PILOT'S TUTORIAL

This manual was compiled for use only with the PMDG Jetstream 41 simulation for Microsoft® Flight Simulator™ X. The information contained within this manual is derived from multiple sources and is not subject to revision or checking for accuracy. This manual is not to be used for training or familiarity with any aircraft. This manual is not assumed to provide operating procedures for use on any aircraft and is written for entertainment purposes.

The Precision Manuals Development Group Web Site can be found at:
http://www.precisionmanuals.com

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The PMDG Jetstream 41 Development Team

The PMDG development team is recognized throughout the simulation community for producing ground breaking airliner simulations. The PMDG J41 was developed by the following individuals:

· Jason Brown
· Armen Cholakian
· Matt Kaprocki
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Guest Developer - XLS-GNS FMS

· Ernie Alston

Thank You!

In any project of this scope, there is always a very dedicated development team. For a development team to succeed, there must be an unwavering commitment to the fine detail of the product and to the product quality. While the dedicated experts on the PMDG development team have raised realism in flight simulation to a science, we depend very heavily upon the dedication of our beta team to make our products the highest quality possible. Without these fine individuals, it simply would not be possible to bring you the quality level for which PMDG products are known.

We would like to thank the following individuals for their time, attention to detail, candor, sense of humor and sense of urgency during the development of this product.

- Mark Adeane
- David Bartoli
- Steve Cotterill
- Clay Dopke
- Dan Downs
- Jhan Jensen
- Mats Johansson
- Sam Johnnson
- Kurt Kalbfleisch
- Nick Landolfi
- George Morris
- Joe Panford
- Tero Partanen
- Bruce Ullyot
- Steve Weiher
- J. R. Whittaker
- Stan Winke
- Bryan York
- Urs Zwyssig

We would also like to put special notice on our Senior Beta Tester, George Morris, who has been beta testing for PMDG for a decade as of October, 2009. A decade in any endeavor is admirable, but a decade in a job that gets such poor recognition is truly inspiring. George, thank you for your efforts during the past decade, and we look forward to working with you over the next one!

All of us at PMDG would also like to thank Lauren Crocker at Northstar Aviation for helping us to arrange access to the J41s used in the creation of this product. We would also like to thank the many the fine technicians at Northstar Aviation's facility in Mena, Arkansas who, in spite of conducting a last minute engine change in order to ship a refurbished J-41 overseas, were gracious and accommodating of every request as we photographed, measured and recorded around their work.

Dedication

At PMDG we do not normally dedicate our products to specific groups or individuals, but with this project we decided to do something a bit different. The BAe JetStream 4100 was operated in the United States by powerful little company called Atlantic Coast Airlines. ACA, based out of Washington Dulles International Airport had humble beginnings with a handful of borrowed J-31s and EMB-120s, but grew to be one of the most powerful (and profitable) regional airlines that the industry had seen as of the first few years of this millennium. Operating more than 150 aircraft, ACA covered the eastern US flying in the colors of United and Delta airlines and was an industry leader in performance, quality of life for employees and innovative approaches to the complex business of regional airline operations. Unfortunately, ambition, disregard for history and poor timing combined to make this airline an anecdote for history, forgotten by all but those who worked there.

At its peak, Atlantic Coast Airlines was the world's largest operator of JetStream 41 aircraft. For this reason, we dedicate the effort required to produce this simulation to the men and women who worked there. From the maintenance shop to the ramp, the gate areas, ticket counters, dispatch desks, cockpits, cabins and yes, even the crew scheduling desks, ACA employees ran a large airline that never stopped feeling like a big (if not sometimes dysfunctional) family.

ACA may be gone, but the friendships made there live on. This airplane is for all of you.

Captain Robert S. Randazzo
Precision Manuals Development Group
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Introduction

PMDG BAe JetStream 4100 Pilot's Tutorial

This tutorial will walk you through a typical line flight flown in the BAe JetStream 4100. The flight will originate at White Plains, NY, USA (KHPN) and end at Washington Dulles International Airport in Washington, DC. (KIAD)

Who Should Fly This Tutorial?

The JetStream 4100 has some operational quirks that all pilots should be familiar with, or you will experience frustration while trying to fly the airplane. The engines, for example, have very specific operating procedures to keep them healthy. Take a few moments to read through the tutorial and you will reap tremendous enjoyment from this simulation!

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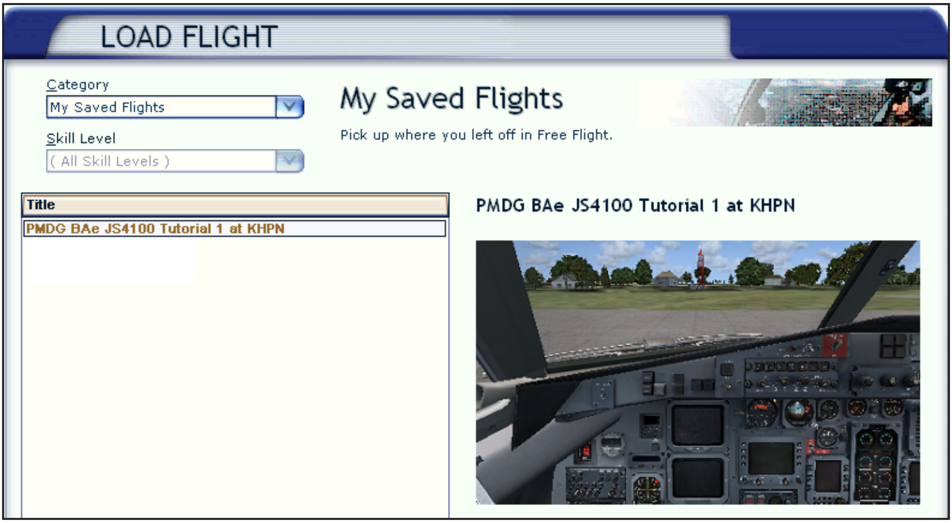
The Tutorial Setup

To begin, you will want to launch Flight Simulator X. From the "Create A Flight" menu, choose any airplane and airport combination. Then, once the sim has launched, open the FLIGHT menu, then select LOAD…

NOTE: It is a quirk of FSX that you cannot load the tutorial directly from the Create-A-Flight menu. This is why we recommend that you run the sim, then select FLIGHT/LOAD from the FSX menu.



From the menu, choose the *PMDG BAe JS400 Tutorial 1 at KHPN* from the list of saved flights.

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The Tutorial Background

Today's flight from KHPN to KIAD is scheduled for a 1400h departure. The weather is a high broken overcast with scattered thunderstorms in the NY Metro area. We are anticipating departing from runway 34 at KHPN.

When the flight loads, you will find the airplane parked in a typical "long turn" condition. The airplane is closed up and powered down, but surrounded by the ground support equipment necessary to board passengers and be underway.

The airplane is chocked with hazard pylons under each wing and the tail respectively. A small baggage cart is present for customer carry-on items. The main cabin door, the baggage pod and the aft cargo doors are closed in order to prevent unauthorized access to the airplane.

Ground Power Unit is attached to the airplane, ready to provide power.

What is My Perspective?

To make operation of the PMDG BAe JS4100 more intuitive, we have assembled a range of pre-programmed cockpit view positions. The initial cockpit view is the captains normal forward-looking viewpoint, and the remaining views can be reached by moving forward and backward through them using "A" and "SHIFT+A" respectively. The views available are:

1) Captain's Normal View
2) Captain's View Right looking at engine display/coaming panel.
3) Zoomed in view of the FMS.
4) First Officer's View Left looking at engine display/coaming panel.
5) First Officer's Normal View.
6) First Officer's View of Center Pedestal
7) Plan View of Overhead Panel
8) Captain's View of Center Pedestal

You can easily pan around these views by holding the space bar and moving your mouse. You can zoom in and out using the +/- keys, or by scrolling your mouse wheel while holding the space bar. You will find that zooming in and out on items that require your attention very closely mimics the process of leaning in to take a close look at things as you would in on a real flight deck!

When done zooming in, simply hit CTRL+SPACE to instantly reset the view to its original location and zoom factor.

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Interacting with the switches and knobs

Many of the switches on the PMDG BAe JetStream 4100 are rocker-type switches that can have two or three positions. As such, we have implemented a process to allow you to right or left click in order to move the switch. Generally speaking, to push a switch FORWARD or UP you right click. To push a switch DOWN or LEFT you left click.

Switch guards are always right-click-to-open.

Some switches, such as TEST switches are normally "Hold-To-Test" switches in the real airplane. In the simulation we have made them click-on/click-off switches in order to facilitate your ability to look around the cockpit while the test is running.

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Thirty Minutes and Counting!

Once the tutorial has loaded, press SHIFT+E to open the main cabin door, or bring up the PMDG J41 Ramp Manager by pressing SHIFT+2.

The PMDG J41 Ramp Manager allows you to select and de-select various support equipment to help with servicing your airplane. Items that are currently selected appear in green, while items that have been de-selected appear in red.

From this menu you can show/hide the flight crew, overnight parking kit, chocks, safety pylons, passenger baggage cart, a rope stanchion and a Ground Power Unit to provide AC power while parked. You can also open/close the main cabin door, the baggage pod doors and the aft cargo door.

Aircraft Acceptance

Now that we have arrived plane-side, get your flight kit stowed, and pull out your PMDG BAe JS4100 Flight Operations Manual. (You can find this manual in PDF for by going into the Windows START/PMDG Simulations menu.)
Chapter 4, page 12 is where the Aircraft Acceptance checklist starts. Skip down to b) Acceptance Check Expanded and follow through each item from inside the virtual cockpit.

When you reach item f), it is time to put power to the airplane. The ammeter check is located on the overhead panel, directly above the captain's head. Rotate the knob to BATTERY and check to be certain that you have battery voltage greater than 24.0. Next rotate the knob to EMERG/GPU in order to check that sufficient voltage is available from the GPU:

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Now that we know sufficient voltage exists, we can power the airplane first selecting BOTH left and right batteries to ON, then selecting the GPU to ON.

When both batteries and GPU are selected ON, you will see the following pattern of lights on the overhead electrical control panel:

This pattern is telling you that power is coming from the GPU, both batteries are disconnected from the system since they are not needed, and the Bus Tie Breaker is closed so that the GPU can power both the Left and Right Essential busses. We are now ready to begin our preflight!

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TIP: When you power up the airplane, the Caution/Warning system will become operative. Since the engines are shut down and various subsystems are not configured for flight, the Caution/Warning system is going to begin making all kinds of dings and dongs and generally creating a din that you will grow tired of listening to. When you power up the airplane, you should get in the habit of reaching down to the Caution/Advisory Panel (CAP Panel) and pushing the MUTE button. Use this mute button any time you are on the ground and the engines are not running.

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Exterior Preflight

The exterior preflight will give you a good overview of the JetStream 4100. The Exterior Preflight procedure is well documented in the manual beginning at Chapter 4, Page 14. I won't review the exterior preflight here, since you can easily follow through that inspection and then return here!

Before conducting the exterior preflight, I generally recommend turning all the airplane external lights to ON. This will allow you to check for bulb failures during the walk around.

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Cockpit Preparation

The PMDG BAe JS4100 Flight Operations Manual has a very detailed cockpit preflight and setup procedure. For this tutorial, I am going to walk you through an abbreviated procedure that will help you quickly prepare the cockpit for boarding and startup. I encourage you to spend a few flights using the Chapter 4 Normal Procedures, however as they will help you to learn how the airplane operates!

It is now just slightly after 1330h, so we have a bit less than a half hour to get ready for departure. The cockpit preparation check is designed to ensure the airplane is properly equipped and ready for flight.

Here at White Plains, we have the ground power cart available, so we will also want to bring the Avionics online in order to give the Attitude Horizon Reference System (AHRS) an opportunity to align during our normal preflight duties. Switch both avionics power switches on. The avionics power switches are found on the overhead panel on the captain's side:

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In the event that we are operating on battery power for the start, this will not be possible.

If you forget to bring the Avionics online, and later in the cockpit setup you turn the avionics switches on, you will likely notice that the AHRS is not aligned and as such you have no information displaying on your Electronic Attitude Director Indicator (EADI) or your Electronic Horizontal Situation Indicator (EHSI).

