to sort out mismatches between X-Plane and Navigraph data in regards to runway numbering which may have changed.

Navigraph data is kept in this folder: X-Plane\ClassicJetSimUtils\NavigraphData

### 1.3.2 Installing the WorldTraffic Application on Mac and Linux

There is no installer at this time for these operating system. Download either the complete zip file if you have not installed WorldTraffic before or have an old version, or download the update zip file if you have WorldTraffic already installed. There is a readme.txt file in each zip file specific to each update with installation instructions but it requires you drag the folders to the specified locations. **NOTE: for Mac users, always merge in the files, don't replace the existing folders!** 

### 1.3.3 Installing Aircraft and Flight Schedules

Go to the World Traffic 3 web site to get all application updates, flight schedules and aircraft: <u>http://www.classicjetsims.com/WorldTraffic/updates.html</u>

Aircraft and Flight Schedules are managed by a separate group of folks and they do an awesome job of keeping the flight schedules up-to-date and the aircraft in the latest paint schemes.

To verify correct installation of aircraft and flight schedules, you should have this folder structure:

- X-Plane\ClassicJetSimUtils\WorldTraffic\AircraftTypes <- all the .txt files
- X-Plane\Custom Scenery\WorldTraffic\_Library\Aircraft <- all the object and texture files
- X-Plane\ClassicJetSimUtils\WorldTraffic/RouteFiles/AFRE\_Real\_Traffic <- all of the flight schedule files. NOTE: Always empty this folder before installing new files as the file names can change and you will end up with duplicate schedules if you don't.

### 1.4 Activation

After you purchase WorldTraffic, you will receive a serial number. After you install World Traffic as outlined in section <u>1.3 Installing World Traffic 3</u>, type the serial number into the World Traffic registration window found from the **X-Plane – Plugins – World Traffic** menu as shown below.

🔳 X-S	ystem					
File	Flight	View	Developer	Plugins		
				Plugin Admin	>	
				ReloadPlugins	>	
				Data Ref Editor	>	
				Datarefs for traffic lights (SASL)	>	
				Virtual Camera	>	
				Airfoillabs	>	
				SAM	>	
				SmartCopilot	>	
				SASL	>	
				Formation	>	
				World Traffic Radar	>	
				World Traffic	>	Flight Setup
						Parking Assignments
						Generate Ground Routes for Airport
						Registration
						About

After you type in the serial number in the dark grey edit box, click the Activate button.

×	Registration	×
1		
	Product Serial Number:	
	Unregistered Version	
	Please enter the serial number that came with your order into the box below.	
	Activate	

The text on the form will change to indicate that you have a registered version and the edit box and activate button will disappear if you enter the serial number correctly. The key is saved in a file called WorldTrafficKey.txt and is created in the XPlane/Resources/Plugins/WorldTraffic folder.

### 1.5 Demo Mode

WorldTraffic runs in demo mode if it's not activated. In demo mode full traffic at KSEA can be

generated.

## 1.6 Support

- **Discord:** You can find me on discord quite often. Click this link to join the WorldTraffic support forums there: <u>https://discord.gg/h4AARy5CyF</u>
- Email: Contact me by e-mail at greg.hofer@shaw.ca
- **X-Plane.org WorldTraffic forum:** The WorldTraffic forum at x-plane.org is here: <u>http://forums.x-plane.org/index.php?showforum=176</u>

# 2 Setup

### 2.1 Assigning Keys

You will need to setup a few keys to control World Traffic and the World Traffic Radar. From the X-Plane configuration menu, select the Keyboard option to display this screen. Near the bottom, you will see an entry called "cjs". Open that and then select the "world\_traffic" entry to display a list of keys that can be assigned. You can see the keys that I've used below. I recommend using the same ones, but it's optional. You don't need to define keys for every command, but you'll definitely need some for the Radar, ATC, the Utilities and Settings Menu, Resynchronize Flight Plans, and the Track Camera. Note that the "Utilities and Settings" menu was formerly called the "Key Command" menu.

All	+ Time	
Essentials	+ Views	
rently Assigned		
in Provided	— cjs	
	+ formation	
	+ texanii	
	— world_traffic	
	— world_traffic_radar	

The "Resynchronize Flight Plans" or Resynch key is quite important. If you change the time after you've loaded or generated flights, you should resynch so the aircraft are in their proper spots in their flights and so you don't get a hundred planes trying to depart all at once if you've advanced the time.

# **3 Running World Traffic (Quick Start)**

To get AI aircraft generated quickly, follow the instructions in the next section. Enter your flight plan information and click the **Create Flights** button and you're good to go. You may also now use the build-in ATC but that is optional. The subsequent sections describe WorldTraffic in greater detail describing various utilities like the flight information window, how to set preferences for such things as labels and contrail effects and how to finely tune operations at specific airports.

## 3.1 Generating Flights and Entering your Flight Plan

World Traffic will start automatically when you start X-Plane. After you've placed your aircraft at an airport, open the World Traffic Flight Setup menu option as shown below:

File	Flight	View	Developer	Plugins		
				Show Plugin Admin		
				ReloadPlugins	>	
				*A Better Camera (ABC)	>	
				> Aircraft Tracking	>	
				Data Ref Editor	>	
				instancing_sample2	>	
				SAM	>	
				SmartCopilot	>	
				World Traffic Radar	>	
				World Traffic	>	Flight Setup
						Parking Assignments
						Airport Operations
						Generate Ground Routes for Airport
						Registration
						About
					_	

This will open this window:

X Flight	Setup X				
Aircraft ICAO Name       MD82       Ar         Operator ICAO       UAL       Ar         Callsign       UAL220       Ini         Aircraft Type       Large Jet       De	eparture Airport ICAO KJFK rival Airport ICAO KSEA rival Airport Winds 271 Deg 12 Kts tial Crusing Altitude (ft) 36000 eparture Time (HH:MM) 18:05 rival Time (HH:MM) 23:15				
Flight Plan Loading and Generation Setup Enroute Tra	ffic Density				
64 г	percent				
Arr/Dep Airport	Traffic Density				
100 percent					
	rival and Departure Airports (Nm)				
10	Nm				
If you wish to see or change which runways are active for your departure and arrival airports, click the button below. Airport Operations Generate Scheduled Flights (Airline and Cargo Flights) Generate General Aviation Flights					
Create	Flights				

#### **Top Section – Flight Planning Information**

**NOTE:** There may be a pause after typing in the last character of the arrival airport as taxi network data and runway data is loaded for this airport.

The top section of this window is primarily used for providing information about your aircraft to WorldTraffic ATC and to display your aircraft information on the Flight Information screen and on the radar. Most of these values are informational only but your operator ICAO code needs to be correct in order for proper taxi routes to be determined to suitable gates and the destination airport ICAO needs to be correct.

If you're not using WorldTraffic ATC, then you only need to enter the arrival airport ICAO and arrival airport wind.

The following fields are requested:

- Aircraft ICAO Name The ICAO aircraft name of the aircraft you're flying. If you want to use real-world names, here's a <u>list of names</u> for most of the popular aircraft.
- **Operator ICAO Name** The ICAO name for the airline or operator of your aircraft. Here's a <u>list of ICAO Operators</u>. This value is used to find suitable taxi routes for your aircraft.
- **Callsign** For an airliner flight, this would be your flight number. It usually includes the operator ICAO code. For example, for American Airlines flight 684, the callsign would be AAL684. For a GA plane, the callsign would be your aircraft tail number. For military aircraft, they often have cool names like Dagger1, Bandit2, Tanker, etc.
- Aircraft Type Automatically determined for the aircraft you're flying.
- Have FMS/GPS this is normally set as checked for most planes except for light props but you can check that. It affects ATC communication so that ATC will not ask light GA planes to follow SIDs or STARs.
- IFR Flight Check this if you're flying IFR. This is used by WorldTraffic ATC.
- Departure Airport ICAO Automatically set to the airport you are currently at.
- Arrival Airport ICAO Note that there may be a pause after typing in the last character of the arrival airport as taxi network data and runway data is loaded for this airport. This must be entered correctly. This is the airport ICAO name of the airport you're flying to. You can read this from inside of X-Plane by selecting an airport, or you can google it. World Traffic will generate flights to and from the departure and arrival airport as well as generate taxi routes for both of those so when you get there, there will be arriving and departing traffic.
- **Cruising Altitude** The altitude you wish to cruise at, used by ATC.
- **Departure/Arrival Times** These are your estimated times. These will be displayed in the Flight Information window described later on.
- Arrival Airport Winds This is used to determine what the active runways will be at your destination. See section <u>7 Airport Operations Files</u> for more information.
- **Departure Heading** This field is only displayed if the Arrival and Departure airports are the same which implies an out and back flight. In this case ATC will want to know the heading that you wish to depart on.
- Import Flight Data from FMS Button Clicking this will import the arrival airport name and cruising altitude from the entered flight plan in the user's FMS.
- **Pre-Select Parking Spot at Arrival Airport Button** Clicking this will display a list of parking spots applicable to your aircraft type and operator. Select one from the list to reserve this parking spot for you at the arrival airport and upon landing, ATC will give you give taxi directions to this location.

#### **Bottom Section – Flight Generation Options**

The middle section of this window show the various options you can set when generating your flights.

- Enroute Traffic Density slider This sets the density for enroute traffic, traffic that doesn't start or end at your departure or arrival airport. Set the slider lower for better performance or if you get a warning message when creating flights that the flight queue is full. This causes flights to be generated within a 80 nm radius of your starting and arrival airports and all points on the route in between them.
- Arr/Dep Airport Traffic Density slider This will scale back the flights that get loaded or generated. If you are loading flights for an area that has 1000 flights, and you have the traffic density set to 70, then only about 700 flights will get loaded. You may also want to lower this if you are finding all of the gates at your airport occupied with traffic or if you get lots of messages saying that parking spots couldn't be found for created flights. To me it seems that there are too many flights in the schedules so I usually set this to maybe 70% or 80% for busy airports.
- Flight Plan Load Radius for Arrival and Departure Airports slider This slider value is ignored if the Enroute Traffic slider is set to a positive value and will default to 80 Nm. It is primarily used if you're just flying in your local area. Flight plans will be loaded at all times for your arrival and departure airports. World Traffic will also load flight plans for the airports in the surrounding area up to a certain distance from your airport as determined by this slider. It is recommended to set this to the maximum value unless you are in a very busy area and too many flights are getting loaded and a message saying that the flight queue is full.
- Generate Scheduled Flights Radio Button Check this to generate scheduled airline and cargo flights.
- Generate General Aviation Flights Radio Button check this box if you want GA traffic added to your airports. The traffic will only get added if parking spot definitions are defined at airports for GA aircraft. The number of GA flights for specific airports can be set in the Airport Operations file for an airport. See the section <u>7 Airport Operations Files</u> in the manual for more information.
- Airport Operations button Click this to go to the airport operations window to set active runways. See section <u>3.2 Airport Operations</u> below for more information.
- Create Flights button After setting all of the information in the top two boxes as desired, click this button to generate flights. You should see air and ground traffic now at your airport as well as parked aircraft.

**NOTE:** You may also commandeer one of the existing AI flights that will be departing. If you go to the "Flight Information for Airport" window as described in the section <u>5.1 Display Flight Info for</u> <u>Airport</u> and you want to fly one of the scheduled flights instead of having an AI aircraft fly it, scroll down through the list of departures until you find the flight that you want to fly. Presumably the flight is occurring at a future time and will be highlighted in green. Press the "Designate" command hotkey that you defined in section <u>2.1 Assigning Keys</u>



After you designate a flight, it will be invalidated, the AI aircraft will be deleted (gets highlighted in red), and the flight information will be copied into your own flight details in the Flight Setup window. When you arrive at the destination airport and when you park, the details for next leg of the flight for the specific aircraft tail number will be copied into your Flight Setup window as well so you can fly the entire weekly scheduled route of any aircraft if you desire.

Note in the example above the red highlighted flights in both the arrivals and departures columns. The arrival flight is for the same aircraft tail number as the departing flight (N163US). In the above example, the arriving flight to your current airport, KLAS, came from KPHX and landed at 18:16. The current time is 19:07 and you are scheduled to depart KLAS back to KPHX at 19:35.

### 3.2 Airport Operations

This window can be opened by clicking the Airport Operations button on the Flight Setup Menu or by selecting the menu option from the X-Plane – Plugins – World Traffic – Airport Operations menu. WorldTraffic will automatically select runways when you create flights based on the active winds and the settings in your airport operations files (if they exist). You may want to change them though in cases where you are interacting with a  $3^{rd}$  party ATC system which has different runways set as active.

This brings up the following window showing active runway selections for your departure and arrival airports.

X Airport Operations			
Departure Airport: KJFK Runways 13R/31L - 31L ACTIVE for ARR/DEP 13L/31R - 31R ACTIVE for ARR/DEP 4L/22R - 22R ACTIVE for ARR/DEP 4R/22L - 22L ACTIVE for ARR/DEP	Arrival Airport: KSEA Airport Operations Deparation 0 Deparation 1 Deparation 2 Operation 3 Deparation 4 Deparation 6 - ACTIVE Deparation 7 Op Name: Northern Winds Morning B4R - ARRIVAL B4R - ARRIVAL B4R - ARRIVAL		
Cycle Active Runway Config	B4C - ARRIVAL B4L - ARRIVAL		
<ul> <li>Use Dynamic Taxi Routes Only</li> <li>Tie Down Spots as defined in WED require push-back</li> </ul>	Note that Arrival Airport winds used to determine active runways are set from the Flight Setup Window.         Image: Setup Window         Image: Setup Window <tr< th=""></tr<>		
Reset Active Runways to Default	Save Airport Operations Files Reload Airport Operations Files		

The list of active runways is displayed in two formats. For airports with defined airport operations like KSEA on the right, the specific operation can be selected from the top box and with each operation a list of active runways is shown in the bottom box.

For airports with no defined airport operations, like KJFK on the left, one box is shown with a list of all defined runways. Select the runway of interest by clicking on it. Then click the "Cycle Active Runway Config" button to change which runways are active or disabled entirely.

For the arrival airport, WorldTraffic, will use the arrival airport winds as set in the Flight Configuration window to pick default active runways but the user may override those in this window.

If you click the button to save the Airport Operations file, a file will be created with the default options that can then be modified. You only need to create this file once to write the default values to a file. If you are using an older version of WorldTraffic and have older Airport Operations files, you should also resave the file so that new data is included. The old data will not be overwritten, it will just be reformatted to fit the new spec. Once this file has been saved and modified all airport operations configuration will be read from this file. The Airport Operations file will be generated in the XPlane/ClassicJetSimUtils/WorldTraffic/AirportOperations folder.

See the section **7 Airport Operations Files** on the Airport Operations file format.

A user interface will be created for the Airport Operations file for a future WorldTraffic update but the generated file has a lot of comments in it on how to edit the fields so don't be scared to take a look at it and give me a shout on discord if you need help or have questions.

## 4 WorldTraffic ATC

World Traffic 3.5 has a new ATC system that lets you fit in with the AI planes controlled by World Traffic. There are two preferences that you can set as well from the **Utilities and Settings Menu** – **Preferences** option. One lets you turn the option on or off to auto-tune the radios to the appropriate ATC frequency. The other option turns on or off auto-hide option for the ATC window so when set to on, the ATC window only appears if ATC conversation is required.

Press the CTRL-A key or whatever hot key you defined for ATC and the ATC window will appear. This window functions in VR as well.



The ATC window has 3 boxes as shown above:

- **Upper box** This displays the message history with user messages shown in yellow and ATC messages shown in green.
- **Middle box** This shows current ATC message options if any on the left and it shows available ATC frequencies on the right for the current airport. There is also an option highlighted in red that can be clicked on to cancel the current flight which will set ATC back to its initial state.
- Lower box This shows current state information and the last ATC instructions for speed, heading and altitude, if applicable, and the current frequencies tuned in to both COM radions.

The ATC system is context-sensitive in that you will see a list of applicable instructions for your current state if applicable. If the auto-tune radio option is selected, most of the time you will only need to scroll to the appropriate ATC request and hit the Enter key. The next WorldTraffic update will have an option to automatically select those options when appropriate as well as if the co-pilot is operating the radios. For example when you approach the active runway when departing it will automatically notify ATC for you that you are holding short of the active runway.

## 4.1 Airspace Classification

WorldTraffic uses airspace classifications to determine airspace sizes and altitudes around all airports. All Class B airspace in the U.S. are hard-coded into the application using a published list of Class B airports. All other airports are classified based on other data such as ATC frequencies available and the size of the airport to determine if the airport is controlled or not. The user may view or change the airspace dimensions in the Airport Operations file. See section <u>7.5 Airspace Dimensions</u> in the manual for more information.

All known "center" areas are also modelled which the user should stay in contact with when flying IFR outside of controller airspace in Class E airspace. The file

"XPlane/Resources/default\_scenery/default\_atc\_dat/Earth\_nav\_data/atc.dat" is used to determine available center areas.

## 4.2 Airport Terminal Information Services (ATIS)

When flying out of an airport that has ATIS information, the first step required of you is to listen to this information. WorldTraffic has it's own method for determining ATIS information using X-Plane weather and the active runways as set by the user in the Airport Operations menu described in section **<u>3.2 Airport Operations</u>**. When tuned into the ATIS frequency, this information will be displayed on the top part of the screen and audio will play giving the information. If you listen to it, the information name will be used by the user when contacting ATC. So make sure you on your best behaviour and listen to ATIS before contacting ATC. The ATIS frequency for your current airport is shown in the middle box and if you tune one of your radios to that frequency (or use the auto-tune option), it will be displayed in the bottom box as shown below.



### 4.3 Departure from Controlled Airports

Controlled airports can have a variable number of frequencies. Some don't have a clearance delivery frequency. Others may only have a Tower frequency. WorldTraffic will display the list of frequencies available and only provide you with appropriate options for talking to ATC. In the example below, a clearance delivery frequency is available so your option is to contact clearance delivery with your requested runway. If you've specified an arrival airport, that will be relayed to ATC. If your arrival airport is the same as your departure airport, you will ask for departure in the direction as entered in the departure heading field in the Flight Setup window.

•	WorldTraffic ATC	þ
Message History		09:00:32
ATC Message Options Contact Clearance Delivery with departure run > 31L 31R 22R 22L	way request	KJFK Airport Information ATIS - 128.725 Clearance - 135.050 Ground - 121.650 Tower - 119.100 Departure - 123.700 Center - 125.325 Click to Cancel Takeoff
ATC State: Displaying Avail Runways ATC Coms: COM1 - 135.050 / CLNC DEL COM2	- Not selected	

Move the cursor up or down to select your desired departure runway and you'll see the message history and state info update as shown below:

•	WorldTraffic ATC		ļ
Message Hi: KJFK CLD UAL220	story Clearance approved. Use SID JFK5.31L for departure. Squawk 6651. Contact o Have ATIS information delta, requesting clearance to KSEA	09:00:49 ground on 121.650 09:00:46 09:00:36	
	to valid ATC frequency ilable on 121.650	KJFK Airport Information ATIS - 128.725 Clearance - 135.050 Ground - 121.650 Tower - 119.100 Departure - 123.700 Center - 125.325 Dep Rwy - 31L / 312 deg	
	Displaying Clearance Delivery Info COM1 - 135.050 / CLNC DEL COM2 - Not selected		

The user's request is shown in yellow in the history box along with the zulu time. The user is requesting clearance to desired destination airport. ATC approves the clearance as shown in the green text, provides you with a transponder frequency and gives you the frequency for ground control. After changing frequency to ground control, there is one option to request taxi to the active runway. A taxi path is given along with any required hold points. In the below case, the user must hold short runway 22R on the way to active runway which is 31L (displayed on top line of Message History).



The user will report holding short runway 22R and ATC will tell you to continue holding short if there is traffic on the runway or will give you clearance to cross the runway and continue taxiing to runway 31L. When arriving at runway 31L, the user will report holding short and will be asked to contact the tower frequency when ready for departure as shown below:

•	WorldTraffic ATC	þ
Message His KJFK GND UAL220 KJFK GND UAL220	tory Contact tower now on 119.100 Holding short runway 31L Clear to cross runway 22R to runway 31L via Z and hold short. Holding short runway 22R	09:01:55 09:01:47 09:01:40 09:01:29 09:01:22
ATC Message > Ready fo		KJFK Airport Information Clearance - 135.050 Ground - 121.650 Tower - 119.100 Departure - 123.700 Center - 125.325 Dep Rwy - 31L / 312 deg Click to Cancel Takeoff
	Waiting for user to request takeoff COM1 - 119.100 / KENNEDY TWR COM2 - Not selected	

The tower will give an initial takeoff vector and ask you to contact the departure frequency. Again this whole process will change a bit depending on what frequencies exist for the airport. Once given the departure frequency, tune into it if not using the auto-tune option and an option will be displayed to announce your intentions as below:

•	V	VorldTraffic ATC	)	Ū
UAL220	story Contact departure on 119.200 Cleared for takeoff rwy 16L. Winds a Ready for departure 16L Contact tower now on 119.900	are calm. Climb rwy ho	ig to 5400 ft.	01:13:17 01:13:07 01:10:48 01:10:42 01:10:30
ATC Message > With you	e Options at 1400, climbing to 5400.			
Req Hdg: Req Speed: ATC State:	ction: FL360 164 deg N/A Wait user to contact departure COM1 - 119.200 / APP/DEP COM2 - No	Hdg: dETA:	3/5 - NEVJO 10.0 Nm 165 deg 0 / 0	

After this, ATC will vector you on the SID if one exists and then you will be handed off to center when clear of controlled airspace.

The bottom section of the ATC window when in flight gives you the last ATC-instructed values for altitude, heading and speed if applicable on the left. On the right side of the bottom section are the distance and heading to the next waypoint you are requested to fly to.

### 4.4 Enroute

Once enroute, you're on your own and asked to proceed as filed so you can follow your desired flight path to your destination. No vectors or collision avoidance instructions are given at this time.

•		WorldTraffic	ATC		Ð
Message Hi: CTR CTR UAL220 KSEA DEP	story Contact Oakland center on 132.200 Radar contact. Continue climb to With you at FL172, climbing to FL Contact Seattle center on 124.200	FL360. Proceed as	filed.		02:08:10 02:07:43 01:21:07 01:20:58 01:20:48
ATC Messag > With you					
Req Hdg: Req Speed: ATC State:	ction: FL360 N/A N/A Wait user to contact center COM1 - 132.200 / Oakland Center	D H d	st: dg: ETA:	KLAX 427.7 Nm 153 deg 0 / 0	

While enroute you may be asked to contract various center frequencies as you enter their airspace.

In the bottom-left part of the window, the assigned altitude is displayed. In the bottom-right part of the window the heading and distance to your arrival airport are displayed.

### 4.5 Arrival

Once within about 150 Nm of the arrival airport you will be assigned a STAR approach for a suitable active runway for your aircraft type.

•		٧	VorldTraff	ic ATC			þ
Message His CTR CTR CTR CTR CTR	Descend to FL14 Maintain curren Follow STAR WAY				25L		22:56:01 22:55:51 22:51:36 22:51:23 22:51:00
						Approach Tower - 1 Ground - Unicom - ATIS - 13 Arr Rwy -	121.650 122.950
	167 deg 270 Following STAR	WAYVE1 - Rwy 25L / Los Angeles Center	COM2 - Not	Wpt: Dst: Hdg: dETA: selected	1/7 - WAYVE 76.7 Nm 168 deg 2067 / 2074		

The middle section of this window now displays applicable frequencies for the arrival airport.

The lower section of this window now provides the last ATC instructions on the left and the distance and heading to the next waypoint that ATC expects you to fly to. When in doubt fly to the waypoint.

There are also 2 time fields on the bottom in the dETA section (delta ETA). The times are in XP system time so don't mean much but you can see if you are ahead of schedule if the time on the left is less than the time on the right. In the above case, the user is 7 seconds ahead of schedule. ATC would like you to stay on schedule to maintain separation to other arriving aircraft.

Once you are at the end of the STAR you will be cleared for an approach to the active runway. You are now on your own to follow the correct landing procedure. You will be cleared to land when on final or you may be instructed to go around if there is conflicting traffic.

**NOTE:** There are currently some bugs in WT 3.5.0b1 that may give you some weird speeds. For now, ignore and try and stay on schedule. If not, don't worry, any planes too close ahead or behind you on final will be assigned missed approaches.

### 4.6 Holds

You may also be requested to follow holding patterns on arrival to ensure separation on landing. Holding patterns are to the right unless specified otherwise. ATC will may ask you to hold at the upcoming waypoint. Upon reaching it, do a 180 degree turn to the right. ATC will also tell you when to turn back to the waypoint and you may be given a new lower altitude as well as at busy airports, aircraft can get stacked in these. When you are not required to perform any more holds, you will be instructed to proceed on course.

## 4.7 Flying VFR

If you want to fly VFR, make sure to uncheck the box "IFR Flight" on the Flight Setup window described above in section <u>3.1 Generating Flights and Entering your Flight Plan</u>. Also specify your Departure Heading if the arrival and departure airports are the same so ATC knows on what heading to vector you out of the airspace at a controlled airport.

VFR airspace exit points may be defined for an airport in the Airport Operations file if you want ATC to vector you to common landmarks. See section <u>7.6 VFR Airspace Exit Points</u> for more information.

The departure airport will address you using the callsign you typed in the Flight Setup window above in section **3.1** Generating Flights and Entering your Flight Plan. Cursor down to the desired runway and press the Enter key and taxi instructions will be provided to you assuming that you are parked at a recognized gate with auto-generated or user-defined taxi routes.

You will also be given a SID departure to follow if any exist for your airport. No ground control is provided but the World Traffic AI planes will not run into you from behind so follow the instructions to your departure runway. Note AI planes will go through you if approaching you from head-on. Taxi networks are not dynamic so there is no other option, otherwise planes approaching head-on would stop forever waiting for the plane in front of it to get out of the way.

When approaching the runway hold point, contact ATC again by pressing the ATC key to notify WT that you are holding short of the active runway ready for takeoff. ATC will either tell you to taxi into position and hold, give you takeoff clearance, or ask you to wait for approaching traffic. Once given takeoff clearance, you will be given vectors to follow the outbound SID or just basic "climb runway heading" instructions if no SIDs exist or if you are flying a GA plane not equipped with an FMS.

Once enroute, WT will start checking for STARs once you get within 150 Nm of your destination. You will be give the STAR name and you will be vectored to follow it in and then onto approach and landing. For non-FMS equipped planes, arrival instructions will be more basic and follow general circuit instructions.

## **5 Utilities and Settings Menu**

This was formerly called the key command menu. It allows you to change several settings and has a few utilities for such things as viewing airport arrivals and departures, looking at runway takeoff and arrival queues, and viewing parking spot data.

To bring up the menu, press the hot key that you defined for it as outlined in section 2.1 Assigning Keys. The following menu appears with the available options. Note when navigating the Utilities and Settings Menu, use these keys:

- Arrow keys to move up/down, left/right and up/down arrows to cycle through options.
- Backspace key to go back to the previous menu and to exit the Utilities and Settings Menu.
- Enter key to select a new menu or to select an option.

•	WorldTraffic Utilities and Settings	D
> Display Flig	ght Info For Airport	
Display Flig	yht Info	
Display Park	king Assignments	
Display Arri	ival Runway Queues	
Display Depa	arture Runway Queues	
Enable/Disab	ole Regions	
Preferences		
Particle Pre	eferences	
Label Prefer	rences	
Resync		

### 5.1 Display Flight Info for Airport

Open the Utilities and Settings Menu and select the first option, "Display Flight Info for Airport". A menu similar to that below will be displayed.

•		Fliç	ght In	form	ation for	Airport			Ð
AIRPORT:	KJFK CL	JRRENT Z	ZULU TII	ME: 15	:34 - Sat 3	3/19			
ARRIVALS					DEPARTUR	RES			
Flight	Aircraft	Eron	Dep Time	Arr Time	Elicht	Aircraft	Ta	Dep Time	Arr Time
Flight DL5122	CRJ9	From KORD	13:50		Flight > DL2456	Aircraft A321	To KFLL	15:30	17:48
B626	A320	KTPA	13:20		GB152	B763	KCVG	15:30	16:53
DL5243	CRJ9	KOFW	12:34		SY244	B738	KMSP	15:35	17:48
AA95	B772	LEMD		15:44	UAL220	MD82	KSEA	15:38	23:15
DL671	B712	KBOS		15:47	B6864	E190	KHYA	15:41	16:19
AA2214	B738	KSAT	12:21		DL2282	B712	KMSP	15:41	17:53
DL107	B763	EDDF	08:35		DL423	B752	KLAX	15:45	20:40
DL49	B763	EHAM		15:48	B6479	A21N	MKJS	15:45	
AZ602	A332	LIRF	07:40	15:49	DL4165	E175	KCLT	15:46	17:03
EC8005	B752	LFP0	08:45	15:50	B6308	E190	KPWM	15:46	16:34
B6842	A320	KSAV	14:06	15:51	DL2593	A319	КТРА	15:46	17:59
B61633	BCS3	KBTV		15:51	861835	A21N	MTPP	15:47	19:00
B6154	A320	KPBI	13:32	15:54	DL5540	CRJ9	CYYZ	15:50	16:47
DL5022	CRJ9	KDCA	15:00	15:54	DL2571	B739	TJSJ	15:50	19:14
AV210	A319	SKB0		15:54	B6757	A320	TNCA	15:51	19:49
	Plan Name:				2DN_DL2456_	6 (8779)			
Speed:	289 kias		as 361	ktgs	Mach 0.58				
Altitud									
Heading									
Postio									
	pt: 5 / Wpt								
Wpt Dis	st: 37.2, R	oute Di	stance	Remain:	1ng: 866.4				

Move the cursor using the arrow keys to the AIRPORT field and type in the airport name that you wish to display information for (**use the left arrow key to erase characters!**). and a list of arrival and departure information will be shown for that airport. The airport name entered here will be used for all other menus which reference the current airport such as the ones showing arrival and departure runway queues. Flights in blue are in the air, flights in green are parked, and flights in yellow are taxiing. Moving the cursor down to a specific flight shows information for that flight on the bottom part of the window. If you click the Enter key, that aircraft will be shown in the Track Camera view.

All displayed times are in zulu time. A minus sign before the departure time indicates that the flight left on the previous day at that time and a plus sign before the arrival time indicates that the flight will arrive at that time on the following day. If you see a flight highlighted in red, scroll down the entry and an error will be displayed. Flights will be highlighted in red if no aircraft exist for that flight (or maybe you don't have the aircraft installed in the correct folders). They can also be highlighted in red if no ground route could be found, ie. no gates defined for that aircraft operator and aircraft type.

## 5.2 Display Flight Info

Open the Utilities and Settings Menu and select the option, "Display Flight Info". A menu similar to that below will be displayed.

Flight Information					
• User	0				
KPDX_KSEA_0229_N317CM_GB903_4					
KSEA_KCVG_0408_N317CM_GB903_4					
KCVG_KSEA_1115_N372CM_GB904_4					
KSEA_KPDX_1714_N372CM_GB904_4					
KPDX_KSEA_0234_N372CM_GB903_5					
KSEA_KCVG_0419_N372CM_GB903_5					
KCVG_KSEA_1102_N798AX_GB904_5					
KSEA_KPDX_1648_N798AX_GB904_5					
KPDX_KSEA_0243_N798AX_GB903_6					
KSEA_KCVG_0432_N798AX_GB903_6					
KSEA_KLAX_0449_N783AX_GB1817_4	11				
KLAX_KSEA_1158_N783AX_GB1917_4	12				
KSEA_KLAX_0454_N783AX_GB1817_5					
KLAX_KSEA_1154_N783AX_GB1917_5					
KSEA_KLAX_0458_N783AX_GB1817_6					
KSEA_EIDW_0225_EI-DAA_EI142_4					
EIDW_KSEA_1500_EI-DU0_EI143_5					
Flight Plan Name: User (0)					
Speed: 0 kias 0 ktas 0 ktgs Mach 0.00					
Altitude: 453 ft ASL					
Heading: 88 deg T					
Postion: 47.45715 lat -122.30244 lon					
State: Taxiing for Takeoff to Runway					

This is primarily used for debugging. It lists all created flights. Flights in blue are in the air, flights in green are on the ground. Moving the cursor down to a specific flight shows information for that flight on the bottom part of the window. It is recommended to use the previous menu, "Flight Information for Airport".

### 5.3 Display Parking Assignments

Open the Utilities and Settings Menu and select the option, "Display Parking Assignments". A menu similar to that below will be displayed.