They will look something like this:

When the AHRS aligns, you will have normal display indications. If you find yourself wanting to know how much time is left in the alignment process, you can select the Air Data Computer test switch to the 1 or 2 position, and the EHSI will become a count-down-clock of sorts. (see Side Console on page Ch081:9 of the PMDG_J41_AOM). AHRS alignment takes 180 seconds, so the compass begins counting down the seconds to AHRS alignment starting at 180 degrees and slowly rotating to 0.

In this image, we have approximately 125 seconds remaining until the AHRS is aligned:

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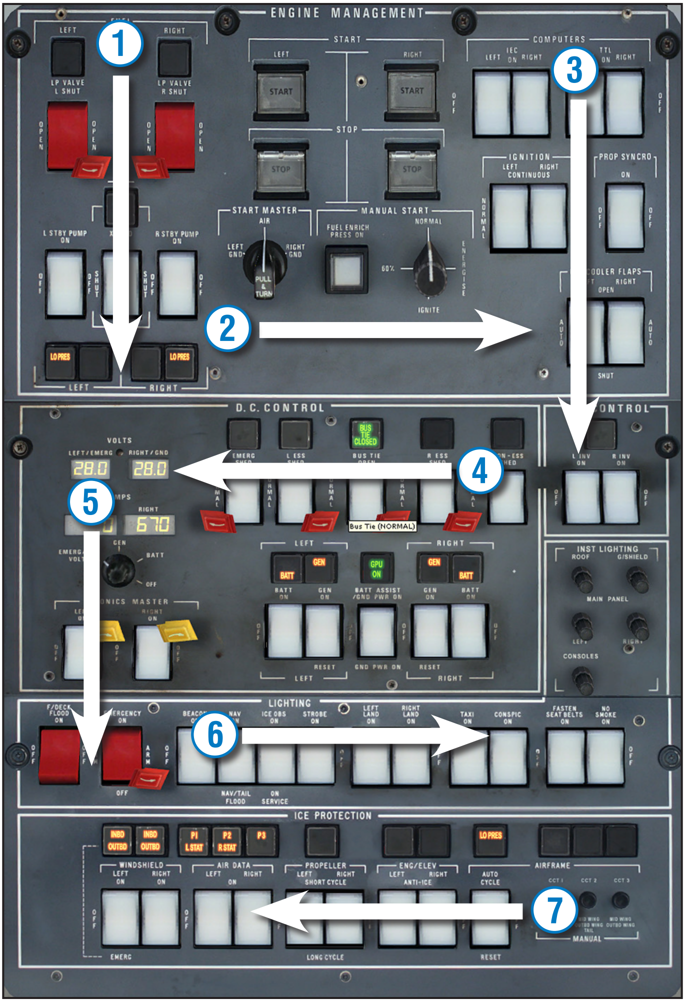
Preflight The Overhead

Whenever boarding a new aircraft for flight, the cockpit crew goes through a thorough preflight process in order to establish all systems and switch positions to their desired states. Now that we have the airplane powered up, lets walk through the basic preflight flow that will get you into condition for flight in the PMDG BAe JetStream 4100.



Follow through the arrows in sequence, paying attention to the items noted below:

1) Fuel Pumps: The Fuel LP Valve switches should be in their OPEN and GUARDED position. The CLOSED lights should not be illuminated. At this stage of the flight, the Left and right fuel pumps should be OFF and the LOPRESS lights should be illuminated.
2) The START MASTER should be set to AIR and the MANUAL START SELECTOR should be set to NORMAL.
3) Both IEC (Integrated Engine Computers) and both TTLs (Torque and Temperature Limiters) should be ON. These switches are never turned off except in an abnormal situation, so leave them on unless a checklist tells you otherwise. The IGNITION switches should be in NORMAL and the PROP SYNCH should be OFF. The OIL COOLER FLAPS should be set to AUTO.
4) The Left and right INVERTERS should both be ON, and all five BUS switches should be in their NORMAL positions.
5) The AVIONICS MASTERS should be ON, the FLIGHT DECK FLOOD should be as needed and the EMERGENCY LIGHTS switch should be in the OFF and GUARDED position.
6) All of the lights except the NAV lights should be in the OFF position, and the NO SMOKE and SEATBELTS signs should be turned ON.
7) All of the De-Ice switches should be OFF.

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Preflight Captains Panel

1) Beginning down at the Cabin Oxygen indication, check to be certain that at least 1600 psi. Then continue upward and to the right, ensuring that the ELT is not in the TEST mode and that the clock shows the correct time in ZULU. Set the Panel Flood lights as needed, and make sure that none of the override switches on the captain's coaming panel are on.
2) Continue to the right across the panel, noticing that the PILOT/CO-PILOT Flight Control Selector switch is set to the correct pilot flying the airplane. (Shown as pilot in this image, be certain to set it to CO-PILOT if you will be flying from the right seat!) Ensure that the SPOILER switch is OFF and that the AUTOPILOT/TRIM switch is ON.

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Preflight Center Pedestal

1) Starting above the Engine Instrumentation System, make sure that the PERFORMANCE RESERVE (APR) switch is OFF. Next, review the EIS to make sure no unusual readings are present. Verify that the fuel load is correct for your flight, then move down to the air conditioning panel.

   Here, you want to set the Temperature control knobs to their middle positions, verify that the Cabin and flight deck temperature control switches are in AUTO, and that the pneumatic air FLOW knobs are in the OFF position.

2) Move to the back of the center pedestal, make sure that the trims are centered, the flap handle is in the 0 position, then check to be sure that the fire bottle triggers are centered. Next, you will exercise the power levers, moving the individually through their full range of motion. You should hear the Takeoff Configuration Warning System sound when you move the power levers forward. The warning should silence as you move the lever back toward IDLE.

   Use the F2 key, the mouse or your hardware to pull each power lever back into the full beta range. Next, check the full range of motion for the condition levers by moving them full forward, then full aft. To move the condition levers into the feather range, press the red mushroom cap behind each lever, then pull the lever back. Return the condition levers to their TAXI position when finished. Next, check to be certain that the ANTI-SKID switch is ON, and the HYDRAULIC LP VALVE switches are OPEN.

   Next, make certain that you set the landing airport field elevation in the pressurization controller window. (310 feet for our flight today!)

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First Officer's Side Console

Use the A key to switch to the first officer's seat view position, then look down to the right of your right kneed. You will see a small box cover. Click to open the cover and reveal a number of test switches that you will need to actuate.

Push on the STBY POWER and STBY GEAR switches to illuminate the test results on the switches. The standby gear and standby power test indicators are located under a protective box cover on the First Officer's side console. You can also test the GPWS system from this location.

Next, actuate the Left and Right STALL switches, taking note that you see the red STALL captions illuminate on the coaming panel in front of each pilot and hear the stick shaker sound.

The SMOKE test and the FIRE SYSTEM TEST switches can be actuated to test the fire detection and smoke detection systems.

To round out the first officer's side panel preflight, press the black TEST button to the right of the gear handle to test the landing gear warning horn.

HINT: When using a switch, if you want to leave it in a position as if you were holding it with a finger, you can click on the switch, then drag your mouse away from the switch without releasing it. This will cause the switch to remain in the selected position while you look around the cockpit or observe the test results on other panels. To refocus the switch, simply repeat the click/drag off maneuver.

You have now completed a basic preflight of the PMDG BAe JetStream 4100 cockpit.

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The Engine Controls and Indications

Let's take a few minutes to talk through the engine controls and indications. (Operating procedures for the engines will be covered later in this tutorial.) Most of you have simulation experience with PT-6 type, free-turbine engines such as those found on the FSX King Air. The Garret TPE331-14 engines simulated on the PMDG BAe JetStream 4100 are geared, direct-drive engines. This means that the propeller is directly geared to the core of the engine through a series of reduction gears, providing for a completely different operating process than your average PT-6. One of many benefits to using a directly geared engine is that pushing forward on the power levers results in nearly instantaneous power.

The TPE331 engines have a well earned reputation for robust power and dependability, however if you attempt to operate them like you would any other engine, you are going to suffer catastrophic engine failures. This section of the tutorial will help to prevent that!

Geared engines work on the principle that the engine RPM remains constant and the blade angle of the propellers is manipulated to produce thrust. As a result there are two pairs of engine control levers on the center pedestal. The left pair is known as power levers and the right pair condition levers.

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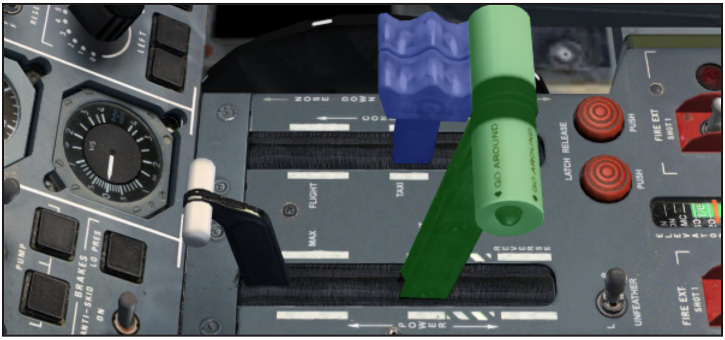


Power Levers: (left pair - green) Used to control thrust from full forward to reverse.
Condition Levers: (right pair - blue) Used to control the RPM of the engine core.

The power levers are use to adjust thrust, just as you would use throttles on a jet powered airplane. Through a very complex system of oil pressure management, the power levers adjust the blade angle of your propellers in order to provide thrust as commanded by the pilot.

The condition levers serve as very complex fuel control levers and are used to modulate the RPM of the engine core.

The engine's performance parameters are displayed on the Engine Instrumentation System, or EIS. The EIS provides the following information in digital form with needle movements for pilot awareness:

Torque Percentage
Exhaust Gas Temperature
Engine RPM
Fuel Flow

Torque Percentage: The thrust output for these engines is measured in terms of how much Torque is being exerted on the propeller by the engine. (Simplified explanation.) The maximum Torque output is considered to be 100% Torque. Although the engines are capable of providing greater than 100% Torque , this is not considered to be healthy for the long term viability of the engines.)

When setting thrust, Torque is your primary indication!

Exhaust Gas Temperature: Unlike jet engines, turboprop engines can be easily run into over-temp conditions by the careless pilot. As such, you will want to keep a vigilant eye on the EGT gauge. The EGT readout on the JetStream 41 is a dynamic EGT readout, changing parameters automatically to suite the phase of flight. You can see the current EGT limit displayed in the EGT LIMIT windows directly above the EGT dials. This EGT limit is reached when the needle reaches the red arc on the dial.

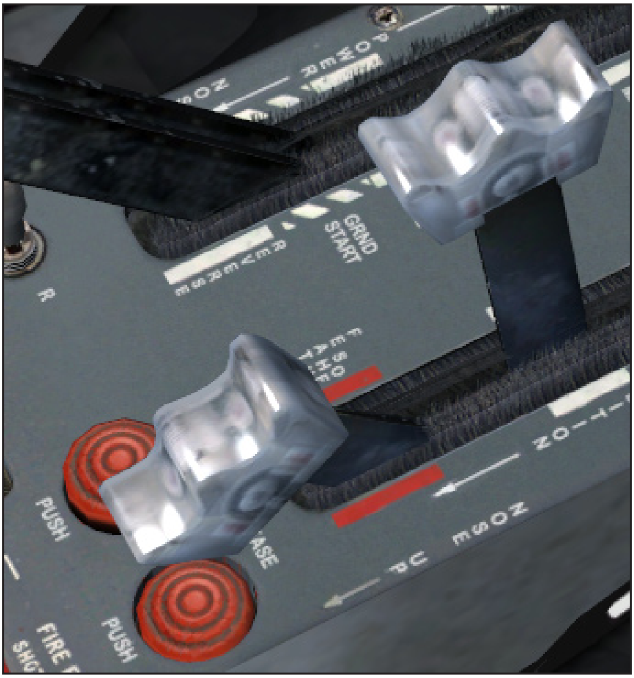
RPM: Engine RPM is displayed as a percentage of the maximum capability of the engine. The TPE331 -14 engines have essentially three operational RPM settings:

100%: Used for takeoff and Landing
98%: Used for climb, cruise and descent.
72%: Used for taxi.

For those of you unfamiliar with turboprop engines, you might find the amount of information being presented on the EIS to be a bit overwhelming. The following memory aid will help you to remember what controls are affecting which aspects of the engines:

TORQUE		Power Levers
EGT		Mixture of Power and Condition Levers
RPM		Condition Levers

On page 31 of the Normal procedures, you will be asked to test the position of the condition levers. The condition levers cannot be moved aft of the TAXI position unless you press the red UNLOCK button behind the lever. You can then move the lever into the FEATHER/CUTOFF position as show below:



To bring the lever out of the FEATHER/CUTOFF position, simply push the lever forward to the taxi position to complete the test.

HINT: With the power levers and the condition levers, you can move them by clicking on them individually with a mouse, or you can move them at the same time by clicking at the base of the levers on their left side. Doing so will allow you to manipulate both levers at the same time.

For the condition levers, you can move them in fine increments using the CTRL+F2/F3 keys. You can move them immediately between TAXI and FLIGHT using CTRL+F1/F4 respectively.

There are a few things you MUST NEVER DO with these geared turpoprop engines.

1) Never push the power levers forward beyond what is needed for taxi thrust unless the condition levers are in the FLIGHT position. If you attempt to take off with the condition levers in the TAXI position, you will melt the insides of the engines and have a difficult explanation to make to your Chief Pilot.

2) NEVER pull the condition levers back to lower than 96% while in flight. Doing so will almost immediately cause the failure of both engines followed by subsequent fire damage that is certain to get the attention of the regulatory authorities.

In the configuration manager, you can turn off "allow engine fires" to minimize such drastic outcomes, but we recommend leaving them available and learning to operate the engines realistically!

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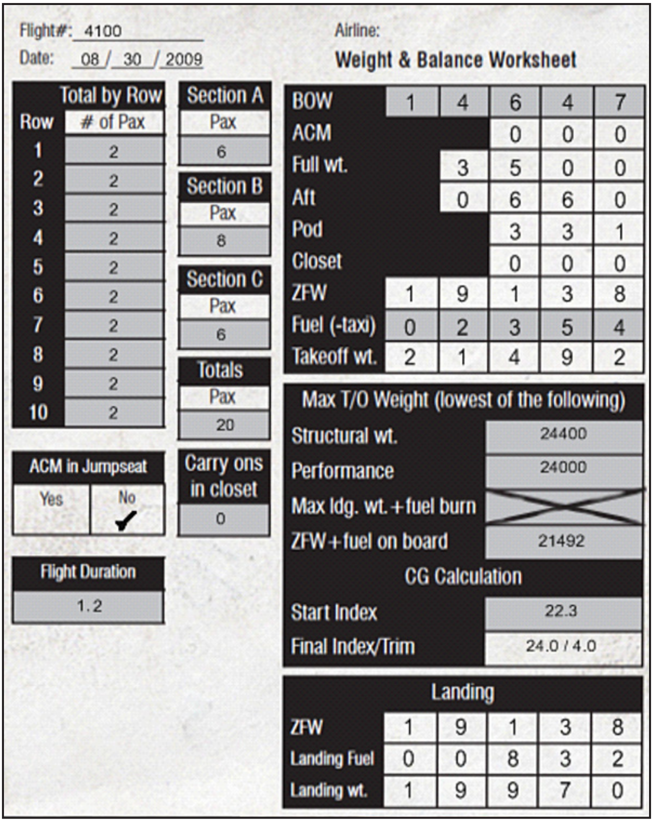
All Aboard!

If you look at the base of the captain's side window, you will notice a clip board with the aircraft loading sheet. One of the interesting new features that we have implemented in the PMDG BAe JetStream 4100 is the aircraft load sheet. This sheet is designed to closely approximate the functionality of the load sheet used by real world flight crews, although it has the added benefit of automatically doing the mathematical computations for you. Working with the load sheet is simple, but it might take you a few flights before you become perfectly comfortable with it.

You can display/hide this sheet by clicking on the spring-clip that holds it in place.



Flight#: 4100
Date: 08 / 30 / 2009
Airline:

Weight & Balance Worksheet

Row	Total by Row # of Pax
1	2
2	2
3	2
4	2
5	2
6	2
7	2
8	2
9	2
10	2

Section	Pax
Section A	6
Section B	8
Section C	6
Totals	20

Carry ons in closet
0

ACM in Jumpseat	
Yes	No
	✓

Flight Duration
1.2

BOW	1	4	6	4	7
ACM			0	0	0
Full wt.		3	5	0	0
Aft		0	6	6	0
Pod			3	3	1
Closet			0	0	0
ZFW	1	9	1	3	8
Fuel (-taxi)	0	2	3	5	4
Takeoff wt.	2	1	4	9	2

Max T/O Weight (lowest of the following)	
Structural wt.	24400
Performance	24000
Max ldg. wt.+fuel burn	
ZFW+fuel on board	21492
CG Calculation	
Start Index	22.3
Final Index/Trim	24.0 / 4.0

Landing					
ZFW	1	9	1	3	8
Landing Fuel	0	0	8	3	2
Landing wt.	1	9	9	7	0

Starting at the upper left corner, let's put some passengers on the airplane.

The passenger count column contains one row for each row of seats on the airplane. You can right/left click on each row to set the number of passengers you wish to have aboard the aircraft. Make an effort to keep the passenger load evenly distributed in order to avoid CG problems!

For now, let's place two passengers in each of the ten rows on the airplane.
You will notice that the column to the right of the passenger count column totalizes the passengers by "load zone" area. The load zones are designed to simplify the center of gravity calculations for the flight crew. You will notice also that the total passenger count is kept in the same area of the worksheet. ***You should now have 20 passengers on the airplane.***

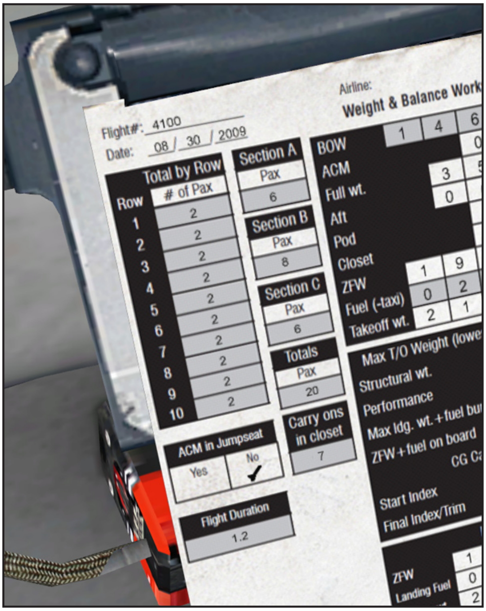
HINT: When you load passengers, bags and cargo onto the airplane via this load sheet, they appear in the passenger cabin if you have selected one of the external models containing passengers using the PMDG JetStream 4100 Configuration Manager!

Just below the passenger zone counts is a box to tabulate the number of carryon bags placed in the forward closet. Right-left click to set the number of bags as desired. Each carryon in the closet is considered to weight 10lbs for weight and balance purposes. ***Set the carry-on count to 7 for this flight.***

You can select YES or NO to include the weight of a cockpit jumpseat passenger by using the box titled ACM. (Air Crew Member) ***Select NO for the ACM in Jumpseat entry for this flight.***

On the lower left, right/left click to enter the figure that approximately describes how long your flight should take, in hours and tenths of hours. This figure is used to facilitate a landing weight calculation by multiplying an average fleet-wide fuel burn figure for the JetStream 4100. (Expected fuel burn should be 1000lbs / hour of flight time for flights of more than one hour. Fuel burn during shorter flights or flights with long climb segments will be higher, but 1000lbs makes for a good approximation.)
Set this figure to 1.2 hours for this flight.

The left side of your load sheet will now look like this:



Moving to the right hand column, we now need to adjust a few of the weights related to our flight.

The BOW (Basic Operating Weight) for the J41 simulated is equal to 14,647 lbs. As such, this number has been pre-populated to the BOW row on the worksheet. (This weight matches N328UE, formerly operated by Atlantic Coast Airlines and is typical of an empty JS4100.)

The ACM weight row will automatically reflect the correct weight if an ACM is sitting in the jumpseat (or not) based upon your selection in the ACM box on the lower left side of the sheet. This figure cannot be updated manually.

The next row, FULL WT totalizes the weight of all passengers aboard the aircraft. This number is derived from the passenger count manipulations that you made on the left side of the sheet. This number cannot be updated manually.

The next two lines, AFT and POD allow you to right/left click in order to establish the weight of cargo in the aft cargo compartment and baggage pods beneath the airplane. Typical weights for normal passenger flights are 600lbs for the aft cargo and 250lbs for the belly pod, so enter 600lbs to the aft cargo and 250 lbs to the belly pod by using right and left clicks to adjust the weight as necessary.

The weight total for the forward cabin closet is automatically populated based upon your selection on the left side of the sheet. Typical closet weights for the J41 are 60-90 lbs. This number cannot be updated manually.

The FUEL(-Taxi) row is where you will enter the amount of fuel aboard the aircraft at time of taxi, less 100lbs. This gives you the expected takeoff fuel quantity aboard the airplane at the time the power levers are advanced for takeoff. Generally speaking, flight crews use 200lbs when departing from large or congested airports and 100lbs when departing from smaller, less congested airports where it is anticipated that an immediate departure is likely.

To determine the number to enter here, look at the fuel quantity indicators at the base of the Engine Instrumentation System:

A bit of fancy Pilot-Math tells us that we have 2,354lbs of fuel aboard the airplane. Since we are leaving from a small airport, we can enter 2254 as our Fuel(-Taxi) in order to list the fuel weight we anticipate having on board at takeoff.

Slow Down or Go Down

The JetStream 4100 is an extremely well behaved airplane with very few dark corners to its personality. Control is balanced and stability is very good. Hand-flying the airplane is always a joy and with only a few exceptions the airplane rewards good airmanship. There are two personality quirks that you should remain aware of as you fly the airplane. One for passenger comfort, and the other to avoid pilot embarrassment:

First, flaps 9 produces a significant increase in lift produced by the wing. If you are flying along in stable flight and select FLAPS 9, the airplane will balloon dramatically. You can counter this quite easily by anticipating the balloon and putting forward pressure on the controls, but you will need to trim out the control forces to maintain level flight. The opposite is true when retracting from FLAPS 9 to FLAPS UP- you will notice a strong pitch-down tendency so be prepared and retrim the airplane as needed.

Now, the limitations section of the manual will tell you that you can select FLAPS 9 at 200 knots. A basic review of aerodynamics will tell you that the airplane's tendency to balloon at 200 knots with FLAPS 9 selected is going to be significantly stronger than at a slower speed such as 170 knots. I found that 170 knots was about the "Sweet Spot" for adding FLAPS 9 and it made the transition almost unnoticeable to passengers if you managed the controls effectively. At 200 knots, there was a noticeable pitch change that could be felt in the cabin.

Plan ahead on your flap configuration changes and your passengers will know you are a pro!

Speaking of planning ahead: Lets talk about slowing down the JetStream 4100. You will recall from the engine discussion that these engines are geared to the engine core and this presents some very unique operating characteristics. One of these unique characteristics is that when you pull the engines to idle power, you are still producing about 20-22% Torque, which means you are still producing forward thrust! Why would you want this?

Well, the worst thing you can do to a geared engine is to slow the engine down so much that the force of air moving through the propeller causes the propeller to exert rotational force on the engine.

Consider for a moment an engine that is producing no thrust whatsoever attached to a propeller that is moving through the air at 230 knots: What you have is a windmill where the propeller is driving the engine rotation. This is VERY bad for engine health and will lead to failure of the reduction gear in very short order.

To prevent this, the engineers have adjusted the engines so that they will always be exerting positive rotational torque on the propeller. The end result is that even when you pull the power to idle, you still have significant residual forward thrust!

This creates a behavior in which it can be very difficult to slow the JetStream 4100 while descending. The airplane will slow just fine in level flight, but even on a sedate descent such as a 3 degree glide-slope, the airplane will have a tendency to decelerate VERY slowly or even accelerate at certain weights. This means you need to plan ahead for your descents!