•		Parking Assignments Infor	mation for KSEA
0		Al	AC Parked
1		C1	AC Departing
2		C10	Available
> 3		C2	AC Parked
4			Available
5		C4	Available
6		C5	AC Parked
7		Cargo_5-1	AC Parked
8		Cargo_5-2	Available
9		Cargo_5-3	Available
1		Cargo_5-4	
1		Cargo_5-5	Available
1		Cargo_5-6	
1		Cargo_5-7	
1		Cargo_5-8	
1			
1			
1			
		rators:	
		es MedProp LightProp	
		Cargo Only	
		il Only	
		International and Non-International Flight	
F	li	ht: KALW_KSEA_1851_N444QX_AS2079_5 (1725)	

This can be used to quickly move the camera to the selected parking spot to identify it easily and to see what aircraft (if any) is currently parked there for the current airport. The airport in use is the one entered in the "Flight Information for Airport" window. A short summary of the parking spot configuration is displayed along with the name of the flight currently parked there. This is a helpful tool to use along with the Parking Assignments editor as described in <u>6.1 Adjusting Parking</u> <u>Assignments</u> when tuning operations at an airport. You can scroll down through all of the entries to see details on all of the defined parking assignments. Each entry contains this info:

- Parking ID
- Parking Spot Name will match whatever it is defined as in WED and the exported apt.dat file. It is a good idea that these names are unique when building airport layouts so parking spots can be uniquely identified.
- State one of AC Parked, AC Departing, AC Arriving, Available

You can see specific details for the gate that you have cursored to. This information includes:

- Operators The names of the operators allowed at for the parking spot. This data is exported from the apt.dat file created in WED but can be modified using the Parking Assignments menu described in section 5.3 Display Parking Assignments.
- Types The aircraft types allowed for the parking spot. This data is exported from the apt.dat file created in WED but can be modified using the Parking Assignments menu described in section **5.3** Display Parking Assignments.
- Cargo Status can be Cargo Only, Non-Cargo Only, or can allow both. This info is set in the Parking Assignments menu described in section <u>6 Parking Assignments Editor</u>.
- Civil/Military Status can be Civil Only, Military Only, or can allow both. This info is set in the Parking Assignments menu described in section <u>6 Parking Assignments Editor</u>.

### 5.4 Display Arrival Runway Queues

Open the Utilities and Settings Menu and select the option, "Display Arrival Runway Queues". A menu similar to that below will be displayed.

•		Arr	ival R	unwa	y Que	ues	Ð
AIRPORT:	ksea runv	VAY: 16L -	use let	ft/right	arrow	keys to cycle runways	
Id	Flight	Aircraft	From	Dep Time	Arr Time	State	
0 2,9 8 7	DL2429	8712	KSF0	19:28	21:01	SHORT-FINAL	
0 0,4 5 3	AS767	8739	KDEN	18:46	21:07	APPROACH	
0 1,0 5 8	AS96	B737	PANC	18:29	21:09	APPROACH	
0 3,7 5 2	WN2380	B737	KPHX	19:00	21:13	APPROACH	
0 1,2 8 1	AS1007	A320	KLAX	19:26	21:15	APPROACH	
0 0,5 5 6	AS213	8739	KOAK	19:55	21:17	APPROACH	
0 2,0 6 9	5Y3024	B763	KCVG	17:50	21:19	APPROACH	
0 0,9 9 9	AS395	B738	KSLC	19:51	21:21	APPROACH	

To cycle through the available runways of the current airport, use the left or right arrow keys. The airport in use is the one entered in the "Flight Information for Airport" window. This is useful for airport designers where configuring airport operations at airports or may be of general interest to the user. The fields in the menu are as follows:

- Id The unique flight plan ID for the flight which is also shown in aircraft labels, the track camera window, the "Flight Information for Airport" window and on the radar display.
- Flight The flight name for scheduled airliner flights or the aircraft tail number for GA flights.
- Aircraft The ICAO aircraft name
- From The departure airport
- **Dep Time** The flight's departure time in Zulu format.
- Arr Time The flight's arrival time in Zulu format
- **State** One of "APPROACH", "FINAL" or "SHORT FINAL" depending on the aircraft distance to the runway. Planes will enter the arrival runway queue when assigned a STAR (or other) approach and will be removed when exiting the runway or when entering a missed approach.

### 5.5 Display Departure Runway Queues

Open the Utilities and Settings Menu and select the option, "Display Departure Runway Queues". A menu similar to that below will be displayed.

•		Depa	rture	Runw	ay Qu	eues		Ð
								_
AIRPORT:	KSEA RUN	WAY: 16L -	use lef	ft/right	arrow	keys to cycle	runways	
Has pla	ne on short	: O seconds t final: YE e in 85 seco	5 Arr			sing rwy: O runway: NO		
Id	Clarke A	A	<b>T</b> -	Dep	Arr	C+-+-	Wait	Thold
291	Flight AS57	Aircraft B739	To PANC	Time	Time 00:00	State TAXIING	Time	Dist
429	AS110	B739	KJFK		02:02	PUSH-BACK		
506	A5123	8739	PAFA		00:20	PRE-FLIGHT		
1106	AS71	B737	PAJN		23:07	PUSH-BACK		
1122	AS7004	8737	PAKT		22:39	PRE-FLIGHT		
2302	0Z271	A359	RKSI		06:26	PUSH-BACK		
3479	HU496	A333	ZBAA		07:07	PUSH-BACK		
2512	DL619	8739	KLAX		23:14	PRE-FLIGHT		
2482	DL019 DL2462	8752	KMSP		00:05	PRE-FLIGHT		
2402	DL240Z	0/52	NUSP	21:11	00.05	FNE-T LIGHT		

To cycle through the available runways of the current airport, use the left or right arrow keys. The airport in use is the one entered in the "Flight Information for Airport" window. This is useful for airport designers where configuring airport operations at airports or may be of general interest to the user. The fields in the menu are as follows:

- Id The unique flight plan ID for the flight which is also shown in aircraft labels, the track camera window, the "Flight Information for Airport" window and on the radar display.
- Flight The flight name for scheduled airliner flights or the aircraft tail number for GA flights.
- Aircraft The ICAO aircraft name
- **To** The arrival airport
- **Dep Time** The flight's departure time in Zulu format.
- Arr Time The flight's arrival time in Zulu format
- State One of "PRE-FLIGHT", "PUSH-BACK", "TAXIING" or "TAKEOFF" depending on

the aircraft taxi state. Planes will enter the departure runway queue at about 15 minutes before takeoff and will be removed when becoming airborne.

- Wait Time this is the time from when the aircraft is first ready to taxi onto the active runway until the current time. To prevent traffic jams, planes will only wait up to 500 seconds before departing.
- **Thold Dist** This is the distance of the aircraft from the takeoff runway's threshold, mostly for used in debugging.

The top section of this window also has some other informational fields as follows:

- Last takeoff time This was when the last plane departed. This time is used for separation of departing aircraft. The departure separation times are entered into a matrix in the Airport Operations file. See section 7.3.3 Takeoff Separation Time Buffers. For more information.
- Num planes crossing runway The current number of planes crossing the runway.
- Arriving plane on runway YES or NO. Needless to say, departing aircraft are not allowed to depart if there are planes crossing when further down the runway than the departing aircraft or if there is still an arriving plane on the runway.
- Next landing plane Estimated time of arrival for the next landing aircraft. Departing planes should not taxi onto a runway if they can not takeoff before the next landing aircraft. They will take into account holding time as well for any crossing planes or arrival planes on the runway as well as the separation time to the last departing aircraft.

### 5.6 Enable/Disable Regions

Open the Utilities and Settings Menu and select the option, "Enable/Disable Regions". A menu similar to that below will be displayed.

	Enable/Disable Regions	
AFRE_Real_Traffic		
LOWI		
LXGB		
TabularTest		
temp		
Test - Copy		
VanceAFB		
Washighton		
LOIJ		

This is used if the user has any user-defined flights that they wish to activate, otherwise it is not normally used. Enabled regions are shown in green and disabled ones in red. The first displayed Region is AFRE\_Real\_Traffic. This is a magic region that holds all of the scheduled airline and cargo flight files. It will be green if the box for "Generate Scheduled Flights" is checked on the Flight Setup window. All other regions can be activated or deactivated by moving the cursor down to the line and hitting the Enter key.

A region corresponds to the folder name in the "XPlane\ClassicJetSimUtils\WorldTraffic\RouteFiles" folder. If the user wishes to create any custom flights they can create a new folder here and place the flight plan files in this folder and activate it. After flights are created, the flight plans will become active. See section **8.1 Custom Routes** on the flight plan file formats for more information on how to create your own flight plans.

Flight plans can be created for ground and sea traffic as well as air traffic and are a fun way to customize the traffic at an airport that you fly from a lot.

### 5.7 Preferences

Open the Utilities and Settings Menu and select the option, "Preferences". The menu below will be displayed.

	Preferences
Set Max T	rack Camera Distance
Set AI AI	rcraft Volume
Toggle Pl	ugin Control Of Aircraft TCAS - Currently OFF
Display U	nscheduled Flights on Flight Board - Currently ON
Ground Ro	utes Required for Arrival Runways - Currently ON
Toggle Gr	ound Collision Avoidance - SIMPLE
Set AI Ai	rcraft Startup Time
Set Radar	Options
Display F	light Generation Info and Warnings - Currently ON
Sounds En	abled - Currently ON
Auto-tune	Radios - Currently ON
Auto Show	/Hide ATC Window - Currently OFF
Jetblast	Enabled - Currently OFF - Don't use if using an external weather app!
Follow Me	Truck - Currently OFF
WT - Proc	essing Enabled (TEST)
ParkingDe	f Logging - OFF (TEST)
ParkingDe	f Selection Logging - OFF (TEST)
Runway Al	location Logging - OFF (TEST)

This lets you set the persistent preferences used by World Traffic.

- Set Max Track Camera Distance The maximum distance out to which planes will be displayed in the track camera view. The default is 80 Nm which is the maximum range of the radar.
- Set AI Aircraft Volume The sound volume for AI aircraft engines.
- **Toggle Plugin Control of Aircraft TCAS** If you want WorldTraffic AI planes to show up on your aircraft's TCAS display, set this to ON. You no longer need to set AI planes in the X-Plane Flight Configuration menu. In fact you should normally set the number of AI planes to zero unless you are using another traffic app that needs them or possibly some ATC apps. To tell if it's working, press the "m" key in X-Plane to open the X-Plane map display. The closest 60 planes to the user should show on the map. If they don't show on a specific X-Plane aircraft TCAS display but do display on the X-Plane map, then the problem resides in the aircraft's TCAS display implementation.
  - Note that the World Traffic TCAS setting will go back to OFF if there is another plugin trying to use TCAS. The X-Plane log.txt file will show you this information. You will have to decide what plugin has control of TCAS as it it unfortunately can't be shared among plugins.
- Display Unscheduled Flights on Flight Board If you want random GA and military flight

traffic to be displayed in the "Flight Information for Airport" window, set this to ON.

- **Ground Routes Required for Arrival Runways** If this is ON it must be possible to find a taxi path between the runway and a suitable parking spot for a plane to land on this runway. If no taxi network exists for an airport, planes will land there regardless of this setting but will disappear after coming to a stop.
- **Toggle Ground Collision Avoidance** Head-on ground collisions are best avoided by airport authors where one-way taxi segments are used as often as possible in opposite taxi directions when it makes sense. Taking that into account and using ground collision avoidance options, head-on conflicts can be minimized. There are three ground avoidance collision options:
  - *OFF* Normally only used to get rid of traffic deadlocks should they occur.
  - *SIMPLE* planes will not run into aircraft if on the same heading but will not stop if approaching other aircraft head-on to prevent traffic jams
  - *COMPLEX* the functionality of SIMPLE plus planes will also hold for other aircraft approaching that will use the same taxi segments until the other aircraft is off the shared segment.
- Set AI Aircraft Startup Time Set this wait time as desired for planes to idle once the engines are started before they start to taxi.
- Set Radar Options The Radar Filter option can be set to only display local traffic (arriving or departing from the entered airport), to only display arriving traffic, to only display departing traffic or can be left OFF to display all air traffic in the area.
- **Display Flight Generation Info and Warnings** Set this to ON if you want to see the results of created flights such as if some parking spots couldn't be found for parked planes and taxi network info for the arrival/departure airports.
- Sounds Enabled Normally set to ON for AI aircraft engine sounds to play.
- **Auto-Tune Radios** Set this to ON if using WorldTraffic ATC and you want the radios to be tuned automatically to the appropriate frequency for the current aircraft state.
- Auto Show/Hide ATC Window If set to ON, the ATC window will disappear when on input is required by the user.
- Jetblast Enabled Set this to ON to model jet blast on the user's aircraft on the ground when close behind AI planes. Wind speed from engines is calculated using a published document on engine jet blast and is modelled for each engine on an AI aircraft engine. Don't use this option if you are using a third party weather app.
- **Follow Me Truck** Set to ON if you want a follow-me truck to lead you to the active departure runway. This currently does not work for arrivals in WT 3.5.0b1.
- WT Processing Enabled (TEST) Test option which will stop the plugin from running.
- **Parking Def Logging (TEST)** To log parking definition info. Leave as OFF to prevent sim pauses from log file writes.
- **Parking Def Selection Logging (TEST)** To log parking definition selection info. Leave as OFF to prevent sim pauses from log file writes.
- Runway Allocation Logging (TEST) To log runway allocation info. Leave as OFF to prevent

sim pauses from log file writes.

### 5.8 Particle Preferences

Open the Utilities and Settings Menu and select the option, "Particle Preferences". The menu below will be displayed.

•	Particle Preferences	D
> Set Max Planes to Display Particles		
Show Emitter Locations -	OFF	
Show Wing Contrails - ON		
Show Jet Engine Contrail	s - ON	
Show Tire Smoke - ON		
Show Afterburner Flame -	ON	

This is used to set the various particle effects available for WorldTraffic AI planes. They are very CPUintensive and can't be attached to each aircraft. Instead a small pool of them is created which are shared among the aircraft. Frame rates currently suffer if setting the max number of planes using particles at a time to more than 1 or 2.

- Set Max Planes to Display Particles the number of planes that can use contrail or afterburner particle effects at once. It is recommended to keep this at 1 or 2 to not kill frame rates.
- Show Emitter Locations This is for AI aircraft development. Set to ON to show from which part of the aircraft particle effects originate. The locations for particles are set in the aircraft definition files.
- Show Wing Contrails set to ON to show wing contrails. These are displayed as a function of outside air temperature, humidity and aircraft angle of attack.
- Show Jet Engine Contrails set to ON to show jet engine contrails. These are displayed as a function of outside air temperature, humidity and engine rpms.
- Show Tire Smoke set to ON to show tire smoke for any currently landing aircraft.
- Show Afterburner Flame set to ON to show afterburner flames for any aircraft equipped with afterburners.
### 5.9 Label Preferences

Open the Utilities and Settings Menu and select the option, "Label Preferences". The menu below will be displayed.

•	Aircraft Label Preferences	Ð
> Show Labels - ON for	planes in flight only	
Set Label Brightness	- DARK	
Calibrate Horizon Po	sition	
Set Minimum Draw Dis	tance	
Set Maximum Draw Dis	tance	
Color for Arriving P	lanes - BLUE	
Color for Departing	Planes - GREEN	
Color for Enroute Pl	anes - ORANGE	
Show Aircraft Teleme	ty - ON	
Show Aircraft Airpor	t Info - ON	
Show Aircraft Type -	ON	

WorldTraffic AI aircraft in flight can have labels attached to them and may be adjusted using these preferences.

- Show Labels set to "ON for planes in flight only", "On for planes in flight or on the ground" or OFF. A hotkey may also be setup to turn labels on or off.
- Set Label Brightness DARK or BRIGHT
- **Calibrate Horizon Position** This step may need to be done as I'm not sure of the algorithm to determine the pixel horizon position for some monitor display settings. When in calibration mode, a horizon line will be displayed. Use the arrow keys to move the horizon line up or down so that it matches the horizon position. You may also adjust it up or down if you want the labels to appear above or below the AI planes.
- Set Minimum Draw Distance below this distance, labels will stop displaying for aircraft.
- Set Maximum Draw Distance past this distance, labels will stop displaying for aircraft.
- **Color for Arriving/Departing/Enroute Planes** set the color as desired for these aircraft or turn the color off if you don't want some planes to have displayed labels. Arriving/Departing planes are those arriving at the closer of your departure or arrival airport. Enroute planes are those not arriving or departing from your departure or arrival airport.
- Show Aircraft Telemetry set to ON to display aircraft speed, altitude, heading and distance from user in the label.
- Show Aircraft Airport Info set to ON to display the aircraft's arrival and departure airport ICAO info in the label.
- Show Aircraft Type set to ON to display the aircraft type in the label.