This tendency will not be very noticeable in cruise descents, but many JetStream 4100 pilots have found themselves high on an approach, too fast to get configured, and unable to slow down and go down at the same time. This can put you in a tough position because you need to get down, but you will be unable to be fully configured for landing 500' above the airport elevation, thus necessitating a go-around!

The technique that works best is to slow-down THEN go down. If you descend first you will accelerate and only multiply your problem as you get lower. If you slow down first, then nose the airplane over and descend fully configured with all the gear and flaps hanging out, you can SOMETIMES salvage the approach. So SLOW DOWN, then GO DOWN. You cannot do both at the same time.

When I was new to the airplane, a good friend and fellow J41 captain pulled me aside to share this piece of advice with me: If you can't get it to slow down, you won't get it to go down. If it doesn't look good, just get out of dodge and try it again. You can't save the approach once you are both high AND fast."

I share this advice with you because he was right!

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It is important to note here that in airline flying, you almost never take off with full fuel tanks. The proper fuel load for a J41 on an average stage length of 90 minutes will be somewhere around 2,000lbs depending upon the weather. A good "Rule of Thumb" for fuel planning is to plan for 1200lbs of fuel burn during the first hour of flight, then 1000lbs for every succeeding hour, plus 800lbs remaining in the tank upon landing.

In our case for this flight, we should need 800lbs landing fuel, plus 1200lbs for the first hour of flight, plus 200lbs for the 0.2 succeeding hours. This gives us 2200lbs of fuel required for the flight. It is important to note that we are not planning for any alternate fuel here, so if weather requires that you might fly a missed approach, you should add that fuel to your requirements as well!

If you need help planning your fuel, use this handy method:

Taxi Burn:	100	
First Hour of Flight:	1200	
Subsequent hours:	______	(multiply hours by 1000lbs)
Landing Fuel:	800	
Reserve need:	______	
Total Fuel Required:	______	(never less than 900lbs and never more than 5,818lbs.)

You will notice that the load sheet has performance limit numbers listed, as well as a CG calculation. The only number that will really concern us in the simulation world is the ZFW+fuel on board. The airplane should never weigh more than 24,000lbs at takeoff, so if you are extremely heavy you may not be able to carry sufficient fuel for longer distances.

Most often you will see this number become your limiting factor when you are flying stage lengths that exceed 2.5 hrs with a full load of passengers. In this case, you have to trade passengers for fuel to get your takeoff weight down below 24,000lbs!
We'll come back to Final Index/Trim and the Landing calculations at a later stage in the tutorial, so for now let's turn our attention to the FMS.

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FMS Preflight

We did the airplane loading slightly out of order for simplicity, but you should now be on page 38 of the Normal Procedures. It is time to get the FMS up and running. I will walk you through each step of getting the FMS initialized and ready for the flight to Washington. It is recommended that you take the time to read the FMS instructions in this manual, but this primer will get you most of what you need to know:

1) Turn the FMS on by pressing the ON button located at the center of the top row of buttons. After the power up self-test, you will be looking at a screen like this:

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2) Press the ENTER button three times to confirm that the airplane is located at KHPN. You will then be presented with the FLIGHT PLAN LIST page. This page will display a list of all flight plans originating from the airport you just selected. You can immediately load any flight plan displayed on this page or you can manually enter the flight plan item by item. To automatically load a saved flight plan, select the flight plan by pressing the associated line select key and pressing ENTER. Review the flight plan on-screen, then activate it by highlighting the SELECT> prompt that appears. (If you wish to create flight plans for the FMS, you can export them to the PMDG flight plan format using products like FSBuild or FSNavigator. You cannot use the default FSX flight planner to create flight plans for the PMDG BAe JS4100.)

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3) (If you loaded the saved flight plan in #2 above, please skip to #4 below)….

To manually string a flight plan rather than loading a pre-saved flight plan, press the FPL button when presented with the FLIGHT PLAN LIST page. This will take you to the ACTIVE FPL page. It is from this page that you will enter the flight plan to KIAD.

The flight plan for our flight today will be as follows:

KHPN, ELIOT, V39 to LRP, KIAD.HYPER2 ARRIVAL, KIAD.

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To manually string the flight plan, simply enter KHPN in the keypad. You will notice that the entry is placed in the yellow highlighted area on the ACTIVE FPL 1/1 screen as shown below:

Press ENTER twice to verify the entry, and move the prompt to the next line, where you will enter ELIOT as the next fix.

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Press ENTER twice to verify the entry, then enter the airway, V39. To do this, press the # key, then enter V39.

When you press ENTER, you will be presented with a list of fixes as shown below:

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You will notice that the FMS is prompting you in white text that reads SELECT ENDING WPT. What you are doing now, is to select the waypoint that will serve as your exit from this particular airway, V39. According to our flight plan, we are looking for LRP intersection, so we will need to press the PRV and NXT buttons on the side of the screen in order to scroll up or down. (PRV and NXT are the two middle buttons on the far left side of the FMS.)

In this particular case, we need to scroll UP to find LRP, so press the PREV button, and your screen should look like this:

Select LRP by pressing the line select key nearest to the fix, and the FMS will automatically populate all appropriate fixes between ELIOT and LRP.

HINT: When you select LRP, press the same line select key two times, and notice how the FMS moves between JOANE and LRP. This is how you will select between items in lists when there are more items in the list than there are line select keys, so remember this technique! Make sure you have LRP selected before proceeding…

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When you have LRP selected, press the ENTER key.

Next, enter KIAD as the destination fix.

Finally, select the STAR to be used for the arrival phase of flight. Do this by click on the line select key next to ARRIVE, and pressing ENTER. You will be presented with a screen similar to this one:

Click on the line select key adjacent to LRP, then press ENTER. You will then be presented with a list of arrivals that use LRP as their transition point. Select the HYPER2 arrival and press ENTER. You will be presented with a list of runway options that can be used when flying the HYPER2 arrive, so select RW01R and press ENTER to complete the arrival.

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The FMS will then show you a list of fixes along the STAR. Press SELECT to confirm adding them to the flight plan.

Don't forget to save your flight plan if you wish to use it again.

You can enter a Departure Procedure and select the departure runway using the same methodology. Select DEPART using a line select key, then press ENTER to confirm your selections. For this flight, use Runway 34. (Since this runway's departure procedure is a vector procedure, it will not be listed as available in the database.)

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4) Press the NAV key to bring up the navigation page of the FMS. KHPN, the first fix in the flight plan should be highlighted in yellow. Press enter twice to activate the navigation leg from KHPN to ELIOT. This will tell the FMS where to navigate FROM and TO.

5) Next, press the PLAN button along the top row of the FMS. This will bring up the flight planning pages. Press the line select key adjacent to the fuel numbers to highlight the RESERVE fuel prompt. Enter 800 in this area, then press ENTER. This tells the FMS that we want to land with a minimum of 800 lbs of fuel remaining on board.

6) Use the NXT button on the left side of the FMS to scroll down to PLAN PAGE 6. (Alternately, press the PRV button one time….) Enter the PAYLOAD being carried for this flight. You can calculate this number by looking at your load sheet and adding together the ACM, FULL WT., AFT, POD and CLOSET weights. In our case, you need to enter 4,420lbs to the PAYLOAD section of the PLAN 6/6 page.

After pressing ENTER, you will now see a GROSS WEIGHT displayed of 21,421lbs. You will note that this is 100lbs more than the TAKEOFF WT shown on your load sheet because we anticipate burning 100lbs of fuel during taxi!

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7) Next lets initialize VNAV so that we may use it simply later in the flight. Press the VNAV button, then highlight the DATA? Prompt on the lower left corner of the screen.

In the VNAV DATA screen, highlight the CRUISE ALT line, and enter 16000 and press ENTER three times to return to the VNAV screen. VNAV is now aware of our planned cruising altitude and will be better prepared to provide us with vertical profile assistance.

It is generally a good idea to go through all the fixes in VNAV screens by pressing the NXT/PRV buttons to scroll the entire flight plan. If you are fastidious, you can enter the planned crossing altitudes for the departure and arrival procedures if such crossing altitudes exist.

Press NAV to return to the main navigation page. The FMS is now initialized and ready for use.

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Time Check!

When you are comfortable with the airplane, you should have all of the above completed with about 15 minutes to go before departure time. This gives you an opportunity to review the weather one more time, verify the accuracy of your paperwork or close out any last minute details before you get into the rush of departure time. In the real world, the flight crew tends to get the loading information describing the passenger count and the cargo loads ten minutes prior to departure time, so for true realism you should wait until 1350 before working on the paperwork!

Page 36 resumes our use of the Normal Checklist by describing the Preflight Brief. Following is a sample preflight brief that you might give as a captain:

"This is flight XXXX and we are headed to Washington Dulles. I will be the pilot flying on this leg, and you will handle all pilot-not-flying duties. We'll adhere to company Standard Operating Procedures for the flight. If we disagree on any procedure during the flight, we agree here that we will use the most conservative of our two opinions and we'll look up the correct procedure once we are on the ground. I am listed on the paperwork as Pilot In Command of the flight, but we are equally responsible for the safe operation of the airplane, so if you see me doing something such as changing altitudes or headings and you do not know WHY I am doing this- you should assume I am wrong and question me immediately. You should never assume that I have more experience or a better understanding of the airplane or our navigation than you… If you move any switches outside of a normal flow or checklist, call the action out loud and explain why it is being done, this way we are both always aware of the current state of the airplane and all of it's systems…"

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We resume the Normal Procedures at the top of page 38. Since we have already initialized the FMS, it is not necessary to do so again. Enter the squawk code of 2235 into the transponder by pressing the line select key adjacent to the 1200 transponder code. This will place a yellow box around the code as shown here:

Using the outer knob on the Radio Management Unit (RMU) move the cursor to the position desired, and the smaller inner knob to change the number displayed. When you have completed entering the number, the RMU will automatically move the selection box back to the COM position, so no further action is necessary.

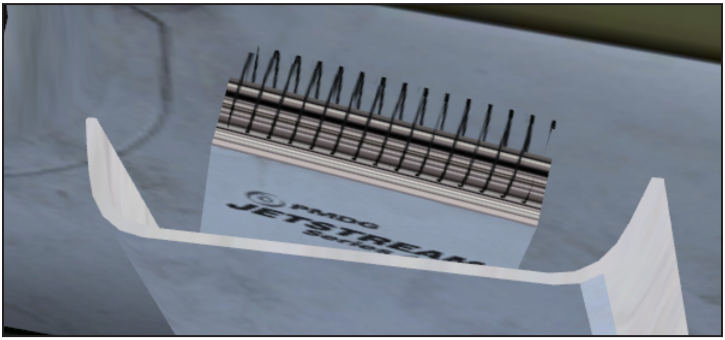
Giving Direction to Bugs

For our flight, we are planning to depart RW34 following the Westchester Two departure. This requires a climb on runway heading to 1000 feet, then a left turn to 295 heading and a continued climb to 3,000 feet. From there we anticipate radar vectors to ELIOT and a climb to our final cruising altitude of 16,000 feet.

Set the heading bug to our departure heading of 342 and the altitude selector to 3,000 feet.

HINT: Obviously in the real world, you would spin the altitude selector while watching the altitude displayed in blue in the upper right corner of your EADI. Since this is not possible in the sim, we recommend that you zoom in on the altitude knob before moving it. From this vantage point, you can see the altitude displayed on the First Officer's EADI while you are making your selection. Conversely, you can turn on Cockpit Tool Tips in FSX!

This is a good time to set the takeoff speed bugs. You will find that real aircrews will conduct this task at a myriad of different places, but since your workload will already be pretty high during taxi, let's go ahead and set them now. To determine what our takeoff speeds should be, you will need to pull out your speed-cards. The speed cards are located in the VC on the captain's side of the center console.



Clicking on the speed card set will cause them to move out to the center pedestal, where you can RIGHT and LEFT click on them in order to flip the pages as desired. You will notice that the weight for the current page is displayed on the bottom of each page. Since we weigh more than 21,000lbs, but less than 21,500lbs, we will flip forward (right click) until we see the 21,500 lbs page displayed.

Along the top of the page, you will see takeoff speeds for TAKEOFF and TAKEOFF IN ICING. Icing conditions are considered to exist if the Outside Air Temp is between -10 and +10C and there is visible moisture. (Raining, snowing or fog/mist present…)

Since our weather is nicer than that today, we will use the normal TAKEOFF speeds.

Setting the takeoff speeds is done using the IAS knob on the coaming panel.

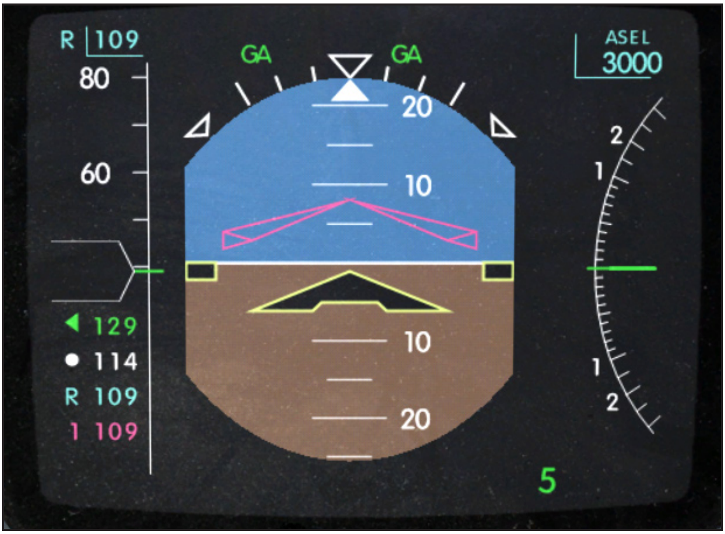
There are four speedbugs that can be set using this knob. You rotate the knob to select the desired speed as displayed on the upper left corner of the EADI, and then you push the button on top of the knob to move to the next bug in sequence.

The bugs are set for takeoff as follows:

Magenta:	V1	
Cyan:	Vr	***NOTE:*** These will be the same speed on this airplane
White:	V2	
Green:	Vyse	

Looking at the speed card for 21,500 lbs, you will note that the speeds to be set are 109, 109, 114 and 129 in order. You should set 109 first, the push the IAS button to move to the cyan bug, set 109, push the button to move to the white bug, set 114, etc.

When you are done setting the speeds, push the IAS button until the CYAN Vr bug is displayed on the upper left of the EADI as shown below. Note that you can see all speeds for each bug displayed on the lower left of the display.



When you are finished with the speed cards, left click near the top of the cards and they will stow back in the side pocket.

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Turn Check

It is now time to get the airplane completely configured for departure. Starting on page 42 of the Normal Procedures, follow along with the various tasks that are required.

Turn on the Seatbelt and No Smoking signs, then move down to the center console to set the pressurization controller to the landing field elevation. (Use 310 feet.) Adjust the power and condition levers as described, center the trims, and verify that the parking brake is set.

Final Departure Preparation

When you become more comfortable with the BAe JetStream 4100, this is normally where you will complete your paperwork items and the load sheet. Once you have them completed, you run through a flow that ensures the airplane is ready for the engine start procedure.

Before Start Check

At this stage, it is time to close the cabin door. Bring up the RAMP MANAGER by pressing SHIFT+2, then click to remove the pylons, the rope stanchion and the carry on bag cart. Click on the main entry door, and you will hear the door close and the door warning caption will extinguish on the CAP panel.

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When ready to start, you should have only the chocks and the Ground Power Unit visible in the Ramp Manager as seen below:

To get the airplane ready to start, move to the overhead panel and do the following:

- Turn both fuel pumps ON.

- Turn off both Avionics Switches

- Ensure both batteries are ON. (BAT lights will be illuminated when on GPU)

- Turn the BEACON and NAV lights ON.

- Turn the seatbelt and NO SMOKE signs ON.

Next verify that the batteries are on and have adequate charge, then that there is fuel pressure by examining the triple-gauges located above the EIS.

Next, move directly down the center of the main panel checking fuel pressure, check the EIS to ensure the engine EGT is below 200 degrees and that the proper fuel load is displayed on the fuel quantity indicators. Check the cap panel to ensure that there are no DOOR lights illuminated, now set the elevator trim to the center of the green band.

Lastly, you want to set the power levers in the proper position for the engine start. To do this, simply press the F2 key, the mouse or other device to back the power levers up until you see green REV lights illuminate on the CAP panel.

Now, using F3, the mouse or other device, move the power levers forward about ¾ inches ahead of where the REV lights extinguish. This is the proper start position for the power levers. (Pressing F1 will make this simple!)

We are now ready to start engines…

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Engine Start

For simplicity, we are going to start both engines on the gate. In the real world it is possible to start and taxi out on a single engine, but the workload for the crew is higher when starting an engine during taxi, and the FSX ground contact model doesn't lend itself well to such endeavors. Given that you are just learning the airplane, and given that you have to perform all duties on the flight deck, we would just as soon keep things as simple as possible!

The expanded Normal Procedure for engine starts begins on Page 50 of the AOM (Aircraft Operating Manual). I recommend that you read through the procedure once before commencing a start!

Since we will be starting the left engine first, select the START MASTER to the LEFT ENGINE as shown below:

Next, press the left engine START button. The engine start sequence will commence. You are primarily concerned with EGT during the start. You do not want EGT to exceed 770C, or the engine will be destroyed.

The Expanded normal procedure provides very good guidance as to what you should be watching for in order to see a normal start.

Once the left engine is stable, turn on the left generator, then bring up the ramp manager and remove the Chocks and the Ground power unit.

Repeat this procedure for the right engine.

After Start

Once started, run through the following steps on the overhead panel:

- Turn both fuel pumps OFF.
- Turn both Generators ON.
- Turn GPU switch OFF.
- Turn Avionics switches ON
- Turn Emergency Lights Switch to ARM. (Move guard first!)
- Turn Windshield Heat ON
- Turn Air Data Heat ON

Moving down to the center pedestal:

Rotate both FLOW selectors to 5.

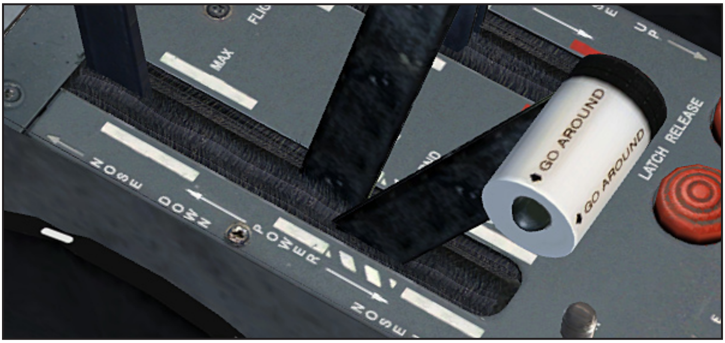
Now comes the part that will trip up many of your fellow new PMDG BAe JetStream 4100 pilots: The Start Locks.

I recommend that you pay close attention to the following paragraphs, as it will save you some misery later on in figure flights!

You may have noticed prior to starting the engines that the propellers on the J41 remain in flat pitch when shut down. On a free turbine engine like a PT-6, the props wind up in a feathered condition, with the edges of the blades facing forward. Since the TPE-331 engines are geared engines, start-locks are used to hold the propellers at fine pitch in order to reduce the drag induced by airflow as the propeller is rotated during the start sequence. Remember, the propeller and the engine core are directly linked in these engines, so we want to induce as little stress as possible on the gear mechanisms during the start.

Now that the engines are running, we need to remove the start locks so that you can have full command of propeller pitch. To do this, you SLOWLY move each power lever into reverse, one at a time.

I recommend that you move the power lever far enough after that the base of the lever is in the hatch-marked area on the pedestal as shown below:



Do this for both power levers, and the start locks should be removed without any problem.

NOTE: You will know the start locks have been removed when you hear the callout "Startlocks Removed!" We added this callout in order to help you get a feel for when they have been removed.

There is no indication of the start locks being removed- and this is important to note. If you fail to remove the start locks after engine start, you will discover the following things later in flight:

1) During takeoff, you cannot get Torque to exceed approximately 30%.
2) You cannot get much acceleration for takeoff, no matter how hard you push on the throttles.

If you realize you have left the start locks engaged in either or both engines, simply reduce the power levers to idle, then follow the procedure outlined above. Note that due to problems within the FSX turboprop engine model, FSX will attempt to run the engines up to full power in reverse if you leave the power levers just slightly after of the flight idle position. To avoid this, simply hit F1 to put the power levers on the idle detent where you want them.

(Anyone want to make bets as to how many forum posts we see on this topic? Help us educate your fellow pilots by pointing them to this discussion in the tutorial!)

You should now follow the after start flows as described in the Expanded Normal Operating Procedures. This will take you up to page 61 where we commence taxi.

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A (White Plains) New York Taxi

At this point you are ready to taxi.

Before we move, lets run through the items that are normally accomplished during taxi:

- On your EHSI display controller, press LNAV and MAP to bring up your moving map.
- ARM the spoilers.
- Uncage the standby attitude indicator by rotating the knob. (The pitch/roll cues will clear away.)
- Un-Mute the CAP panel.
- Set the flaps to NINE. (First detent)
- Press the Go-Around button (on the throttle)
- Press HDG and ALT SEL on the flight director.

Take a look around to ensure you are not in danger of hitting anyone, then release the parking brake and begin a slow, hard turn to your right to reverse direction and head toward the taxiway behind you. When you see the taxiway, turn LEFT to join Taxiway ALPHA and follow it to the hold short line at runway 34.

While you are taxiing, you have a few short flows that you would normally accomplish. We have covered the details with the brief flows above, but you can learn the proper procedure by following the procedures outlined on Chapter 4 page 61 and involve setting takeoff flaps, un-muting the CAP panel, verifying that the battery charge does not exceed 45 amps, and other duties.

One important item that is not included in the normal flows (because it is implied in the operation of the airplane) is to set your EHSI to the proper mode for navigation. If you wish to use the moving map, press the LNAV button on the coaming panel, then press the FULL/MAP button to bring up the map.

Departure Check

The departure check is completed when you receive clearance to enter the runway. It is a two part check. Part one takes place when you are cleared onto a runway, and part two takes place when you are cleared for takeoff.

If you are cleared for takeoff without any instructions to line-up-and-wait, then you accomplish both parts as one single activity. The dividing line between part one and part two is known as THE LINE and appears on the checklist.

When cleared onto the runway, you should check that the flight controls are free (CHECK THIS! If you have the gust lock engaged, you will be in for a surprise! The gust lock is on the FO's side of the center pedestal and should be removed during taxi!) Next, push the TOCWS test button on the First Officer's side of the panel. This will tell you if the airplane is properly configured for takeoff. If you do not get a warning tone, then you are all set to go!

Set the transponder to 1 TA by pressing the line select key adjacent to the OFF flag, then rotate the large knob on the RMU until you see 1 TA displayed in the window.

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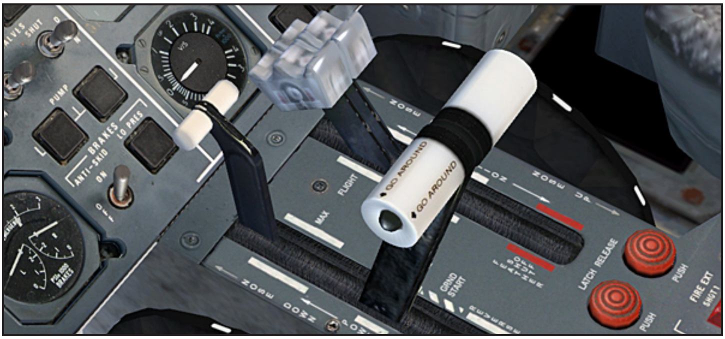
Next, select the engine anti-ice as needed for takeoff (see previous discussion of icing takeoff requirements when setting the takeoff speeds) and then bring the condition levers to their full forward FLIGHT position.



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When the condition levers are brought to FLIGHT, you will hear the engines increase in RPM, and you will hear the callout "Condition Levers Flight." Before bringing the power levers up, you should see a display that looks something similar to the following image:

Note that engine RPM will be someplace between 96% and 100% depending upon atmospheric conditions.