# 6 Radar

World Traffic comes with a Radar display so you can see all flights in your area. Press the key you defined to display the Radar that as described in section 2.1 Assigning Keys. If you open the Utilities and Settings Menu and select the Preferences option, you can set the radar to show all flights in the area, only local traffic, only arriving aircraft, or only departing aircraft. If you click on an aircraft on the Radar display, it will turn read. Clicking the Track Camera button on the top-right of the Radar display will move the track camera to show the selected aircraft.

If you want your aircraft to be always at the center of the radar display, leave the aircraft box blank and click the "Select Airport ICAO" button.



# **6** Parking Assignments Editor

### 6.1 Adjusting Parking Assignments

Note that the terms taxi routes and ground routes are used interchangeably. Select the menu as shown below:

File	Flight	View	Developer	Plugins		
				Plugin Admin	>	
				ReloadPlugins	>	
				Data Ref Editor	>	
				Formation	>	
				World Traffic Radar	>	
				World Traffic	>	Flight Setup
						Parking Assignments
						About

A window will be displayed showing airports within a 5 mile radius of your current position (usually just a single airport).

× Parking A:	ssignments Airport Selection	×
Airports Close to You	Edit Airport Parking Assignments Show Operators using this Airport	1

Click on the airport that you wish to edit. If you click the bottom button, "Show Operators using this Airport", a list of operators and associated aircraft types will be displayed. The AFRE real traffic files are used to build this list and it can be useful for people creating airports to determine what type of gates should be defined. Below is an example for KLAS:



In the above example, the operator ASA (Alaska Airways) is selected. You can see that a couple of gates are defined for all of the Boeing 737 aircraft in World Traffic. There should probably be a lot more gates defined with so many flights per week. For the Dash-8s, no gates are defined so some should definitely be added so aircraft have a place to park. Note that this only shows parking spots with defined operators. If a parking spot has no operators defined (valid for any operator) it won't be counted in this list.

If the top button is clicked, "Edit Airport Parking Assignments", a window will open showing the various parking locations found similar to this below:

×	Parking Assignment Selection	×
Parking Assignments Aerocenter 1 Aerocenter 2 Aerocenter 3 Air Sprint Cargo 10 Cargo 11 Cargo 12 Cargo 14 Cargo 15 Cargo 16 Cargo 17 Cargo 18 Cargo 201 Cargo 201 Cargo 202 Cargo 203 Cargo 204 Cargo 205 Cargo 208 Cargo 210 Cargo 3 Cargo 4	Edit Parking Assignment	

Select a parking location and click the "Edit Parking Assignment" button.

×	Parking Assignment Edit	— X
Airport: KSEA Parking Assignment: S8	State: AC Parked Priority: 0	
Source Data Path: D:\X-Plane 11\Custom So	enery/KSEA Demo Area/Earth nav data/apt.dat	
	Allowed Aircraft Types	
Aircraft Selection Criteria Option	Super Heavy Jet (> 1,000,000 lbs - A-380, AN-225)	
Aircraft Type And/Or Operator	😿 Heavy Jet (> 255,000 lbs - eg. A-340, A-330, 747, 787, 777, 767)	
Aircraft Name	🗹 Large Jet (> 41,000 lbs - eg. A-318 - A-321, 757, 737)	
Aircraft Tail Number	Large Prop (> 41,000 lbs - eg. C-130, A-400, Dash-8 Q300/400)	
Parking Position Adjusment:	Medium Jet (> 19,000 lbs - eg. CRJs, ERJs)	
Fwd	Medium Prop (> 19,000 lbs - eg. Dash-8-100/200, ATRs)	
Left Right	Light Jet (< 19,000 lbs - eg. small business jets, jet trainers)	
Back	Small Prop (> 6,000 lbs - eg. King Air, PC-12, TBM-900, C-421)	
Heading (degT): 182	Light Prop (< 6,000 lbs - eg. Cessnas, Pipers, Baron, DA-42)	
👿 Auto Pushback Distance	Fighters (<100,000 lbs AND thrust:weight ratio > 0.5 - eg. F-15, SU-27)	
Initial Pushback Distance (ft):	Helicopters (must be selected on its own)	
246		
🗹 Auto Set Pushback Heading to Taxi Path	Operators (Type in up to 20 three-character ICAO Codes or enter NONE for GA Air KAL DLH ACA Operator ICAO Co	
	Parking Spot allows Civil Aircraft	
	Parking Spot allows Military Aircraft	
	Parking Spot only for Cargo Aircraft	
Select Parking Center Reference:	Parking Spot only for Non-Cargo Aircraft	
Door1	Parking Spot for Cargo or non-Cargo Aircraft	
Door2		
Main Wheels	Generation Options (leave runway blank for all) Regenerate Fixed Taxi Route:	5
Cata Tuba	Runway Test Fixed Taxi Routes	
Gate Type: Regional	Arrival	
International	Departure 🗹	
👿 Either	Enabled Test Dynamic Taxi Routes	

This screen allows you to set more specific details about parking locations than what X-Plane provides. Follows is a description of the various fields:

#### Top row

- Airport the ICAO name of the airport
- **Parking Assignment** the parking spot name as read from the apt.dat file for auto-generated ground routes or from the ground routes themselves for ground routes created using other tools.
- State the state may be available, in use by arriving aircraft or in use by departing aircraft.
- **Priority** These can be numbered from 0 to 99 with 0 being the highest priority. You might assign gates a lower priority that don't have jetways, are maintenance parking spots, ones that are for all operators or any other reason. The default value for all parking defs. Normally only tie-downs are set to have a lower priority of 1 so that planes will park at a spot with a jetway first if it can find any that aren't occupied.
- Source Data Path This specifies the source of the data used in the parking def. If this data is

not edited the source data path will be the name of apt.dat file used to derive the parking def data. As soon as the data is edited in this window, the source data path with change to the name of the folder and parking def file that was created. You can delete the parking def file if you want to go back to using data from the apt.dat file.

### **Bottom Row**

• Enabled Box - On the bottom row is a box called "Enabled". Uncheck this box to tell World Traffic not to use this parking spot for AI planes. You may want to do this to reserve the spot for yourself or if it is occupied by a static aircraft included with a scenery package. To see what aircraft are currently at a parking spot, you can view any of them from the Display Parking Assignments menu as described in section <u>5.3 Display Parking Assignments</u>.

### Aircraft Selection Criteria

These check boxes allow you to specify whether the operator/type, the aircraft name, or the aircraft tail number is going to be used to find a gate. The tail number is given first priority in that if a parking spot is defined for a specific tail number, when a plane lands or departs, it will first look to see if a parking spot is configured for it specifically. If none is found, it will then look to see if any parking spots are defined for the aircraft name, for example a Lufthansa A-332. Finally, if no parking spot is found, it will look for a parking spot matching the operator/type values, for example a Lufthansa heavy jet. The latter of these three options is by far the most common.

### **Parking Position Adjustment**

If the parking position as defined in the apt.dat file is not quite right, you may adjust the location by about 10 meters by clicking the 4 buttons. It's best to be testing a ground route and having an aircraft displayed when you do this.

Heading - You can change the parking heading.

### **Push-Back Parameters**

- Auto push-back distance checkbox if this box is checked, the push-back will stop if the plane reaches the taxi path before reaching the defined initial push-back distance defined below.
- Initial push-back distance A default is set to 246 feet for any parking spots defined as gates but you can change it here if you wish a different distance.
- Auto set push-back heading to taxi path If this box is checked the values below will be hidden the plane will turn on push-back so that is facing towards the heading of the closest taxi network path.
- Push back turn heading and secondary push-back distance If you wish the aircraft to make a turn during push-back, enter the heading and extra distance in these fields. The heading value is the heading from the end of the initial push back point to where you want the aircraft to end up at the end of the second push-back leg.

### **Parking Center Reference**

The parking position center may be set in reference to aircraft's main door, secondary door, nose wheel, or main wheels. For gates, you will most likely want the position to be in reference to one of the two doors. If the plane only has one passenger door position defined in the aircraft definition file, then that will be used if door2 is selected. For tie-down spots, you will most likely want the parking position to

be the nose-gear position.

### Gate Type

- Regional This is the default value for all gates. This gate will be selected for flights where the arrival and departure airports are in the same country.
- International This gate will be selected for flights where the arrival and departure airports are in different countries.
- Either This gate can be used for either regional or international flights.

If all gates are set to type Regional (default setting), the airport is assumed to not have any international gates and the gate will be used by regional or international flights.

### Aircraft Type And/Or Operator Fields

The following fields are available when the Aircraft Selection Criteria are set to "Aircraft Type And/Or Operator".

- Allowed Aircraft Types Check all of the aircraft types that are allowed to use this parking spot.
- **Operators** Type in a list of ICAO operator names with spaces between the names allowed to use this gate. If this is left blank, any operator is allowed to use the parking spot.
- Parking Spot Allows Civil Aircraft and Parking Spot Allows Military Aircraft check one or both boxes.
- Parking Spot Only for Cargo, Only for Non-Cargo, or Either check one of the boxes as desired.

### Aircraft Name Fields

When the Aircraft Selection Criteria are set to "Aircraft Name". This window is displayed. Select the specific aircraft name from the list.

×	Parking Assignment Edit	×
Airport: CYYC Parking Assignment: Ga	ate_21B	State: Available
Aircraft Selection Criteria Option	Select an Aircraft from this list	
Aircraft Type And/Or Operator	747 AFR 747 ANA	
🗹 🛛 Aircraft Name	747 BA One World	
Aircraft Tail Number	747_Cathay 747_DLH 747_EVA	
Parking Position Adjusment:	747 KLM 747 QFA 747 SIA 747 THA	
Left Right	747 <sup>-</sup> UAL 747 <sup>-</sup> VIR A306 AAW	
Back Heading (degT): 90	A306_AHK A306_CES A306_CSN A306_DHK	
Initial Pushback Distance (ft):	A306 DLH A306 ETD A306 FDX A306 IRA A306 IRA	
Pushback Turn Heading (degT):	A306_JAL A306_KAC A306_KAL A306_KZU A306_LAA	
Secondary Pushback Distance (ft):		
0	Aircraft Selected:	
Select Parking Center Reference:		
▼ Door1		
Door2		
🗖 Nose Wheel		Regenerate Ground Routes
🗖 Main Wheels	👿 Enabled	Test Ground Routes

#### **Aircraft Tail Number Fields**

When the Aircraft Selection Criteria is set to "Aircraft Tail Number". This window is displayed. Type in the name of the aircraft tail number. The aircraft tail number is associated with specific flight plans. See section <u>8 CreatingCustom Routes</u> in the World Traffic manual on flight plans to see how a tail number is entered. This is not a commonly used option.

X Pa	king Assignment Edit 🛛 🗙 🗙
Airport: CYYC Parking Assignment: Gate_21B	State: Available
Aircraft Selection Criteria Option Enter the A	rcraft Tail Number
Aircraft Type And/Or Operator	
Aircraft Name	
🗹 🛛 Aircraft Tail Number	
Parking Position Adjusment:	
Left Right	
Back Heading (degT): 90	
Initial Pushback Distance (ft):	
Pushback Turn Heading (degT):	
Secondary Pushback Distance (ft):	
Select Parking Center Reference:	
Door1	
Door2	Regenerate Ground Routes
Nose Wheel     Main Wheels     Enable	d Test Ground Routes

### 6.2 Testing Taxi Routes

You can test out both dynamic taxi routes and fixed taxi routes if you have created any. To test Dynamic Taxi routes, click the "Test Dynamic Taxi Routes" button and to test fixed routes, click the "Test Fixed Taxi Routes" button. They will both take you to the same menu with a list of taxi routes available for testing. The list will of course be empty if testing fixed taxi routes and none have been generated. Note also that where the Airport Operations file prohibits the use of specific planes on certain runway, no taxi routes for those planes will show up in the list.

Departure Ground Ro	utes	
	Rwy17L AUTOGEN.txt	
	Rwy17R_AUTOGEN.txt	
	Rwy35L_AUTOGEN.txt	10
	Rwy35R_AUTOGEN.txt	
	Rwy 11 AUTOGEN.txt	
Gate 21B Heavy Jet	Rwy_29_AUTOGEN.txt Rwy17L_AUTOGEN.txt	
Gate 21B Large Prop Gate 21B Large Prop	RWY17L AUTOGEN.txt	
Gate 21B Large Prop	Rwy17R_AUTOGEN.txt Rwy35L_AUTOGEN.txt	
	Rwy35R AUTOGEN.txt	
Gate 21B Large Prop	Rwy 08 AUTOGEN.txt	
	Rwy 11 AUTOGEN.txt	
	Rwy 26 AUTOGEN.txt	
	Rwy 29 AUTOGEN.txt	
	Rwy17L AUTOGEN.txt	
	Rwy17R AUTOGEN.txt	
	Rwy35L_AUTOGEN.txt	
	Rwy35R AUTOGEN.txt	
		. ~
	Test Selected Departure Ground Route	
Arrival Ground Route		
Arrival Ground Route: Gate 21B Heavy Rwy17L	s AUTOGEN.txt	
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy17R	s AUTOGEN.txt AUTOGEN.txt	î
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy17R Gate 21B Heavy Rwy35L	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt	Ê
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy17B Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy35B	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt	Ê
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy37R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35P Gate 21B Heavy Rwy 11	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt	Î
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy37R Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy31 Gate 21B Heavy Rwy 29	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt	Ê
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy 29 Gate 21B Heavy Rwy 29 Gate 21B Large Prop	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L_AUTOGEN.txt	
Arrival Ground Route: Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy17R Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy35S Gate 21B Heavy Rwy 11 Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Prop	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17R_AUTOGEN.txt	Î
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy37R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy 29 Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Prop Gate 21B Large Prop	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L AUTOGEN.txt Rwy17L AUTOGEN.txt Rwy17L AUTOGEN.txt Rwy38L_AUTOGEN.txt	Î
Arrival Ground Route: Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy 29 Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Prop Gate 21B Large Prop Gate 21B Large Prop Gate 21B Large Prop	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L AUTOGEN.txt Rwy17R AUTOGEN.txt Rwy17R AUTOGEN.txt Rwy35R AUTOGEN.txt Rwy35R AUTOGEN.txt	
Arrival Ground Route: Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35S Gate 21B Heavy Rwy35S Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Prop	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Wwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17R_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy 08_AUTOGEN.txt	
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy37R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Prop	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy35R_AUTOGEN.txt Rwy 108_AUTOGEN.txt Rwy 11 AUTOGEN.txt Rwy 11 AUTOGEN.txt	Î
Arrival Ground Route: Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy 29 Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Prop	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy38L_AUTOGEN.txt Rwy26_AUTOGEN.txt Rwy 11_AUTOGEN.txt Rwy 26_AUTOGEN.txt	
Arrival Ground Route: Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy35S Gate 21B Heavy Rwy35S Gate 21B Heavy Rwy 21 Gate 21B Large Prop Gate 21B Large Prop	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17R_AUTOGEN.txt Rwy31L_AUTOGEN.txt Rwy26AUTOGEN.txt Rwy26_AUTOGEN.txt Rwy 26_AUTOGEN.txt Rwy 26_AUTOGEN.txt Rwy 26_AUTOGEN.txt Rwy 29_AUTOGEN.txt	
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy17R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy 11 Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Jet	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy08_AUTOGEN.txt Rwy01L_AUTOGEN.txt Rwy026_AUTOGEN.txt Rwy12_AUTOGEN.txt Rwy12_AUTOGEN.txt Rwy12_AUTOGEN.txt Rwy12_AUTOGEN.txt	
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy35R Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Jet	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy 08_AUTOGEN.txt Rwy 11_AUTOGEN.txt Rwy 126_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt	
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Jet Gate 21B Large Jet	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17R_AUTOGEN.txt Rwy17R_AUTOGEN.txt Rwy26A_UTOGEN.txt Rwy208_AUTOGEN.txt Rwy208_AUTOGEN.txt Rwy208_AUTOGEN.txt Rwy208_AUTOGEN.txt Rwy208_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt	
Arrival Ground Route Gate 21B Heavy Rwy17L Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy35L Gate 21B Heavy Rwy 29 Gate 21B Large Prop Gate 21B Large Jet Gate 21B Large Jet	s AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy35L_AUTOGEN.txt Rwy 08_AUTOGEN.txt Rwy 11_AUTOGEN.txt Rwy 126_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt Rwy17L_AUTOGEN.txt	

Select a departure or arrival ground route to test and click the test button. For a departure ground route, an aircraft will be selected randomly matching the selection criteria conditions defined for the ground route and it will be placed at the parking spot and begin taxiing. Push the track camera key that you defined in the section 2.1 Assigning Keys to go to the taxiing aircraft and you should see a scene similar to that below.



If the parking spot requires a push-back the plane will start in this state. You will notice four back and green poles defining the boundaries of the parking location. Small white and blue poles are also placed marking the positions of each waypoint in the routes. These poles are only displayed during testing.