As you enter the runway, turn all the aircraft lights on for increased visibility in crowded airspace.

Engine Operating Procedures

As mentioned before, the TPE331-14 engines have some very specific operating parameters that you will want to be careful of. Takeoff is not simply a matter of pushing the throttles up and expecting the engines to give you all the thrust you need.

This section will give you a primer on how to successfully operate the TPE331-14 engines so that you do not "make metal" by melting the engine cores and causing uncontained fires or failures!

Before we take off for the first time, I want to walk you through a typical engine operating procedure for an entire flight. Once you have done this a few times it will become simple, but at first it might not be clear why each step is necessary.

Ground Operations: When operating the engines on the ground, we always leave the condition levers in the TAXI position. This causes the engines to operate at 72% RPM and around the 460 degree range EGT.   You can taxi with only slight power applications, and at most weights you will only need a tap of the brakes now and then to slow the airplane down.

Special FSX Consideration: *The turboprop model contained in FSX is hopelessly broken. In order to simulate a geared turboprop engine, we do a significant amount of manipulation of the FSX engine model behind the scenes. Unfortunately, there are a few things we cannot prevent- and one of them appears in the taxi behavior if you attempt to go into BETA range for reverse thrust. If you move the power levers back just slightly into BETA, FSX will attempt to run the RPM and fuel flows through the roof. This is not a normal behavior of a geared turboprop, so the best way to avoid the problem is to go a bit further into beta, or to hit the F1 key to set the throttles firmly on the idle balk.*

Takeoff Operations: For takeoff, you will advance the condition levers fully forward into the FLIGHT position. (CTRL+F4 works marvelously!) Once RPMs have stabilized you should expect to see 96%-100% RPM displayed on the EIS.

Advance the throttles slowly but firmly forward. You now need to watch for one of three things to happen:

1) Torque exceeds 100% before the throttles are fully forward. This is most likely to happen on very cold days. When you reach 100% Tq, leave it there! Do not use any value above 100% even if you can get it by advancing the throttles further. (This is called "Torqueing Out.")
2) EGT hits the redline before the throttles are fully forward. This is most likely to happen on very hot days. When you reach the EGT limit, stop advancing the throttles and make minute adjustments to ensure you do not exceed temperature limits. (This is called "Temping Out.")
3) Throttles go fully forward with no Torque or Temperature limit problems. This will happen most of the time. Once your throttles are fully forward- you have the most power you will get from the airplane.

Now you are probably wondering: Why happens if I advance the throttles for takeoff without bringing the condition levers forward? The engines will react harshly, and will very quickly produce molten metal as a result of over temperature conditions.

One word of warning: If you see the digits on Torque or Temperature highlighted with a green background, it means that you have an exceedance on your hand and you should pull back on the throttle position immediately!

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Following is an image of the EIS taken shortly after takeoff:

Note that Torque in this image is less than 100%. This is normal and as the airplane climbs, Torque will continue to fall because the thinner air makes it easier for the engine to rotate the propeller.

Next you will not that the EGT is right below the limit displaced in orange digits just above the EGT gauges. This is normal for takeoff power.

Lastly, notice that the RPM is at 100%. This is also normal for after takeoff.

Climb Operations: After takeoff when you have the gear and flaps up, you will want to reduce the engine RPM to 98% for the climb. You will do this by pulling back just SLIGHTLY on the condition levers while monitoring RPM on the EIS.

Since reducing RPM is going to reduce the mass-flow of air through the engine, it stands to reason that the engine core will become significantly hotter as the RPM slows. ***For this reason, we must very carefully manage the power setting BEFORE we reduce the engine RPM.***

The engineers at BAe have made this very simple for pilots to manage. You will notice on the EIS that the EGT displays have a series of white hash-marks located on the arc of the dial. The lower of the two hash marks is where you want to match your EGT needles before you roll the RPM back to 98%, as shown in this image:

To bring the EGT levels back to the lower white hash mark required just a slight reduction in the power lever setting, as is seen by comparing the torque readout from this image to the previous image.

Once the EGT has been set to the lower white hash mark, it is time to roll the RPM back to 98%.

You will notice that the RPM gauges are delineated in 1/10th of an RPM. The gauges are this precise- and accuracy is important! We recommend using CTRL+F2 to just gently creep the RPM backward until it reaches around 98.3, then, using the mouse, just move the condition lever one tiny step backward and you will notice the RPM settle on 98.0 very nicely.

When the RPM reduction is made, you will notice that the EGT has risen back to the EGT limit almost by magic! The engineers at BAe knew that pilots are always looking for a simple shortcut, and this method of EGT adjustment fits the bill perfectly!

Right after this reduction, you may notice that there are two green lights at the top of the EIS that occasionally illuminate. These lights are there to let you know that the Torque and Temperature Limit system is adjusting fuel flow to the engines to keep them from running over the Torque or Temperature limits. A quick scan of the gauges will tell you which limit you are bumping up against, and in our case here it is the Temperature limit.

Closer inspection of our EGT will usually reveal that the temperature is right against the EGT limit line, so the engineers have added a second white hash-mark that we can use to properly set temperatures after the power reduction. If you gently adjust power so that the EGT needle is centered on the upper white hash mark, you will have perfectly set your power for optimum performance.

IMPORTANT NOTE:

You will almost never see 100% Torque while flying. Torque will decrease with altitude. This is all normal!

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Advanced Takeoff Operations: When flying the J41 for an airline, we had a very complex book located in the cockpit that our airline spent tens of thousands of dollars to obtain. This book gave us "Reduced Torque" settings for takeoff based on individual airports, runways, temperatures and weight configurations. For those interested in the geek details of such things, a pattern developed in which we noticed that our airplane could predict the proper setting for a reduced torque takeoff nearly perfectly without using all the fancy tables. (We still used them, however!)

This technique called for setting takeoff power using EGT as the primary indication of proper power setting. We would advance the throttles, and bring the power up only until the EGT needle matched the lower white hatch-mark described in the section above. Once at this hatch mark, we would leave power where it was, or rarely adjust it slightly to make the reduced torque number predicted by the book. In nearly all cases, this temperature setting was the result of using a properly calculated reduced torque.

This power setting on takeoff had the added advantage of reducing the number of movements required in order to set climb power. Rather than reducing power, reducing RPM and tuning power, we simply reduced RPM and tuned power.

It might seem almost inconsequential, but in busy airspace workload reduction was always a priority.

Cruise Operations: During the climb to altitude, constantly monitor your EGTs. They will change during the course of long climbs and it is important to keep them adjusted as described above throughout the climb.

As mentioned before, Torque will decrease as you gain altitude, this is completely normal.

For cruise, our airline left the RPM at 98%. Some airlines provided guidance to reduce the RPM to 96% in order to save fuel and reduce core temperatures in the engines even further. You can choose whichever you like for your cruise setting, but be mindful that before you reduce RPM, you must reduce power or you will experience an over-temp condition as the RPM slows!

Anti-Ice Effects: I have already mentioned that slowing the RPM of the engine reduces the mass-flow of air through the engine, and causes the EGT to rise. So it will not surprise you to learn that turning on the Engine Anti-Ice system (which uses bleed air to heat the engine inlet scoops) will have the same effect.

Icing conditions are defined as "visible moisture while temperatures are between +10C and -10C. In other words, you will hit icing conditions while climbing through clouds in the summer time beginning around 8,000 to 10,000 MSL. In the winter time, the freezing level will be lower!

In these conditions, it will be necessary to turn on the Engine Anti-Ice. When you do, airflow will be diverted from the engine to the inletscoops for heating. This reduction in airflow will cause an increase in EGT. So….

Before you turn on the Engine Anti-Ice- pull the power levers back just a tiny bit!
You may find that at heavy weights in summer time, climbing through high cloud layers or navigating lines of thunder storms while trying to climb with the engine anti-ice on results in anemic climb rates. This is the reality of life as a turboprop pilot and explains why so many of us became so proficient on instruments!

Descent Operations: Descent operations require no special handling beyond what has already been discussed about monitoring EGT. RPM changes are not required during descent.

Landing Operations: Approaches are normally flown with the RPMs at 98% until configuring to land. There is no scientific method for when to set the condition levers back full forward, only that it be done before the airplane is committed to land. Generally speaking on VMC approaches, we would bring the condition levers forward somewhere between 1000' and 500' AGL as part of the landing checklist. On complicated instrument approaches, the technique was to bring the condition levers forward before configuring for the final descent in order to minimize the drag/thrust change caused by the RPM change.

The choice is yours!

You will leave the condition levers fully forward until you have slowed the airplane to taxi speed and are turning off the runway and no longer in need of engine reverse thrust for braking. Once you have reduced power to idle and are preparing to turn off, bring the condition levers to TAXI to reduce RPM back to 72%.

NOTE: Once again I want to point out the broken FSX turboprop model behavior in reference to BETA operations on this simulation. You will get good, realistic BETA by bringing the props modestly into reverse thrust. When done with reverse, we recommend hitting the F1 key to restore the throttles to the idle position because this will minimize disruption caused when FSX attempts to run the RPM and fuel flow up if the power levers are slightly in the reverse range. On the real airplane, the technique was the leave the power levers just slightly in beta to slow the airplane gently during the turnoff, but this technique doesn't work effectively here because of the FSX turboprop model…

Ground Operations: Once clear of the runway, you should have the condition levers in the TAXI position, and head on into the gate.

Shutdown: This is one area we are betting is going to bite a few new PMDG BAe Jet-Stream 4100 pilots. When shutting down TPE331-14 engines, you must be mindful of the startlocks that hold the propeller blades at a flat pitch when the engine is not running. These start locks reduce the wear and tear on the starter motors be reducing the drag that the engine must overcome while spinning up to speed with feathered propellers. In fact, if you attempt to start the engine with the prop feathered on the ground, it is likely that the start will fail or that you will damage the engine.

To get the propellers back on the start locks is EASY. You just have to remember to do it!

After hitting the STOP buttons, wait for RPMs to drop below 50%, then pull your power levers all the way back into beta. This can be done by pressing F2 and HOLDING it while the engines spin down, or you can pull the handles back using the mouse in the VC. Some of our beta testers have successfully programmed their hardware with a button to mimic the F2 stroke. However you decide to get the power levers into reverse is up to you, but just remember to do it!

You will know the engines are properly on the start locks when they look like this:

Should you forget to put the props on the start locks, you will want to quickly remedy the situation in order to avoid impinging your reputation as a pilot. To do so, simply pull the power levers to their full beta position, then press the UNFEATHER PUMP switch in the direction pointing toward the engine you need to re-set. This will put the prop back on the start locks.

(It should be noted that the unfeather pump in the real world takes a very long time, and normally requires the involvement of your First Officer to monitor the prop from outside the airplane until he hears the locks click into place…. Fewer phrases are more hated by J41 Captains than, "you mind stepping outside to give me a yell when the locks are good?")

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Takeoff

Takeoff in the PMDG BAe JetStream 4100 is not much different than any other airplane. Rotate the airplane at V1/Rotate speed of 109 knots as per our speed cards and weight for this flight.

The proper technique for takeoff is to rotate slowly until airspeed stops increasing. You should see approximately 12 degrees nose attitude. You will hear a "positive rate of climb" call and at this time you should retract the landing gear. While the gear is retracting, the airplane is going to want to accelerate, but you should continue to use pitch to keep speed from increasing until you are more than 400' above airport elevation. At this point, pitch down to approximately 10 degrees and retract the flaps. This technique will have you making your initial climb at approximately 135-145 knots until the pitch-down and flap retraction sequence.

The JetStream 4100 gets a significant lift boost from having the flaps at the 9 degree position, so retracting the flaps to UP is going to give you a strong nose-down tendency. Anticipate this, and use a combination of pitch control on the yoke and elevator trim to damp out the change.

As you climb through 800', set the heading bug to 295 degrees, and continue to modulate your pitch until you see 170 knots. At 170 knots, press the IAS button on the flight director. This will command the flight director to give you pitch commands to maintain 170 knots in the climbing turn to 295 degrees.

This is a good time to reach down and turn the autopilot ON. The autopilot control head is located on the center pedestal and pressing the ON button will activate both the autopilot and the yaw damper.

As soon as you have the airplane on autopilot, rotate the altitude selector knob until it reads 16,000 feet, then make certain your are in HDG, ALT SEL and IAS modes.

Now that we are climbing away, it is time to set reduce engine RPM to 98%. Bring the power back so that your EGT matches the lower hatch-mark, adjust RPM and fine tune your power as discussed in the previous section.

Climb

Now that we are established in the climb and heading west toward the Hudson river, reach over to the FMS and press the DIRECTO button. The D-> button is located on the left side of the FMS, and will display a list of fixes along the programmed route of flight from which to choose.

The next fix along the route of flight will always be highlighted, which in this case makes selection simple. Hit the ENTER key, and the FMS will plot a course directly from our current position to ELIOT.

Next, press NAV on the flight director, and the airplane will begin to track the LNAV course toward ELIOT. LNAV will be displayed on the EADI as shown below, and information about our next fix, track, distance and current ground speed is displayed on the EHSI.

Climbing through 10,000' MSL, it is safe to douse all the external lights except the NAV, BEACON and STROBE lights. Generally if you expect a smooth flight, this is an opportune time to turn off the fasten seatbelt sign as well!

The remainder of the climb consists primarily of monitoring the airplane. (Watch your EGTs, especially if you have to turn on the engine anti-icing!)

This is a good time to explain a few functions of the autopilot. The altitude button on the flight director controls both altitude select mode (ASL) and altitude hold mode (ALT) through a single button. The system defaults to the fact that it expects you to use the ASL mode while in a climb or descent.

To do this, press ASL, then select either V/S or IAS as your pitch mode to manage the climb or descent. V/S mode is pretty self explanatory, but I have a few cautionary notes on IAS mode. This airplane is not a VNAV & Autothrottle airplane, so you are going to have to be smart about using the IAS mode.

IAS mode will not keep you from stalling the airplane in a climb if you ask it to do something the airplane is not capable of. For example, asking it to maintain a speed of 100 knots will get you in trouble. Likewise asking it for a speed close to the 250 knot limit will cause extremely aggressive and sometimes erratic behavior. In fairness, the F/D on the real airplane is less twitchy than the one in this simulation, but it still wasn't perfect when commanding 240 knot descents!

The proper technique for setting IAS pitch mode in a climb is to manually pitch the airplane to the desired speed, trim the airplane, then select IAS mode on the flight director. If you engage the autopilot and select IAS mode while the airplane is significantly out of trim, you are going to disappoint your passengers!

One other note on managing the V/S and IAS pitch modes: When you select either of these modes on the flight director, the mode will activate at your current V/S or IAS. If you want to change the selected V/S or IAS displayed on the lower right of your EADI as the target, you must use the "thumb wheel" to make the adjustment.

The thumb wheel is located on the center pedestal on the autopilot control head.

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The thumb wheel functions like a trim wheel, which means that it is intuitive in the V/S mode, but not so intuitive in the IAS mode. When rolling the thumb wheel, the number displayed on your EADI's lower right corner will change to reflect the V/S or IAS setting you have selected. This is often times not convenient in a virtual cockpit environment because it is not in a good position to "reach and watch" at the same time, so we have three recommendations:

1) Using the space bar and mouse in combination with zooming, you can get a good view of the wheel and the lower right corner of your EADI at the same time.
2) If you activate tooltips in FSX, the tooltip will display the current value.
3) We have created a 2D popup of the autopilot control head that you can reach by using SHIFT+3.

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Cruise

Level at 16,000' is a typical altitude for the JetStream 4100. This means that you are going to run across all manner of weather. Don't forget to keep an eye on your EGT, and remember that if it becomes necessary to turn on the Engine Anti-Ice, reduce power slightly first.

You can monitor the progress of our flight by watching the fixes roll by on the EHSI. This EHSI is not as sophisticated as many of the Boeing and Airbus airliners, but it does get the job done very effectively. I recommend that you play around with the various screens and settings, but be careful of one thing: If you take the screen away from an LNAV screen while in NAV mode, the airplane will stop tracking the LNAV flight path! This might seem like a weakness in the system, but the reality is that we rarely used anything other than the moving map, so it wasn't much of a factor in flight.

Take some time to explore the display settings available using the EHSI display controller:

We'll get into some tricks on the display controller as we set up for the approach.

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Descent Planning

As we cross BOYER, it is time to begin thinking about our arrival at KIAD. Pull out the speed cards once again, and consult the load sheet on the captain's clip board. According to our calculations, we should be landing at 19,840lbs. Since we always round up with weight, flip the speed cards to the 20,000lbs card, and set the flap speeds for non icing conditions. As a matter of review, we have four speed bugs, Magenta, Cyan, White and Green. Set the speeds of 123, 108, 110 and 125 respectively, then push the button-center until the cyan bug (108) is displayed on the upper left corner of the EADI. This is your VREF speed at which you want to touch down. The magenta TARGET speed of 123 is the speed at which you will want to fly the approach.

Looking at the HYPER2 arrival, there are a number of crossing restrictions that we must contend with on the arrival, so this is a good time to program them into the FMS. I should point out that it will still be our responsibility to navigate them, but having them in the FMS will serve as a good reminder of our crossing altitude requirements. Press the VNAV button, and on the VNAV 1/3 page, then use the PRV/NXT keys to scroll up and down the flight plan.

You may need to scroll down to see the fixes ahead of us if you are already along in the flight plan during the flight. Scroll up or down as needed until the fixes still to be flown are shown on screen.

Refer to the HYPER TWO ARRIVAL included with this tutorial to find the altitudes for each of the fixes on our arrival into KIAD.

Using the line select keys on the right side of the keypad, highlight the altitude entry line for MULRR, and enter 8000. Press enter, then select SIGBE and enter 7000, then MOWAT and 5000, then HUSEL at 4000 and YACKK at 4000.

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Return to the VNAV 1/3 screen using the PRV/NXT buttons, and you will see a screen that looks similar to this:

Notice that the FMS is giving us a "RANGE" to Top of Descent (15 miles in this screen capture) and is estimating a descent rate of 2000 fpm in order to make our descent projections. These pieces of information are helpful when planning a descent, especially when the crossing restrictions are required as they are on the HYPER 2 arrival.

You can see the route of flight and the fixes laid out on the NAV display. Note that on this airplane, on the next fix on your flight plan shows a name, and the flight path is always white. Future fixes are shown in white but do not display their names.

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If you wish to adjust the range of your moving map, you can do so by using the range arrow keys on the radar display. (Yes- the radar is non-functional- but give us time, we're working on it…)

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Descent

As you approach the top of descent, set your altitude to 8000 using the large altitude knob. To initiate the descent, I generally recommend one of two methods:

1) Press ALT on the Flight Director to activate Altitude Select mode, then press IAS. The IAS will be displayed on the lower right of your screen in cyan. SLOWLY begin creeping the power levers back just a little bit at a time and the airplane will begin to descend at your current airspeed. The more power you remove, the faster the rate of descent. The trick to descending in IAS mode is that as you descend into denser air, the airplane will tend to descend more slowly, so you must constantly manipulate the power levers in just tiny increments to keep the descent rate you need.

2) Press ALT on the Flight Director to activate Altitude Select mode, then press V/S. The V/S will be displayed on the lower right of your screen in cyan. SLOWLY begin dialing the V/S number into lower and lower negative numbers until you have gradually gotten the descent rate you desire. As you do this, continually creep the power levers back to avoid overspeeding the airplane.

Even though we have the fancy FMS to help us do the math, I always found that it was convenient to keep the descent math going in my head in order to make sure the approach path would work. To figure out if your descent rate will work, simply divide your ground speed by 60 knots to get the "miles per minute" at which you are traveling. Then, divide your descent requirement by the current descent rate- so, if we have to descent 8,000 feet at 1,000/min, we know we need 8 minutes to descend. Multiply this time by the "miles per minute" and that tells you how far out you must start your descent.

So, in this case, if we wish to descend at 1,000 fpm from 16,000 to cross MULRR at 8,000, we know we will take 8 minutes in the descent. Our ground speed will be approximately 240 knots during the descent, so we'll travel 4 miles per minute, which means we must start the descent 32 miles from MULRR to have reach the required crossing altitude on time.

See? Who needs the fancy FMS!

As you approach 10,000' MSL on the descent, turn on the CONSPIC LIGHTS and, if at night, the tail illumination in order to increase visiblilty. Now is a good time to active the fasten seatbelts sign as well.

Potential Dangers: This is not an autothrottle airplane. As the airplane levels out, especially after a long descent, you MUST remember to bring the power back up or you risk stalling the airplane.

Flying the HYPER TWO: As you cross MOWAT (right on your altitude of 8000'!) the airplane will being the turn to follow the arrival toward SIGBE. Once you make the turn, dial 7000 into the altitude window, and descend in time to cross SIGBE at 7000.

Once you cross SIGBE, set 5000 in the window and descend to cross MOWAT at 5000 as assigned on the STAR.

For this tutorial, we will fly the ILS 01R at KIAD. To insert the approach into our flight plan, press the FPL button, and then access the APPROACH prompt near the bottom of the page. On the page displayed, highlight RW01R and press ENTER to select the runway. Once the runway is selected, you will be presented with a list of possible approaches to the selected runway, select ILS in this case and press ENTER.

Finally you will be presented with a TRANSITION fix. You generally should consult an approach plate in order to pick the correct transition fix. In this case, select MOSBY, and press ENTER. The FMS will then display a list of fixes on the approach (MOSBY and TILLE.) Highlight SELECT? If it is not already highlighted in yellow, and press ENTER. The fixes for the ILS approach to RW01R will now appear in your flight plan.

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Now this is a good time to get the radios set up for the ILS to KIAD/RW01R. The approach plate is included in this tutorial, so you will find that the frequency of 110.10 will need to be dialed into the Radio Management Unit. You do this by pressing the button adjacent to the standby frequency in the RMU, then dialing in 110.10 as shown here:

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Once you have the frequency dialed in, press the SWAP button adjacent to the active frequency (in white) and the 110.10 will be moved to the active frequency.

Next we must set up the ILS inbound course so that our autopilot will know the correct final approach course. To do this, press the V/L (VOR/LOC) button on the display control panel ONE TIME. (Do not press this button twice, or you will change the autopilot to VOR/LOC mode, which we do not want to do just yet!)

When you press the button, you will see a magenta colored localizer course selector appear on the moving map display as shown below:

This magenta course needle can be adjusted by using the CRS knob on the coaming panel. (Each pilot has his/her own course knob to control the CDI on that pilot's side of the cockpit. Left for Captain's Nav 1 and right for copilots Nav 2.)

The magenta course selector needle will remain displayed for FIVE SECONDS unless the CRS knob is being manipulated. Once the course knob ceases being used, the magenta need will remain for five seconds. If it disappears, just hit the V/L button once again to make it appear.

Using this technique, set the course needle to 011 degrees for the inbound course to the ILS 01R at KIAD. The course needle will then declutter. This is normal.

When we arm the autopilot for the approach, the airplane will automatically bring up the VOR/LOC screen and transition the autopilot to LOC/G-S tracking if we have the flight director set up for the approach. It is important to understand that the FCS Control switch that reads PILOT or COPILOT is telling the autopilot which settings to use for the approach transition: Captain or First Officer.

So make certain that the pilot flying the airplane is displayed on the FCS switch next to either pilot's EADI!

Continuing the descent along the STAR, after MOWAT, set 4000 in the altitude selector and descend the airplane to 4000' MSL before reaching HUSEL as you have been doing.

As you approach YACKK, let me caution you about speed control in the PMDG BAe JS4100. This airplane is not fond of slowing down while in the descent. This comes from a couple of factors, one being a good wing, the other being that TPE 331-14 engines do not like negative torque. Negative Torque is a condition where the engines are running very low power, so the airflow hitting the props is essentially forcing the engine to rotate at a faster RPM than the throttle setting is calling for. Such torque can destroy the engine very quickly, so the engineers have limited how far you can pull the power back.