On the bottom left side of the window, it provides aircraft information and also tells which waypoint number the aircraft is heading to next. Speeds are calculated automatically for the ground route, but you can modify them if desired in the file. The primary purpose of the test function though is for developers of the apt.dat files who can test the ground routes and then making changes in WED to the taxi network if they need to. People using other tools to generate ground routes will also find this test function useful.

When texting an arrival ground route, the aircraft will be placed on a short final to the runway and then follow the selected arrival route into parking.

## 6.3 Creating Fixed Taxi/Ground Routes for a Specific Airport

This option will be gone in the next version of WorldTraffic to be replaced with an option to select an alternate apt.dat file with a different taxi network if desired. Again Dynamic Taxi routes should normally be used but if you are wanting to generated fixed routes, from the **X-Plane – Plugins** menu, select the "Generate Ground Routes for Airport" option to bring up this window. Enter the airport ICAO code and the runway name in the box. If the runway name is left blank, taxi routes will be generated for all runways. You can also specify if the routes should be generated for arriving aircraft, departing aircraft or both.



If you want to change the default runway exit distances for Heavy and Large jets, you may set them using sliders.

Heavy and Large jets have quite a wide range of landing distances for the various aircraft in these classifications so WorldTraffic creates three different ground routes for each classification. You can change the default exit distances to tailor the creation to a specific airport as described next. Below is a runway map for KSEA. Looking at runway 34L at the top of the map, you can see that the exits are at 4600 feet, 6200 feet, and 7300 feet. So when creating the arrival ground routes, you would set your sliders to something like 4000, feet, 5500 feet, and 6500 feet. These are the distances at which the ground creator starts looking for exits so you must set the distance to before the exit. With the three different ground routes in place, WorldTraffic will then choose one for arriving aircraft using the aircraft's normal landing distance, minimum landing distance as selection criteria.



When generating ground routes you are given two options:

- Regenerate Ground Routes and Parking Defs using WED Data Only CAUTION this options will regenerate the Parking Defs using data created from WED so don't use this option if you have made changes to your Parking Defs that you want to keep. The ground routes coordinates are created using the taxi network layout as defined in WED.
- **Regenerate Ground Routes but use WT Parking Defs Data** This option will generate the ground routes again using the taxi network as defined in WED but the the data in the Parking Defs such as push-back info, revised operator/aircraft types, etc will be used as well.

# 7 Airport Operations Files

This file is optional. Default data will be used for all fields in this file if the file does not exist. It can be created at any time from the Airport Operations menu as described in the section <u>3.2 Airport</u> <u>Operations</u>. This is useful for airport developers if they want to tune their airport to make operations as realistic as possible. It also replaces X-Plane flows as it allows for far more customization of airport flows. A future WorldTraffic update will allow one to import X-Plane flows to use as a starting point. Sample airport operations file can be found in the

"XPlane\ClassicJetSimUtils\WorldTraffic\AirportOperations" folder. This section will reference the one for Seattle (KSEA).

## 7.1 Runway Operations

Two sections are needed to define the runway operations, the first containing wind vectors and operational times for each unique operation. The second section contains a list of runways that are active for the specific operations. If theses sections are not created, runways will be set active by simply looking at x-plane winds so that planes take off into the wind. For large airports though, runway operations are more complex.

# 7.1.1 OPERATIONS

This first section defines the unique operation based on wind speed/direction and time of day. For KSEA, there are 9 unique operations

INDEX	Low Wind Speed	High Wind Speed	Low Wind Dir	High Wind Dir	Start Time	End Time	Comments
START (	PERATIONS						
0 -	0	10	0	360	17:00	04:00	Calm Morning
1	0	10	0	360	04:00	09:00	Calm Rush Hour
2	0	10	0	360	09:00	17:00	Calm Evening
3	10	1000	90	270	17:00	04:00	Southern Winds Morning
4	10	1000	90	270	04:00	09:00	Southern Winds Rush Hour
5	10	1000	90	270	09:00	17:00	Southern Winds Evening
6	10	1000	270	90	17:00	01:00	Northern Winds Morning
7	10	1000	270	90	04:00	09:00	Northern Winds Rush Hour
8	10	1000	270	90	09:00	17:00	Northern Winds Evening
END OPH	RATIONS						

The "INDEX" field must be unique starting from zero. **Times are entered as GMT or Zulu time**. In this example, operation "0" (Calm Morning) is in effect when the wind is from 0 to 10 knots in any direction from midnight until 11:00am. When Operation 0 is in effect, the 16 runways will be used as described in the next section

Operation "6" (Northern Winds Morning) is in effect when the wind is above 10 knots on a heading of 270 degrees to 90 degrees with the wind direction moving clockwise. When Operation 6 is in effect, the 34 runways will be used as described in the next section

# 7.1.2 RUNWAY\_OPS

This section specifies which runways are in use for takeoff and arrival for each unique operation defined above.

Ops Index	Active Runway	Arr Dep	Start End Time Time Comments (not parsed)
	RUNWAY OPS		
0	16L	2	17:00 04:00
0	16C		17:00 04:00
0 0	16R	1	00:00 04:00
1	16L		00:00 24:00
1	16C	1	00:00 24:00
1	16C		00:00 24:00
1	16R		00:00 24:00
2	16L		00:00 24:00
2	16L	2	00:00 24:00
2	16C	1	00:00 24:00
2	16R	1	00:00 24:00
3	16L	2	17:00 04:00
3	16C	1	17:00 04:00
3	16R	1	00:00 04:00
4	16L	2	00:00 24:00
4	16C	1	00:00 24:00
4	16C	2	00:00 24:00
4	16R	1	00:00 24:00
5	34R	1	00:00 24:00
5	34R	2	00:00 24:00
5	34C	1	00:00 24:00
5	34L	1	00:00 24:00
6	34R	2	17:00 04:00
6	34C		17:00 04:00
6	34L		00:00 04:00
7	34R	2	00:00 24:00
7	34C	1	00:00 24:00
7	34C	2	00:00 24:00
7	34L	1	00:00 24:00
8	34R	1	00:00 24:00
8	34R	2	00:00 24:00
8	34C	1	00:00 24:00
8	34L	1	00:00 24:00

END\_RUNWAY\_OPS

The "Ops Index" field corresponds to the "INDEX" field in the OPERATIONS section above. Times are entered as GMT. For Operation "0" (Calm Morning), runway 16L is active only for departure and runways 16C and 16R are available for only for arrival. This section also lets you narrow down operating times even further. In this case runway 16R is only open for arrival between 00:00 and 04:00 Zulu time or between 7:00 am and 11:00 am. Before 7:00 am it will be closed since there is not much arriving traffic and this runway is furthest from the terminal.

## 7.2 Aircraft Operations

The following sections allow the user to define what aircraft can operate on each runway, what approaches are allowed and what the separation buffers are between aircraft during takeoff and landing.

# 7.2.1 Runway Configuration

This section lets you specify runway data such as allowed aircraft, approach information and circuit information.

Runway Allowe	Supported AC Types 7 0 1 2 3 4 5 6 7 8 9 ed	Supported Approaches 1 2 3 4 5 6 7 8	Final Approach Angle	Final Approach Distance Nm	Arrival Priority	Pattern Direction	Touch-and-Gos Allowed	Standard Circuits
START	RUNWAY							
16L <sup>-</sup>	- 111100000	1 1 1 1 1 1 1 0	3.0	5.0	0	CCW	0	1
34R	1 1 D D D D D D 0	1 1 1 1 1 1 1 0	3.0	5.0	0	CCW	0	1
16C	1 0 1 1 1 1 1 1 1 0	1 1 1 1 1 1 1 0	3.0	5.0	1	CW	0	1
34C	1 0 1 1 1 1 1 1 1 0	1 1 1 1 1 1 1 0	3.0	5.0	1	CCW	0	1
16R	1 1 1 1 1 1 1 1 1 0	1 1 1 1 1 1 1 0	3.0	5.0	1	CW	0	1
34L	1 0 А А А А А А О	1 1 1 1 1 1 1 0	3.0	5.0	1	CW	0	1
END_RU	JNWAYS							

### Supported AC Types

For supported aircraft types, put a 1 in the column to indicate that the aircraft type is allowed on the runway or 0 if not. Put a A after in the column to indicate that the runway can only be used for arrivals only for that aircraft type. Put a D in the column to indicate that the runway can only be used for departures for that aircraft type. For KSEA, runway 34R/16L is limited for arrivals to only a few aircraft types since that runway is primarily used for departures.

Type ID	Type Description	Sample Aircraft for this Type			
0	Fighter	Less than 100,000 lbs AND thrust:weight ratio greater than 0.5 - eg. F-35, SU-27, must have an afterburner			
1	Super-Heavy Jet	> 1,000,000 lbs - A-380, AN-225			
2	Heavy Jet	> 255,000 lbs - eg. A-340, A-330, 747, 787, 777, 767			
3	Large Jet	> 41,000 lbs - eg. A-318 - A-321, 757, 737			
4	Large Prop	> 41,000 lbs - eg. C-130, A-400, Dash-8-400			
5	Medium Jet	> 19,000 lbs - eg. CRJs, ERJs or large business jets like Gulfstream and Global Express			
6	Medium Prop	> 19,000 lbs - eg. Dash-8s, ATRs			
7	Light Jet	< 19,000 lbs - eg. small business jets, jet trainers			
8	Light Prop	< 19,000 lbs - eg. Cessnas, Pipers, Lancairs, King Airs, Metroliners			
9	Helicopter	All helicopters			

Table 1- Aircraft Types

### Supported Approaches

For supported Approaches enter a 1 in the column under the approach type. All runways allow visual approaches. Specific minimum numbers for approaches can be entered further down in the Airport Operations file in the Approaches section. Approach types are shown in the table below:

Approach ID	Approach Name	Approach Description and General minimums
0	Visual	DH = 3000', vis $- 3Nm$ (all runway support these)
1	Non Precision VOR, NDB, TACAN, etc.	DH = 200'-500', RVR = 0.5 – 1.25 Nm
2	ILS/DME	DH = 200', $RVR = 0.5 - 1.0 Nm$
3	RNAV (GPS or RNP)	DH = 200', RVR – 2400' to 4000'
4	ILS CAT I	DH = 200', RVR – 1200' to 2400'
5	ILS CATII	DH = 100', RVR – 1200'
6	ILS CAT IIIa	DH = 0', RVR - 600'
7	ILS CAT IIIb	DH = 0', RVR – 150'
8	ILS CAT IIIc	DH = 0', RVR - 0' - not currently used anywhere

Table 2- Approach Types

### Final Approach Angle & Distance

Final Approach Angle and Final Approach Distance fields are only used for airports that have no Navigraph data for the runways. Otherwise, they can normally be left blank or set to - 1 so that the default values are used. You can set these for airports where the final approach requires a steeper descent angles in case there is terrain blocking the runway for example. The valid values for Final Approach Angle are between 2 and 10 degrees. The valid values for Final Approach Distance are between 1 and 5 nautical miles. These values are overridden by values in the Navigraph approaches so will only be used for airports without them.

### <u>Arrival Priority</u>

If not defined, the arrival priority will be the same for all runways. There are two options:

- 0 higher priority
- 1 lower priority

For KSEA, a lower priority is assigned to runway 34R and 16L since it is used for both takeoff and landing whereas the other 2 runways are used for landing only so they are the preferred runways for landing aircraft. The lower priority runway will only be used if the high-priority runways are busy.

### Pattern Direction

Pattern direction is used mostly by GA planes or when the airport has no defined Navigraph approaches. It defaults to CCW except for runways with a 'R - Right' designation in which case it defaults to CW.

### Standard Circuits Allowed

The Standard Circuits allowed field means that traffic patterns used commonly at airfields with lots of GA traffic are allowed for GA aircraft flying VFR. This will default to true (1) for airports unless a large airport is nearby in which case it is set to false to minimize traffic conflicts with planes at the nearby airport and GA planes will have to follow the published approaches.

# 7.3 General Airport Settings

## 7.3.1 Miscellaneous Settings

Some airport developers use tie-downs in WED to indicate that planes shouldn't use push-backs at these parking spots. Other users use tie-downs in WED to indicate that a plane is not parked at a gate. Set this field to 0 if push-backs won't be automatically done at tie-down spots. Set this field to 1 if push-backs should be done at tie-down spots.

Set DynamicTaxiRoutesOnly to 1 to use Dynamic Taxi routes only. This is normally set to 1 except for airports with custom taxi routes where those routes differ from the dynamic routes. This would be set to 0 by airport authors to force WT to use any custom taxi routes. They load slower so best to use dynamic routes when possible. Note that custom taxi routes are soon obsolete to replaced with an option to specify an alternate apt.dat file with an alternate taxi network for specified parking spots if the dynamically generated route is not as desired.

```
START_MISC_SETTINGS
TieDownsRequirePushBacks 0
DynamicTaxiRoutesOnly 1
UseRealFlights 1 (currently not used)
END_MISC_SETTINGS
```

### 7.3.2 Landing Time Buffers

The landing time buffers are used to override the time allowances required for landing aircraft. The landing time buffer specifies how much time a plane needs after landing to get off the runway. This value can be big if an aircraft needs to backtrack down the runway to exit for runways which have only an exit in the middle of the runway for example. For KSEA below, all landing time buffers are set to 110 seconds which is the default setting. If for example super-heavies and heavies (AC Types 1 and 2) required that that the plane had to back-track because they used up a lot of runway on landing and required an extra minute to turn around and get off the runway, the landing times for those types would be increased to 170 seconds.

		AC	Types	(Lan	ding)								
Runway	0	1	2	3	4	5	6	7	8				
START_TIME_BUFFERS													
16L –	110	110	110	110	110	110	110	110	110				
34R	110	110	110	110	110	110	110	110	110				
16C	110	110	110	110	110	110	110	110	110				
34C	110	110	110	110	110	110	110	110	110				
16R	110	110	110	110	110	110	110	110	110				
34L	110	110	110	110	110	110	110	110	110				
END_TIME_B	UFFER	S											

### 7.3.3 Takeoff Separation Time Buffers

The takeoff separation matrix defined below specifies required separation times between leading and following aircraft. FAA data is used to define these values but they can be changed to meet other standards such as RECAT-EU.

Leader		Fol	lower	AC T	ypes	(Taki	ng Of	f)					
AC Type	0	1	2	3	4	5	6	7	8				
START_TAKEOFF_TIME_BUFFERS													
0	0	0	0	0	0	0	0	90	90				
1	180	0	120	180	180	180	180	180	180				
2	120	0	0	120	120	120	120	120	180				
3	120	0	0	0	0	0	0	120	120				
4	120	0	0	0	0	0	0	120	120				
5	100	0	0	0	0	0	0	100	100				
6	100	0	0	0	0	0	0	100	100				
7	0	0	0	0	0	0	0	60	60				
8	0	0	0	0	0	0	0	60	60				
END TAKEOF	F TIME	BUF	FERS										

### 7.3.4 Required Takeoff Times

This table defines how long specific aircraft need on the runways to takeoff. Most of the time 90 seconds is sufficient but more time may be required if back-tracking on a runway is required. This data is used to determine if a plane can taxi out onto a runway for takeoff taking into account the position of planes on final if any.

AC Types (Takeoff Times)												
Runway	0	1	2	3	4	5	6	7	8			
START_TIME_REQUIRED_FOR_TAKEOFF												
16L	60	90	90	90	90	90	90	70	60			
34R	45	60	60	60	60	60	60	50	45			
16C	45	60	60	60	60	60	60	50	45			
34C	45	60	60	60	60	60	60	50	45			
16R	45	60	60	60	60	60	60	50	45			
34L	45	60	60	60	60	60	60	50	45			
END_TIME_R	EQUIRE	D_FOF	R_TAKE	EOFF								

### 7.4 General Aviation Traffic Settings

This table is generated with default values with number of flights per day being set to variable number of flights per day per parking spot. If there are no parking spots for specific aircraft types, no flights will be generated. If there are lots of parking spots for GA aircraft, lots of GA flights will be generated. A parking spot is designated as being for GA aircraft if it has an operator of NONE set for it in the Parking Definition editor which is based on data created in WED and saved in the apt.dat files. You can also enter the percentage of flights that are out and back vs one way. General Aviation flights for light props are often training or sight-seeing flights so most of these by default are set as out and back flights. There can be other type of GA traffic such as for corporate aircraft like light jets for Lear jets (type 7) or bigger business jets like the Global Express (Type 5).

Aircraft Type	Flights Per Day	Percent Out-and-Back
START GA TRAFFI		
0	0	0
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	4	0
8	6	90
9	0	0
END_GA_TRAFFIC		

# 7.5 Airspace Dimensions

Enter the airspace dimensions in this section. Defaults are determined automatically if none are defined.



The following diagram shows typical airspace dimensions and is used to setup default values.



### 7.6 VFR Airspace Exit Points

For higher-traffic airspace areas, VFR traffic is often vectored by World Traffic ATC out of the airspace to known landmarks. These can be defined in this section. Set the altitude to which planes should be over the point. Set as -1 to have WorldTraffic pick the elevation. The name can consist of several words, eg. 'the twin stacks'

```
Lat Lon Altitude (ft) Name

START_VFR_EXIT_POINTS

47.3877 -122.3754 -1 Point Robinson

47.5297 -122.3964 2000 Lincoln Park

47.5290 -122.2353 2500 Mercer Island

END VFR EXIT POINTS
```

# 7.7 Bridges

This would be used by airport developers. In this section specify any bridges that aircraft taxi over for scenery areas like EDDM where aircraft taxi over a road so that they don't drop onto the ground when bridges are not defined correctly. Define the start and end coordinates and the aircraft will stay at its current elevation when taxiing between these points.

# 7.8 Navigraph SID/STAR/Approach Settings

### STAR Settings

You can enable or disable specific SIDs, STARs, or Approaches here or set their hours of operation. Set the Enabled field to 0 to disable a specific route or set it to 1 to enable it. Enabled is the default. The most common reason to disable a STAR is if you don't want traffic approaching from one direction to use a specific runway. For example if an airport has two parallel runways facing north/south and there is a STAR that has aircraft approaching from the east and it goes to both runway but you only want traffic from the east to use the right-most runway, you could disable the STAR going to the left-most runway.

For STARs you can also set the holding pattern direction to CW(0) - default or CCW(1). If the settings should be set to the default settings, you don't need to enter it below.

For STARs you can also set the exit waypoint using 0 as the first waypoint. For some STARs defined for all runways like FUZZY8 at KLAS, aircraft only use a subset of the defined waypoints depending on what runway they are landing on. A reasonable default is calculated and it usually the last STAR waypoint or blank for STARs that are for a specific runway, but can be changed here.

STAR Name	Enabled	Start Time	End Time	Holding Pattern Direction	Runway	Exit Wpt
START STAR SETTINGS						
CHINS4.16L	1	00:00	00:00	CCW	16L	3
CHINS4.16R	1	00:00	00:00	CCW	16R	3
CHINS4.16C	1	00:00	00:00	CCW	16C	3
CHINS4.34L	1	00:00	00:00	CCW	34L	3
CHINS4.34R	1	00:00	00:00	CCW	34R	3
CHINS4.34C	1	00:00	00:00	CCW	34C	3
EPH8.16L	1	00:00	00:00	CCW	16L	3
EPH8.16R	1	00:00	00:00	CCW	16R	3
EPH8.16C	1	00:00	00:00	CCW	16C	3
EPH8.34L	1	00:00	00:00	CCW	34L	3
EPH8.34R	1	00:00	00:00	CCW	34R	3
EPH8.34C	1	00:00	00:00	CCW	34C	3
GLASR1.16L	1	00:00	00:00	CCW	16L	3
GLASR1.16R	1	00:00	00:00	CCW	16R	3
GLASR1.16C	1	00:00	00:00	CCW	16C	3
GLASR1.34L	1	00:00	00:00	CCW	34L	3
GLASR1.34R	1	00:00	00:00	CCW	34R	3
GLASR1.34C	1	00:00	00:00	CCW	34C	3
HAWKZ7.16L	1	00:00	00:00	CCW	16L	7
HAWKZ7.16R	1	00:00	00:00	CCW	16R	7
HAWKZ7.16C	1	00:00	00:00	CCW	16C	7
HAWKZ7.34L	1	00:00	00:00	CCW	34L	
HAWKZ7.34R	1	00:00	00:00	CCW	34R	
HAWKZ7.34C	1	00:00	00:00	CCW	34C	
JAWBN6.16C	1	00:00	00:00	CCW	16C	2
JAWBN6.16L	1	00:00	00:00	CCW	16L	2
JAWBN6.16R	1	00:00	00:00	CCW	16R	2
JAWBN6.34C	1	00:00	00:00	CCW	34C	2
JAWBN6.34L	1	00:00	00:00	CCW	34L	2
JAWBN6.34R	1	00:00	00:00	CCW	34R	2
MARNR7.16L	1	00:00	00:00	CCW	16L	
MARNR7.16R	1	00:00	00:00	CCW	16R	
MARNR7.16C	1	00:00	00:00	CCW	16C	
MARNR7.34L	1	00:00	00:00	CCW	34L	6

MARNR7.34R	1	00:00	00:00	CCW	34R	6
MARNR7.34C	1	00:00	00:00	CCW	34C	6
OLM2.16L	1	00:00	00:00	CCW	16L	3
OLM2.16R	1	00:00	00:00	CCW	16R	3
OLM2.16C	1	00:00	00:00	CCW	16C	3
OLM2.34L	1	00:00	00:00	CCW	34L	3
OLM2.34R	1	00:00	00:00	CCW	34R	3
OLM2.34C	1	00:00	00:00	CCW	34C	3
END STAR SETTINGS						

To determine they waypoint numbers in the Navigraph data, I use this web site to view the Navigraph xml files: <u>xmlgird</u>

Open KSEA.xml in the "XPlane\ClassicJetSimUtils\NavigraphData" folder. You will see a window as follows. Click the arrows to expand the various sections. Click this <u>link</u> to see the full size image as the image below may be too small to see.

Xml	Gri	d.net			XmlEditor XmlToExce	XmiToTe: I JsonToXi			(sdToXml Excel Viewer													
ML Editor																						
provided by Navigra	ph - www.	navigraph.com	Data copyright (c	) 2020 Jeppesen Th	nis data may be	used for ground bas	ed recreational c	omputer game s	mulation softwa	ire only, and my no	t be recon	npiled, interpre	ed, or distribute	d for any pu	rpose without	the written consent of	f Navigraph. The contents of	this database	is dated and must not be	used for re-	al world navigati	tion r
ProceduresDB																						
@ xmlns		http://tempu	ri.org/XMLSche	ma.xsd																		
@xmlns:xsi		http://www.v	v3.org/2001/XN	4LSchema+instanc	e																	
@version		AIRAC 2011	Rev.1 by Navigr	aph/Navdata																		
@ build		09/30/2020	19:43 UTC																			
@xsi:schemaLo	cation	http://tempu	ri.ora/XMLSche	ma.xsd FMC.xsd	-																	
<ul> <li>▼Airport</li> </ul>																						-
<ul> <li>Allport</li> </ul>																						-
@ ICAOcod	e KSE/	-																				
Sid (42)																						-
► ▼ Custom	Departure																					-
<ul> <li>Star (42)</li> </ul>																						-
@ Na		<b>O</b> D	@ JetsOnly	@ PropsOnly	O Fachlad	@ StartTime	O Facilities a	@ Commen	The second second	Inconst												_
	34.16L		false	false	true	00:00	00:00	Commen		Vaypoint (5)												_
China	54.10L	IUL	laise	laise	a ue	00.00	00.00		_		- 7	-1		-	-	▼ AltitudeCons	▼ AltitudeRestriction				- n - Lt	1.1
									<b>Q</b>	ID Vame CHINS		46.811506	+120.952158	• v Speed	▼ Attitude	AttitudeCons	* AltitudeRestriction	▼ Hag_Crs	whog_crs_value			nit
										RADDY		46.811506	-120.952158	0	0	0	at			Fly-by	25	_
•									▼ 2					0	· ·	v	at			Fly-by		_
									▼ 3	HUMPP		47.209375	-121.810125	0	15000	0	below			Fly-by	25	_
									▼ 4	AUBRN		47.361789	-122.145983	250	12000	0	at			Fly-by	25	_
									▼ 5	(VECTORS)	Vectors	0.000000	0.000000	0	0	0	at	1	343	Fly-by	25	
T CHIN:	54.16R	16R	false	false	true	00:00	00:00		Star_W	/aypoint (5)												
T CHIN	\$4.16C	16C	false	false	true	00:00	00:00		Star_W	/aypoint (5)												
T CHIM	34.34L	34L	false	false	true	00:00	00:00		Star_W	(avpoint (5)												

In the above example, the STAR CHINS4.16L is open. It has 5 defined waypoints. In the Navigraph table above, you'll see that the exit waypoint has been defaulted to waypoint 3 or ID 4 on xmlgrid since WT starts at 0 for the first waypoint. The last waypoint is a vector so is ignored and WT will either send the plane to the approach here, or put the plane in a holding pattern on extend the flight path on the vector heading. In any case, this is a setting that seldom needs to be changed.

### Approach Settings

For the approach type use the number shown above for Aircraft Navigation Systems. The default ILS approach type is set to 2 (ILS/DME) since the Navigraph data doesn't specify the specific ILS type. You can set it to be a higher precision ILS approach such as CAT IIIa (6) for example by modifying the approach type value below.

Approach minimums can be found from airport approach plates. These values are used to determine when inbound AI planes should divert to alternate airports. If the weather is marginal a small percentage of planes will attempt the approach and will divert if required at the missed approach point.

	Star	t End	Decisi	on	Approach	
Approach Name	Enabled	Time	Time	Height (ft)	Min Vis (Nm)	Туре
START APPROACH SETTINGS						
ILS16C	1	00:00	00:00	200	0.5	2
ILS16L	1	00:00	00:00	200	0.5	2
ILS16R	1	00:00	00:00	200	0.5	2
ILS34C	1	00:00	00:00	200	0.5	2
ILS34L	1	00:00	00:00	200	0.5	2
ILS34R	1	00:00	00:00	200	0.5	2
RNVY16C	1	00:00	00:00	500	0.5	3
RNVZ16C	1	00:00	00:00	500	0.5	3
RNVY16L	1	00:00	00:00	500	0.5	3
RNVZ16L	1	00:00	00:00	500	0.5	3
RNVY16R	1	00:00	00:00	500	0.5	3
RNVZ16R	1	00:00	00:00	500	0.5	3
RNVY34C	1	00:00	00:00	500	0.5	3
RNVZ34C	1	00:00	00:00	500	0.5	3
RNVY34L	1	00:00	00:00	500	0.5	3
RNVZ34L	1	00:00	00:00	500	0.5	3
RNVY34R	1	00:00	00:00	500	0.5	3
RNVZ34R	1	00:00	00:00	500	0.5	3
END_APPROACH_SETTINGS						

### <u>SID Settings</u>

For SIDs, the only fields to modify are the enabled (1)/disabled (0) field and hours of operation (Zulu/GMT time).

# 8 CreatingCustom Routes

Besides using scheduled airline/cargo flights and random GA flights, the user can also create their own flights and specific VFR arrival routes since no Navigraph data is available for these. As well, you can create custom routes for any scheduled flight to follow or any of the randomly-generated flights if you want airliners to fly a specific flight path instead of a direct one or if you want GA planes to follow a sight-seeing or training path instead of a randomly-generated path.

# 8.1 Custom Routes

Entire custom flights can be created for any existing World Traffic aircraft (or boat or vehicle) if you want to expand on the scheduled or GA/military random traffic. A flight plan file can be created in one of two formats and these files get placed in one of the user-defined region folders as described in section <u>5.6 Enable/Disable Regions</u>. Sample files are included for KSEA in the "XPlane\ClassicJetSimUtils\WorldTraffic\RouteFiles\KSEA" folder which this section will describe.

# 8.1.1 Tabular Route File Format

All of the scheduled flights that come with WorldTraffic are in the tabular file format. The are located in the folder "X-Plane\ClassicJetSimUtils\WorldTraffic\RouteFiles\AFRE\_Real\_Traffic". The user may create their own files using this format as well. The Aircraft ID along with the airport names and times are used to decide where to put the specific aircraft when flights are created, in flight between 2 airports or at one of the arrival or departure airports. In the example below the aircraft object, "B763\_ABX" is associated with the tail number N219CY. Three rows are shown for 3 days, Sunday (0), Monday (1), and Tuesday (2). If it's currently Monday at 22:00 and flights are created, the plane would be parked at EHAM ready to depart for EDDP at 22:10. If flights were created at 22:30, then the plane would be placed in flight about 20 minutes away from EHAM heading to EDDP.

Looking at the 2<sup>nd</sup> row, a direct route will be generated for the aircraft between the last waypoint of the SID for EHAM and the first STAR waypoint for EDDP. The aircraft's altitude and cruising speed will be generated cruise mach and ceiling, to come up with appropriate numbers for the distance and heading being flown.

Here's a few sample rows from the ABXair tabular flight plan file:

```
DEP ARR DEP
OP APT APT AC TIME FLTNO AC ID
==ABXAir_Wi14-15==
START_TABULAR
ABX,EDDP,EHAM,B763_ABX,2005,GB6342,N219CY,0
ABX,EHAM,EDDP,B763_ABX,2210,GB1239,N219CY,1
ABX,EDDP,EHAM,B763_ABX,0215,GB6342,N219CY,2
END_TABULAR
```

Fields in order between the START\_TABULAR and END\_TABULAR keywords are as follows:

- ICAO Operator Three character operator ICAO code as defined for the aircraft in the aircraft definition files found here: "XPlane\ClassicJetSimUtils\WorldTraffic\AircraftTypes"
- Departure Airport ICAO Code

- Arrival Airport ICAO Code
- Aircraft This can either be an aircraft ICAO name like B773 or an actual aircraft file name like B773\_UAL as found in the AircraftTypes folder. If the using the ICAO name, WT will randomly pick a B773 for the specified ICAO operator. If it specifies a file name, it will use that.
- Departure time enter in GMT/Zulu time format HHMM
- Flight Number whatever the flight should be referenced as on the radar, ie UAL1233.
- Aircraft ID the aircraft tail number if known, can be anything though and is used to track a plane as it flies from airport to airport.
- **Day of week** 0-6 where Sunday is day 0. Leave blank if flight is for any day.

### 8.1.2 Non-Tabular Route File Format

Note that the flight definition commands as described below can be defined in any order in the file. Several commands are optional. Optional parameters are in italics.

### A) Start Time

Specify the start time as follows:

#### STARTTIME HH:MM *TimeIntervalHours* ENDTIME

Where the time is in entered in Zulu time. Set this value to -1 if you wish the flight to start immediately as soon as the plugin starts. If the optional time interval is set and the time is not set to -1, flight plans will be cloned using the start time and adding the time interval to generate flights for a day. If the time interval is 1.0 hours, for example, 23 flights will be generated for the day at 1 hour intervals. The minimum value for the time interval is 0.25 hours (15 minutes) and the maximum value is 23.75 hours.

### **B)** Start Days (optional)

Specify the days of the week that this flight plan is active. If this section is not defined, the flight plan will be valid for all days of the week. Specify the active days as follows:

#### STARTDAYS D1 D2 D3 etc. ENDDAYS

Where the days are 0 to 6 with 0 being Sunday. One or more days can be entered in this section.

### C) Aircraft Types and Tail Numbers

Aircraft names can be defined in this section with a maximum of 4 allowed if the flight plan is for a formation flight. Aircraft need not be the same, but they must have overlapping speed ranges between max takeoff flap speed and cruise speed so they can fly together.

Tail numbers can be defined for the aircraft if you want to have several flight plans define an aircraft's

travel path from one airport to another. For example, if you have three flight plans defined all for one aircraft tail number for different times of the day, the application will determine on startup where the aircraft should be and only draw it in one location, parked at an airport on en-route. If no tail number is defined for an aircraft in a flight plan, on startup the application will place aircraft at the destination airport if the plane is not determined to be en-route. Aircraft names and tail numbers are defined as follows:

```
STARTAIRCRAFT
AircraftName1 TailNumber1
AircraftName2 TailNumber2
AircraftName3 TailNumber3
AircraftName4 TailNumber4
ENDAIRCRAFT
```

Where AircraftNameN is the name of one of the available aircraft in the AircraftTypes folder and where TailNumber is an optional tail number of the aircraft. Enter up to 4 aircraft if you want a formation flight.

### D) Callsign (optional)

The callsign entered in the flight plan will be used on the radar display. It is recommended for airliner flights that this be set to the flight number for the aircraft, eg. UAL1022 for United Airlines flight 1022. For civilian aircraft, it can be set to the aircraft's tail number and for a military flight, they often have cool names like Hammer or Viper or whatever you think sounds typical. If no callsign is set here, the callsign will be derived using the operator ICAO code and the flight plan range as defined in the aircraft definition file.

STARTCALLSIGN callsign ENDCALLSIGN

### E) Departure Airport (optional)

The departure airport is defined as shown below:

STARTDEPAIRPORT AirportId ENDDEPAIRPORT

Where AirportId is the 4 letter ICAO airport identifier as defined in the X-Plane airport database. If the departure airport is defined, the plane will take off from this airport if it can find a suitable departure ground route file. If the departure airport is not defined, the plane will start in flight at the position defined in the first steerpoint.

### F) Arrival Airport

The arrival airport is defined as shown below:

STARTDESTAIRPORT AirportId ENDDESTAIRPORT

Where AirportId is the 4 letter ICAO airport identifier as defined in the X-Plane airport database. If the arrival airport is defined, the plane will attempt to land at this airport if it can find a suitable runway. If

no suitable runway is found, in the case where it is in use by another plane, or if the airport does not have a runway long enough, the plane will enter a holding pattern. Once the plane has landed, it will try and find a suitable ground route to a parking spot. If none are available or not defined, the plane will disappear once it comes to a stop.

### G) Alternate Airport

The alternate airport is defined as shown below:

STARTALTERNATEAIRPORT AirportId ENDALTERNATEAIRPORT

Where AirportId is the 4 letter ICAO airport identifier as defined in the X-Plane airport database. If the weather is below minimums for the aircraft or the airport does not have an active runway long enough, the aircraft will divert to the alternate airport. If one is not defined, the aircraft will return to its origin. Weather minimums are dependent upon the navigation installed in the aircraft and the runway nav equipment supported as defined in the airport operations file. If the airport operations file is not defined a runway defaults to supporting all aircraft navigation equipment.

### H) Departure Type (optional)

The departure type can be defined as follows:

#### STARTDEPARTTYPE DepartureType ENDDEPARTTYPE

Where DepartureType can be one of the following:

- 1 Normal Departure (default)
- 2 Vertical Departure (used if the aircraft in the plan has a sufficient thrust to weight ratio to perform a vertical departure)

### I) Arrival Type (optional)

The arrival type can be defined as follows:

STARTARRIVETYPE ArrivalType ENDARRIVETYPE

Where ArrivalType can be one of the following:

- 1 Straight-in Approach (default)
- 2 Overhead Break (planes fly 1500 feet over the runway and break from formation one at a time to circle in to land. This is frequently used for military aircraft arrivals for fighters and even large planes.
- 3 Low Approach (not yet implemented planes will fly low over the runway and break from formation one at a time and pitch up and circle in to land).

### J) Flight Type (optional)

The Flight Type is defined as shown below:

#### STARTFLIGHTTYPE FlightType ENDFLIGHTTYPE

Where FlightType can be one of the follow:

- 1 Civilian Flight (default)
- 2 Military Tactical Flight (planes turn off lights when en-route)

### K) Fly To Completion

Normally for a one-way flight, the aircraft will start searching for a STAR approach within 50 to 100 Nm of the destination airport. If you want the aircraft to follow its route to completion before looking for a STAR, set this field to 1.

```
START_FLY_TO_COMPLETION
FlyType
END FLY TO COMPLETION
```

Where FlyType can be one of the follow:

- 0 Don't fly to completion... use a STAR as soon as it's available
- 1 Fly route to completion... only look for a STAR on the route's last leg.

### L) Landing Light Altitude

For aircraft with landing lights on the wings, these are often turned on when flying below 10,000 feet. You can specify this altitude in feet.

START\_LANDING\_LIGHT\_ALT Altitude END\_LANDING\_LIGHT\_ALT

### M) Steerpoints (optional)

If steerpoints are not defined, they will be calculated using the aircraft's cruising speed and altitude following a direct heading between the departure and arrival airports. Define the steerpoints as follows:

```
STARTSTEERPOINTS lat lon alt alt_type speed max_bank_angle heading unused formation_type description ENDSTEERPOINTS
```

Where the fields in order are:

- latitude decimal degrees
- longitude decimal degrees
- altitude feet
- altitude type ASL or AGL (use AGL for terrain following flights)
- speed speed in knots indicated airspeed OR Mach if value preceded by an M, eg M0.82.
- max bank angle degrees

- heading unused
- unused field
- formation type which can be one of:
  - 0 -ECHELON
  - 1 FINGERTIP (not yet implemented)
  - 2 BATTLE\_SPREAD (not yet implemented)
  - 3 FLUID\_2 (not yet implemented)
  - 4 FLUID\_4 (not yet implemented)
  - 5 TRAIL (not yet implemented)
  - 6 ROUTE (not yet implemented)
  - 7 BOX (not yet implemented)
- description whatever you want to add here to identify the waypoint.

### 8.2 Custom Routes for Scheduled and Randomly-generated flights

Unlike the complete flights as described in the previous section, the user can create custom routes that can be used for scheduled or random flights to follow. For example if you don't want a scheduled airline flight from KSEA to KLAX to follow a direct route, you can provide your own path for these flights to follow. These files are found in the "XPlane\ClassicJetSimUtils\WorldTraffic\FlightPlans" folder with sub-folder names corresponding to airport ICAO names. So the sample flights included for KSEA and KBFI can be found in the "XPlane\ClassicJetSimUtils\WorldTraffic\FlightPlans\KSEA" and "XPlane\ClassicJetSimUtils\WorldTraffic\FlightPlans\KBFI" folders respectively.

The File Name format is as follows:

• DepartureAirportICAO\_ArrivalAirportICAO\_XXXXXX.txt

Example file names would be KSEA\_KSLC\_1.txt, KSEA\_KSLC\_fleem.txt, as long as the arrival and departure airport ICAO names are specified first in the file separated by underscores.

If this file exist, the waypoints defined below will be used instead of being automatically-generated by WT. This is useful if you want airliners to follow specific airways or if you want random GA/Military traffic to follow specific flight paths. If more than one file exists for a route, one will be selected randomly.

In the KSEA folder are 2 files which specify a route between KSEA and KSLC for airliners to follow. If there are more than 1 file between 2 locations, the file will be selected randomly.

In the KBFI folder there few files which specify out-and-back routes where the arrival airport name is the same as the departure airport name. These routes are sight-seeing flights that take GA planes on various routes around Mt. Ranier and out to an island.

### File Format

The following line specifies the aircraft types that can follow this route. This list of aircraft types is identified in <u>Table 1- Aircraft Types</u>

### Aircraft Type/s

Aircraft Type acType1 acType2 acType3 ...

eg. AircraftType 01234567

This would specify that this route can be used by all aircraft types besides light prop planes.

### **Civil / Military Flight**

Civil [0/1]

#### eg. Civil 1

This would specify that this is for civil (non-military) flights.

#### Waypoints

lat lon speed altitude steerpoint\_name

- lat/lon coordinate For flight plans used for airliner traffic the first waypoint should be beyond the ending SID waypoint so that planes don't back track after completing the SID. Similarly, the last waypoint should end well before the first STAR waypoint.
- speed can be in kias or Mach number or -1 for auto-set which is recommended if the route is to be several different aircraft types.
- altitude\_ft\_asl can be feet in ft asl or -1 for auto-set which is recommended if the route is to be several different aircraft types.
- steerpoint\_name used for display in the aircraft track camera view

Here are some example fields:

46.3450	-120.3316	300	32000	KYKM
45.4246	-118.5728	M0.84	36000	KPDT
43.3455	-116.1333	-1	36000	KBOI
42.2943	-114.2950	-1	-1	KTWF

The first line specifies the lat/lon coordinates, that the plane should fly at 300 kias, and at 32,000 ft. The  $2^{nd}$  line specifies the lat/lon coordinates, that the plane should fly at M0.84, and at 36,000 ft. The  $3^{rd}$  line specifies the lat/lon coordinates, that the speed should be set automatically, and at 36,000 ft. The  $4^{th}$  line specifies the lat/lon coordinates and that the speed and altitude should be set automatically.

### 8.3 Custom Visual Approaches

Navigraph data covers most published IFR approaches such as ILS and RNAV but does include data for visual approaches but the user can set these up if desired. WorldTraffic will have GA aircraft fly standard patterns which can be tuned in the Airport Operations file but especially in mountainous areas, visual approaches follow very specific routes to avoid terrain. Sample approaches are included and are in the "XPlane\ClassicJetSimUtils\WorldTraffic\VisualApproaches" folder. Sub-folders can be created in this folder for specific airports. Example approaches are included for Innsbruck, Austria (LOWI) in this folder: "Xplane\ClassicJetSimUtils\WorldTraffic\VisualApproaches\LOWI"

Looking at LOWI, visual approaches are included runways 8 and 26 covering approaches from the east and the west in the valley to follow the routes as shown in the below.



The example file below is "Rwy26\_LightProp\_VisualCircling\_East.txt" and specifies the visual approach for runway 26, approaching from the east. You'll see that the waypoint above are entered into the route below. I use Google Maps to determine that lat/lon coordinates of the waypoints. Approaching from the east the first waypoint is specified as the Rattenberg NDB (AB). The next waypoint is at distance 4.2 Nm from the OEV Localizer. I added an extra waypoint 2Nm from the threshold followed by the runway threshold, RWY26. The next waypoints define a missed approach. The plane climbs at a max speed of 159 kias on a heading of 264 degrees until at 3700 feet to clear the high terrain and once done so will head to H084 which is is that D3.5 OEV waypoint. From there when the route ends, the plane will look for another suitable approach, in this case the one for RWY26 approaching from the west which will have that last waypoint as one of it's first waypoints. A missed approach path should be defined to lead the plane into the start or middle of another approach.
// <--- these forward slashes indicate that the line is a comment // Multiple runways may be entered on one line below with spaces in between the // names Runway 26 26R // Enter any number of types from the the list of aircraft types defined in // Table 1- Aircraft Types AircraftType 8 9 // In the below section, use 0 to use auto values for speed and altitude. The last // waypoint can be the runway threshold but a missed approach path should be // entered after the runway position. // The runway format is RWY###, eq RWY08, RWY36L, RWY3R. // Data may be entered in 3 ways and use this number as the waypoint type 11 1. Position with lat and lon. In this case set heading to 0. 2. A requested heading. In this case set lat and lon to 0 . Waypoint is 11 11 advanced when desired heading is achieved. 11 3. A requested heading to assigned alt. In this case set lat and lon to 0. 11 Waypoint is advanced when desired altitude is achieved. 11 4. A vector. The plane will fly on the assigned heading until the calculated 11 arrival time is ok to fit in with other traffic. 11 If an altitude is specified, the plane must make it to that altitude before 11 the vector will end.

The below image and the one above were used to generate the visual approaches for LOWI.



# 9 Building Aircraft for WorldTraffic

Aircraft (or boats or vehicles) are defined by 3 main files:

- Aircraft Definition File These are located in the "XPlane\ClassicJetSimUtils\WorldTraffic\AircraftTypes" folder. This file is associated directly with one aircraft object file so is unique to a specific aircraft and paint scheme. It mist have the same name as the Aircraft Object file. The file also has a link to an Aircraft Definition Base File
- Aircraft Definition Base File This file is shared by 1 or more Aircraft Definition files and contains all of the performance parameters and basic dimensions of the aircraft type. It resides in the same folder as the Aircraft Definition file and is identified by the "\_BASE.txt" suffix.
- Aircraft Object These are located in the "XPlane\Custom\_Scenery\WorldTraffic\_Library\Aircraft" folder and comprise a .obj file with the same name as the Aircraft Definition file except with a .obj suffix. These have associated .png or .dds texture files. They are standard X-Plane Obj8 format object files.

Any new aircraft added to World Traffic must have these files and the aircraft object file names must be in the "XPlane\Custom Scenery\WorldTraffic\_Library\library.txt" file.

## **Aircraft Definition File**

The aircraft definition and base files are defined between the **START** and **END** key words. All other text outside of this block can be used for description. Again, note that all files are space-delimited (no TABS allowed) and file names can not include spaces. Fields can be in any order in the file. Fields may be excluded if they are not applicable. For example boats don't require AOA values and helicopters don't require wing spans. The following are the supported aircraft definition fields:

- 1) **Operator** The optional operator of the aircraft. Leave blank for general aircraft types that you want to see everywhere like light privately-owned general aviation aircraft or use one of the 4 character ICAO operator codes from this list: <u>http://en.wikipedia.org/wiki/Airline\_codes-All</u>
- 2) **Operator\_IATA** The 2-character IATA operator name if known. This is used along with the flight number range as defined below to randomly generate a callsign for display on the ATC radar if a callsign is not defined in the flight plan.
- 3) Alternate\_Operator An alternate operator that will be used to search for autogen flight plan routes or search for ground routes if no ground routes are found for the Operator. Some airlines hae subsidiary airliners often not identified in the database. For example Air Canada (ACA) has a spninoff called Air Canada Rouge (ROU). So for the Rouge plane, enter ACA as an alternate operator.
- 4) **FlightNumberRangeLow** The flight number range is used to automatically come up with a flight number for a randomly-generated flight. For example if the operator is ACA and the flight number range is 10 to 9999, you could have a flight generated with a flight number of ACA224. This is used in auto-generated flights. The fixed and tabular flight plans require a flight number.
- 5) FlightNumberRangeHigh See above.
- 6) Military Set to 0 for a civil aircraft and to 1 for a military aircraft. This is used for autogenerated flight plans and also to determine where aircraft can park.
- 7) **Cargo** Set this to 0 for a non-cargo aircraft and to 1 for a cargo plane. It is used to find appropriate parking spots.

- 8) **UniqueLivery** Set this to 1 to indicate that the plane is a one-off and should only be loaded once. Set to 0 otherwise.
- 9) **OperatingRegion** Enter the ICAO region code for this. It is used for auto-generated flights to mainly keep military aircraft from other countries outside of the one you are generating flights for so you won't see Mig-29 flights being generated in the U.S.
- 10) **HomeBases** Enter airport ICAO codes separated by spaces. This is used for auto-generated flights to determine where to send military planes to and from that might be generated at your airport.

### **Aircraft Base Definition File**

#### Name and Identification Fields

- Type NOTE: Type must go before all other fields listed below! This is an integer value used by the application for runway allocation and flight modelling. See the table here for various aircraft types: <u>Table 1- Aircraft Types</u>
- 2) Name ICAO name of aircraft displayed in X-Plane in the flight/aircraft information windows. A list of aircraft ICAO names can be found <u>here</u>.
- 3) IATA IATA name of aircraft displayed in X-Plane in the flight/aircraft information windows. A list of aircraft IATA names can be also found <u>here</u>.
- 4) **IATA\_Alternate** An alternate IATA name for the aircraft used when generating random flights.
- 5) **StartYearOfOperation** The year the aircraft entered service with the operator.
- 6) **EndYearOfOperation** The year the aircraft stopped flying with the operator.

#### **Aircraft Configuration Fields**

- 7) **NumEngines** Allowed values between 0 and 4.
- 8) **EngineType** Integer value used to determine sound type, engine performance, and to set animation values. Available engine types are as follows:
  - 0 Fighter turbojet
  - 1 Turbofan
  - 2 Light jet (not yet supported)
  - 3 Turboprop
  - 4 piston prop
  - 5 big prop, non-turboprop (not yet supported)
  - 6 helicopter
  - 7 boat (not yet supported)
  - 8 car (not yet supported)
  - 9 diesel vehicle (not yet supported)
- 9) **MTOW** Maximum takeoff weight of the aircraft.
- 10) Weight Set to MTOW minus fuel weight.
- 11) AfterburnerThrust (optional) Total engine thrust of all engines combined with the afterburner on.
- 12) MaxThrust Maximum, non-afterburning thrust of all engines combined. For prop planes, determine an effective thrust from the prop. A plane like a Lancair Columbia has a thrust:weight ratio of 0.28. A plane such as the C-130 Hercules has a thrust:weight ratio of 0.27. You can adjust thrust to increase or decrease acceleration and climb rate.
- 13) HasSpeedBrakes Set to 1 (true) if the aircraft has speed brakes (used for drag calc and

animation).

- 14) HasRetractableGear Set to 1 (true) if the aircraft has retractable gear (used for drag calc and animation).
- 15) **NumberFlapSettings** If FBWflaps below is set to zero, enter the number of distinct flap positions available.
- 16) **FBWflaps** Set to 1 (true) if the flaps are controlled by a FBW system and change position continuously in an infinite number of positions.
- 17) **VariableSpeedBrakes** Set to 1 (true) if the speed brakes can be set to any position between retracted and extended, otherwise they will be open or closed only.
- 18) GearRetractTime Time in seconds for the gear to retract.
- 19) FlapExtensionTime Time in seconds for the gear to extend fully.
- 20) HasTaileron Set to 1 if plane has taileron like found on F-14.
- 21) AileronCutoutSpeed Speed (kias) at which ailerons don't move and roll is controlled by spoilers and taileron.
- 22) LogoLightAlt Altitude at which below logo light turns on. Defaults to a value around 15,000 ft if no defined.

#### Dimensions

- 23) **GroundPitchAngle** Pitch angle of the aircraft when it is on the ground used when drawing the aircraft. Change this value to level the aircraft if you find the nosewheel in the air or under the pavement.
- 24) Length Length in meters of the aircraft, used for ground collision avoidance and turn radius calculations.
- 25) Wingspan Wing span in meters.
- 26) BodyDiameter Approximate frontal area of the aircraft used in the drag calculation.
- 27) MainGearLength This is the length between the center line of the aircraft object to the bottom of the main landing gear when it is compressed. Below is a screenshot of an aircraft in AC3D showing how to determine these dimensions. Note that the aircraft object must be placed such that the rear-most part of the main landing gear is at the zero Z coordinate position and so that the center of gravity axis aligns with the Z axis. The aircraft will rotate about these axes. The center of gravity may not be quite at the same position as the rear landing gear but it's pretty close. The application depends on the aircraft being oriented like this since it calculates the distance from the ground to the landing gear based on this setup.



- 28) MainGearWheelRadius Radius in meters of the main gear wheels, used for animation.
- 29) MainGearMaxComp Distance in meters that the main gear compresses on the ground if any.

- 30) NoseGearWheelRadius Radius in meters of the nose gear wheel/s, used for animation.
- 31) **NoseGearMaxCompression** Distance in meters that the nose gear compresses on the ground if any.
- 32) NoseGearParkedCompression not used
- 33) **DistanceToNoseWheel** Distance in meters between the the Y axis and the center of the nose wheel. It is used for positioning a plane when parking when you have the ground route PARKING\_CENTER option set to NOSEWHEEL.
- 34) **DistanceToPassDoor** Distance in meters between the the Y axis and the center of the door that you want to have next to a jetway gate when you park. It is used for positioning a plane when parking when you have the ground route PARKING CENTER option set to DOOR.
- 35) **DistanceToPassDoor2** This is the distance to a second door. For heavy aircraft, often jetway extends to the second door after the first class section of the aircraft. It is used for positioning a plane when parking when you have the ground route PARKING\_CENTER option set to DOOR2.
- 36) MainGearTrack Distance in meters between the left and right main gear.

#### **Performance Fields**

- 37) Ceiling Max altitude in feet that the aircraft can fly at.
- 38) **Range** The maximum range of the aircraft in Nm.
- 39) **ClimbSpeed** Typical climb speed in knots (kias) that the plane will fly at in a normal climb (not max climb speed).
- 40) **CrusieMach** The typical cruise Mach speed of the aircraft at its cruising altitude.
- 41) **CruiseSpeed** The speed (kias) at which the CruiseAOA value is defined for, not necessarily the real aircraft's cruise speed. This is used only for for AOA calculations. Almost always 290 kias for airliners.
- 42) MaxSpeed The maximum speed (kias) that the aircraft can fly at in level flight.
- 43) MaxMach The maximum Mach value that the aircraft can fly at in level flight.
- 44) LandingSpeed The normal final approach speed (kias) of the aircraft.
- 45) **TakeoffSpeed** The normal takeoff speed (kias) of the aircraft.
- 46) NoseDownSpeed The speed at which the nose gear drops during landing. This is normally equal to LandingSpeed except where the aircraft sits on its main gear during landing for aerodynamic braking. Planes like the F-16 and F-15 use aerodynamic braking with nose down speeds of around 100 kias.
- 47) MaxLandingFlapSpeed The speed (kias) at which the flaps move to their full extension.
- 48) MaxTakeoffFlapSpeed The speed (kias) at which the flasp move to their takeoff position which is 30% of full travel. The gear extension speed is set to 5 knots below this value.
- 49) **TakeoffDistAtMTOW** Entered in feet. This value can usually be found in wikipedia for most aircraft. It's the takeoff distance at sea level, no wind, and standard conditions at the aircraft's maximum takeoff weight.
- 50) LandingDist This is the landing distance in feet of the aircraft with a light fuel load.
- 51) MinLandingDist This is distance that the aircraft will stop in if landing on a short runway, less than the value entered above.
- 52) LandAOA Angle of Attack of the plane during landing, used for lift calculation. This should be about 6 degrees for a plane with slats and 3 degrees for a plane without slats. Some fighters like the F-16 have a landing AOA or on-speed AOA of 8 to 10 degrees.
- 53) **TakeoffAOA** Angle of Attack of the plane during takeoff, used for lift calculation. It's normally about 3 to 5 degrees.
- 54) CruiseAOA Angle of Attack of the plane at the entered cruise speed.

#### Factors

- 55) Cd Aircraft drag coefficient used in the drag calculation. If you find that the aircraft is no accelerating as fast as it should or if can't reach its top speed, try lowering the drag coefficient or adjusting the BodyDiameter value.
- 56) **BrakingFactor** (0.0 to 1.0). The default is 0.0. Increase it slightly if the aircraft landing distance is too long. Values between 0.0 and 0.2 are typical.
- 57) **GroundDragFactor** (0.0 to -3.0). The default is 0.0. Decrease if the aircraft is accelerating too slowly on takeoff. Values of -2.5 are typical of regional prop planes like the Dash-8 or ATR.

#### **Navigation Configuration**

- 58) hasFMS This defaults to 1 (true) for all aircraft aside from light props. If set to 0 the aircraft won't use STAR approaches or SID departures.
- 59) **NavSystemNPA** Set to 1 if the aircraft has navigation systems to perform non-precision approaches or 0 if not. Default is 1 for all aircraft types.
- 60) **NavSystemRNAV** Set to 1 if the aircraft has navigation systems to perform RNAV approaches or 0 if not. Default is 1 for all aircraft types.
- 61) **NavSystemILS** Set to 1 if the aircraft has navigation systems to perform ILS approaches or 0 if not. Default is 1 for all aircraft types except for helicopters.
- 62) **NavSystemILS\_CAT\_I** Set to 1 if the aircraft has navigation systems to perform ILS CAT I approaches or 0 if not. Default is 1 for all aircraft types except light props and helicopters.
- 63) **NavSystemILS\_CAT\_II** Set to 1 if the aircraft has navigation systems to perform ILS CAT II approaches or 0 if not. Default is 1 for super-heavies, heavies, large jets, large props, medium jets and medium props.
- 64) **NavSystemILS\_CAT\_IIIa** Set to 1 if the aircraft has navigation systems to perform ILS CAT IIIa approaches or 0 if not. Default is 1 for super-heavies, heavies, large jets, and medium jets.
- 65) NavSystemILS\_CAT\_IIIb Set to 1 if the aircraft has navigation systems to perform ILS CAT IIIb approaches or 0 if not. Default is 1 for super-heavies, heavies, large jets, and medium jets.
- 66) **NavSystemILS\_CAT\_IIIc** Set to 1 if the aircraft has navigation systems to perform ILS CAT IIIc approaches or 0 if not. Default is 1 for super-heavies, heavies, and large jets.

#### Particle Effect Configuration for Contrails, Tire Smoke, and Afterburner Flame

- 67) EngineExhaustArea In square meters. This is used to determine size of engine contrails.
- 68) WingTip\_X/Y/Z The three field defining the position of the aircraft wing tip in the 3D model used to place wingtip contrails. The value is mirrored for the other side as well.
- 69) Engine1\_X/Y/Z The three fields (Engine1\_X, Engine1\_Y, and Engine1\_Z) defining the position of the aircraft engine #1 in the 3D model used to place engine contrails. The value is mirrored for the other side as well. So for a plane with 2 engine, you need to define just engine 1 values. For a plane with 4 engines, you need to define engine 1 and 2 positions. For a plane with 3 engines, with one being on the center like in a DC-10, the x value would be 0 and for cases like this where the engine is in the center, the value is not mirrored.
- 70) Engine2\_X/Y/Z as above for aircraft with up to 4 engines.
- 71) **Engine3\_X/Y/Z** as above for aircraft with up to 6 engines.
- 72) Engine4\_X/Y/Z as above for aircraft with up to 8 engines.
- 73) Wheel1\_X/Y/Z The three fields (Wheel1\_X, Wheel1\_Y, and Wheel1\_Z) defining the position of the main gear in the 3D model used to place tire smoke. The value is mirrored for the other side as well. So for a plane with 2 main wheels or bogeys, you need to define just

wheel 1 values. For a plane with 4 wheels or bogeys, you need to define wheel 1 and 2 positions. For a plane with 3 wheel bogeys, with one being on the center like in a DC-10, the x value would be 0 and for cases like this where the wheel bogey is in the center, the value is not mirrored.

74) Wheel2\_X/Y/Z – as above for aircraft with up to 4 wheels or wheel bogeys.

### **Other Guidelines:**

- The Nav Systems defined for the aircraft are used in conjunction with the nav systems supported by the various runways as defined in the Airport Operations file. Using the current weather ceiling and visibility and the aircraft nav systems and the nav systems supported by the runways, World Traffic determines if the aircraft can land or not.
- Wikipedia is a great place to get aircraft specs from. For example all the numbers required for a 787 can be found here: <u>http://en.wikipedia.org/wiki/Boeing\_787\_Dreamliner</u>
- To reiterate, the aircraft object should be placed so that the z axis goes through the center of gravity on the aircraft as shown in the figure above. This is the axis that the aircraft will be rotated around when banking.
- The cruise AOA that is set is used at the aircraft cruise speed and should normally be around 0 to 2 degrees. Lower this value if the aircraft seems to be flying with the nose excessively high or set the aircraft cruise speed lower. The cruise speed is only used for determining AOA.
- Cruise speed and max speed are in knots indicated and should be set using the published cruise Mach and max Mach numbers as published with the altitude set to 25,000 feet. Use this calculator here to determine the cruise speed and max speed in knots:
   <a href="http://www.hochwarth.com/misc/AviationCalculator.html">http://www.hochwarth.com/misc/AviationCalculator.html</a> In the very bottom section, set the altitude as 25,000 feet, enter the Mach number and press the "Compute CAS/TAS/EAS" button. Use the CAS speed. The cruise speed is used mostly for calculating the AOA. The plane is limited by the lesser of max speed and max Mach.
- Aircraft weight should be set to the aircraft's MTOW minus the fuel weight.
- Thrust should be set to the maximum available thrust so for the 787-8, this value would be 64,000 lbs X 2 = 128,000 lbs. Afterburner thrust if defined should be set to thrust if the aircraft has no afterburner.

Here is the work flow I follow when creating aircraft definition files:

- Set takeoff speed to Vr at MTOW in the aircraft definition file. If it can't be found, use a value from a comparable aircraft.
- Set climb speed to a normal value. I think I use 290 knots for most of the jetliners.
- Cruise speed is only used for AOA calcs and should be set to 295 for jetliners or about 80% max speed.
- Set MaxSpeed to Vmo.
- Set MTOW to data found online
- Set Weight to MTOW minus fuel capacity in pounds.
- Set LandingSpeed equal to landing speed at Weight value above (not MTOW)
- Set NoseDownSpeed to LandingSpeed for most planes except planes like F-15s or F-16s that use aerodynamic braking.
- Set TakeoffDistAtMTOW to data found online
- Set LandingDist equal to landing distance data for the aircraft weight set to the weight value above (not MTOW).

- Create a flight plan with departure and arrival airports as far apart as possible so that aircraft will takeoff at MTOW. Make sure that the departure airport is at sea level and the winds are calm. Test that the aircraft takes off at the specified takeoff distance at MTOW. If it's taking off in too little runway, reduce the thrust a bit. If it's taking too much runway to takeoff, increase thrust slightly, but not more than 10%. If still using too much runway, set the "GroundDragFactor" from 0 to -3.0 min to reduce calculated drag. This seems to be required for some prop planes like the Dash-8 for which I have this value set to -2.5.
- Check out the landing distance for the aircraft to make sure it's close to specs. If the plane takes too much runway, increase BrakingFactor. It's often at around 0.4 for the smaller jets.
- Create a flight plan such that an AI plane is level at 35,0000 feet and flying at its cruise Mach Speed. Adjust Cd so that engine speed is at around 88%.
- Make sure that the type is correct. This table below shows how aircraft should be classified:

## Appendix A – World Traffic Datarefs

These datarefs are as follows and are all single floating point numbers unless otherwise specified. They can be used to retrieve telemetry information about WorldTraffic aircraft like used by the WorldTraffic radar or to set aircraft animation values done by WorldTraffic.

All ratios vary between 0.0 and 1.0 with 0.0 being closed or retracted.

- Writable Datarefs for Aircraft Animation:
- cjs/world\_traffic/hstab\_ratio
- cjs/world traffic/rudder ratio
- cjs/world traffic/aileron ratio
- cjs/world traffic/roll spoiler ratio L
- cjs/world traffic/roll spoiler ratio R
- cjs/world traffic/flaperon ratio L
- cjs/world traffic/flaperon ratio R
- cjs/world traffic/taileron ratio L
- cjs/world\_traffic/taileron\_ratio\_R
- cjs/world\_traffic/lef\_ratio
- cjs/world\_traffic/tef\_ratio
- cjs/world\_traffic/speed\_brake\_ratio
- cjs/world\_traffic/door\_ratio
- cjs/world\_traffic/main\_gear\_wheel\_angle
- cjs/world\_traffic/main\_gear\_retraction\_ratio
- cjs/world traffic/main gear deflection
- cjs/world\_traffic/nose\_gear\_wheel\_angle
- cjs/world\_traffic/nose\_gear\_steering\_angle
- cjs/world\_traffic/nose\_gear\_deflection
- cjs/world\_traffic/nose\_gear\_retraction\_ratio
- cjs/world traffic/gear door ratio1
- cjs/world traffic/gear door ratio2
- cjs/world\_traffic/gear\_door\_ratio3
- cjs/world traffic/tail hook ratio
- cjs/world traffic/nozzle position
- cjs/world\_traffic/landing\_lights\_on
- cjs/world\_traffic/wing\_landing\_lights\_on
- cjs/world\_traffic/taxi\_lights\_on
- cjs/world traffic/nav lights on
- cjs/world traffic/beacon lights on
- cjs/world traffic/strobe lights on
- cjs/world\_traffic/afterburner\_on
- cjs/world traffic/pilots in plane
- cjs/world\_traffic/engine\_rotation\_angle1

- // opens and closes with gear
- ${\ensuremath{\prime\prime}}$  opens before gear and closes after gear
- // only open when gear is extending or retracting

- cjs/world\_traffic/engine\_rotation\_angle2
- cjs/world\_traffic/engine\_rotation\_angle3
- cjs/world\_traffic/engine\_rotation\_angle4
- cjs/world\_traffic/engine\_rpm1
- cjs/world\_traffic/engine\_rpm2
- cjs/world\_traffic/engine\_rpm3
- cjs/world\_traffic/engine\_rpm4
- cjs/world\_traffic/engine\_rad\_per\_sec1
- cjs/world\_traffic/engine\_rad\_per\_sec2
- cjs/world\_traffic/engine\_rad\_per\_sec3
- cjs/world\_traffic/engine\_rad\_per\_sec4
- cjs/world\_traffic/thrust\_reverser\_position
- cjs/world\_traffic/drag\_chute
- cjs/world\_traffic/wiper\_angle
- cjs/world\_traffic/ground\_speed
- cjs/world\_traffic/mach
- cjs/world\_traffic/altitude\_asl
- cjs/world\_traffic/altitude\_agl
- cjs/world\_traffic/destroy\_ac
- Readable Aircraft Telemetry Datarefs:
- cjs/world\_traffic/num\_aircraft
- cjs/world\_traffic/aircraft\_trackcam\_id
- cjs/world\_traffic/aircraft\_type
- cjs/world traffic/id
- cjs/world\_traffic/alt\_asl
- cjs/world\_traffic/speed\_kias
- cjs/world\_traffic/heading\_degT
- cjs/world\_traffic/aircraft\_lat
- cjs/world\_traffic/aircraft\_lon

- // Only available for landing aircraft or when in terrain-following flight mode as specified in the flight plan.
- // Pass in aircraft id as found in the "id" integer array described above to destroy specified aircraft and to display damaged model (integer).
- // Number of aircraft currently being rendered
  (integer)
- // Aircraft id currently being viewed by track camera
- // Aircraft Type see Appendix A3 for types
  (integer array)
- // Aircraft Identifier (integer array)
- // Altitudes of all aircraft (float array)
- // Speeds of all aircraft (float array)
- // Heading of all aircraft (float array)
- // Position of all aircraft (float array)
- // Position of all aircraft (float array)





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