You will notice that in level flight, pulling back the power to the idle stop still provides around 22% torque. That is a lot of thrust while at "idle power."

So be warned, slow down early- or you'll have to go-around!
After crossing YACKK, slow the airplane to 190 knots. This wil take about 55% Torque in level flight to accomplish.

When TICON is about 10 miles in front of you (adjust the range of your display) select FLAPS 9. Note that the autopilot will have to make a big trim adjustment because of the large lift boost at Flaps 9. If you are hand flying, be prepared for this! (Yes- the autopilot will chase the altitude hold if you deploy flaps 9 at high speeds. I generally tried to wait until around 170 knots before going to FLAPS9 as it reduced the ballooning tendency…)

When five miles from TICON, set 50% Torque and the airplane will slow to 170 knots. Once slowed, set 3000 in the altitude window and descend to that altitude.

LNAV to ILS Transition: Crossing TICON the airplane will turn to follow LNAV toward MOSBY. When the airplane initiates the turn toward MOSBY, press the APR button on the flight director one time. This will arm localizer and Glide Slope capture on the flight director and you will see the white LOC armed mode appear on the EADI.

As the ILS comes into field, the moving map will be replaced by an HSI display pre-set for the ILS 01R final approach course of 011 degrees as we'd specified earlier on the approach. (Pretty nifty, eh?)

LNAV to Vectors to ILS Transition: If your approach controller takes you on a vector, simply dial the heading into the heading bug and press the HDG button on the flight director controls. The airplane will turn to follow the heading bug. If you are being vectored onto an approach, you should press the NAV or APR buttons ONE TIME to arm them to capture the LOC/ILS when it is available. When not navigating in LNAV, pressing the V/L button will bring up the HSI course needle on the EHSI.

All Approaches: You do not want to start down the glideslope without some drag hanging out to keep the airplane from accelerating. Generally speaking you want to transition to GEAR DOWN, FLAPS 15 as you capture the glideslope on an ILS. Bring the power back and slow to 140 knots so that you can configure to FLAPS 25.

Fully configured at Flaps 25, you will need a Torque setting of between 27 and 30 to maintain your green bug target speed while coupled to the ILS. Try not to make large power adjustments, just make small changes and let the airplane respond to them.

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Coming through 1000' MSL, your displays should look similar to this:

Fully configured on LOC and GS, you should see a descent rate around 700 fpm and you should maintain your magenta bug speed all the way to 200' AGL.

Descending through 200' AGL, press the autopilot disconnect button TWO TIMES to disconnect the autopilot and the yaw damper. Begin bringing the throttles back gently to idle, and with only a slight flare you should touch down at your blue ref-bug speed.

Lower the nose gently to the runway, and select only as much reverse thrust as you need. As you go into reverse, the spoilers will deploy and the green spoiler light will illuminate on the coaming panel.

As you slow through 70 knots, bring the power to idle, (F1 key helps!) and brake normally. When slowed to around 50 knots, bring the condition levers to TAXI (CTRL+F2) and make the next available turnoff you see.

Taxi and Shutdown

During taxi in, retract the flaps, mute the CAP panel, cage the standby attitude indicator, set the spoiler selector to OFF and reduce the external lighting to what is necessary for taxi. When have reached your desired parking gate, set the parking brake, then conduct the shutdown flow as follows:

Center Pedestal:

Flows OFF

- Overhead Panel:
- Avionics Switches OFF
- Emergency Lights Switch: OFF
- Anti-Ice Switches: OFF
- Generators: OFF
- Engine Stop Switches: Un-guard and Press STOP.
- Power Levers: FULL BETA when RPM less than 50%.

You can use the ramp manager to make certain that you have a ground power unit available, and any other ground equipment that you may desire upon landing.

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Grab Coffee and Start Over!

The PMDG BAe JetStream 4100 is a true commuter airplane, so you shouldn't expect to be here at KIAD for very long. :45 is generally the norm, and your next flight may take you back to the NY Metro area, Greensboro, NC or any of a myriad of places in between.

This tutorial has only given you the very basics on how to operate the airplane, and we hope that you will dive into the manual to learn more about the airplane and how turboprop commuters are flown. You will get the most benefit from spending time going through the Normal Procedures line by line, following along on a flight of your choice!

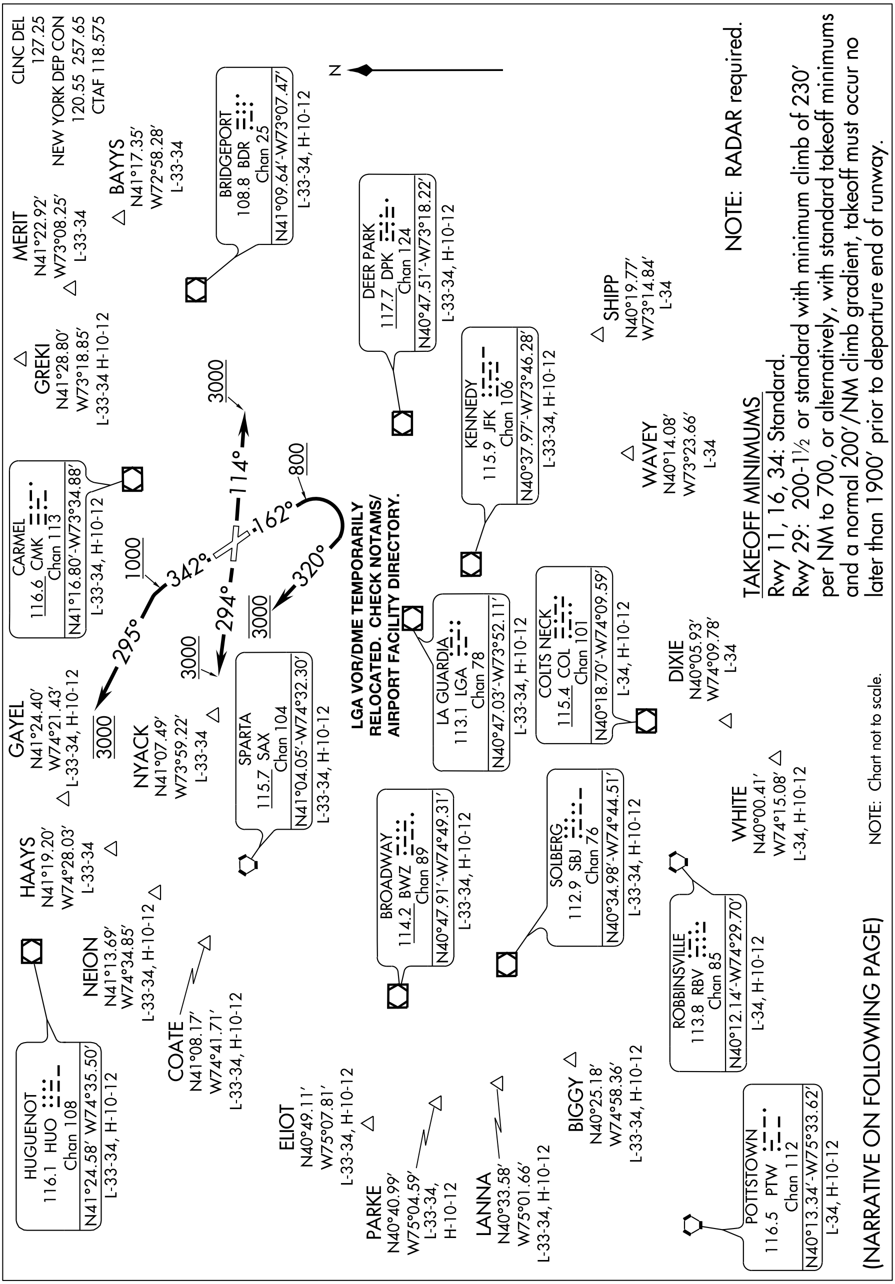
However you choose to do it, please know that there are many other flight sim enthusiasts out there who are available to help you learn and share in your experiences, and we always enjoy having you stop by our forum on AVSim to share your stories.

On behalf of all of us at PMDG- thank you!

· *END* ·

WESTCHESTER TWO DEPARTURE

WHITE PLAINS, NEW YORK



WESTCHESTER TWO DEPARTURE

WHITE PLAINS, NEW YORK

DEPARTURE ROUTE DESCRIPTION

TAKE-OFF RUNWAY 11: Climb heading 114° to 3000 feet. Thence....
TAKE-OFF RUNWAY 29: Climb heading 294° to 3000 feet. Thence....
*TAKE-OFF RUNWAY 16: Climb heading 162° to 800 feet then turn right heading 320°, maintain 3000 feet. Thence....
TAKE-OFF RUNWAY 34: Climb heading 342° to 1000 feet then turn left heading 295°, maintain 3000 feet. Thence....

.... via vectors to assigned route/fix. Expect clearance to filed altitude/flight level 10 minutes after departure.

*NOTE: Do not exceed 190 KIAS until established on heading 320°. Advise clearance delivery if unable to comply.

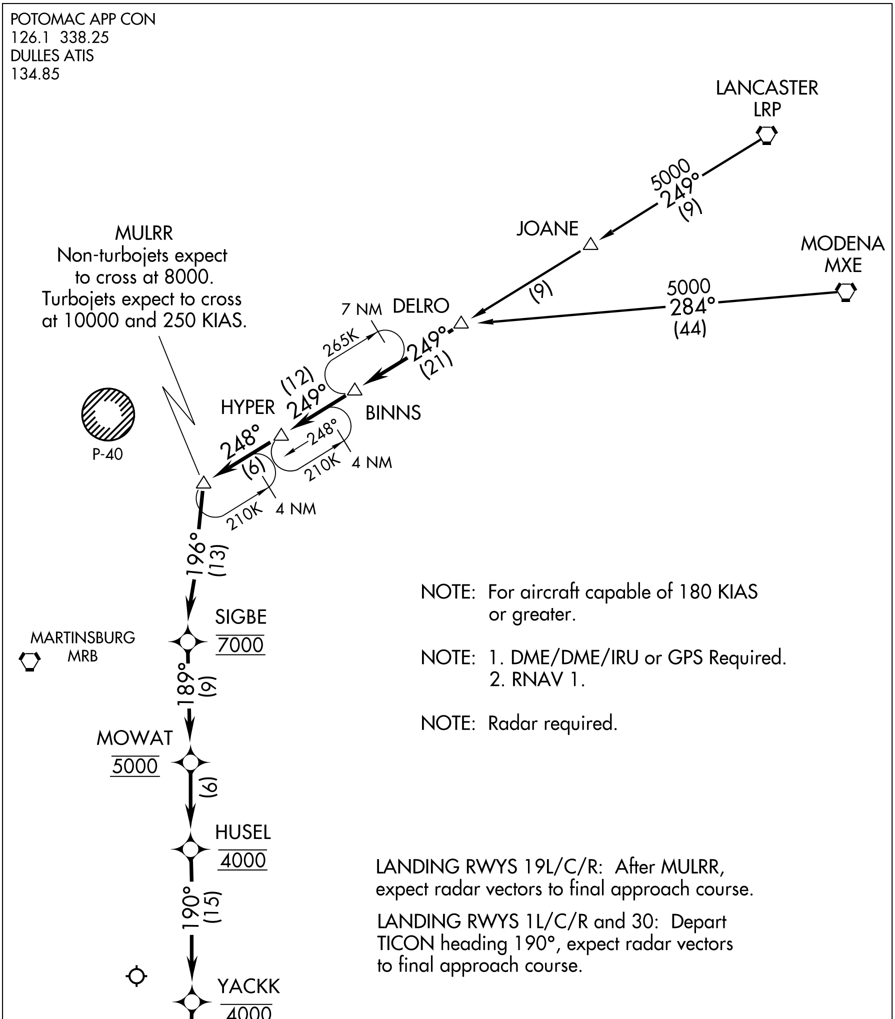
NOTE: BAYYS departures expect vectors to BDR VOR/DME or BDR R-054.
NOTE: BIGGY departures expect vectors to SBJ/SBJ R-237.
NOTE: COATE departures expect vectors to SAX VORTAC or SAX R-311.
NOTE: DIXIE departures expect vectors to COL/COL R-192.
NOTE: ELIOT departures expect vectors to SAX R-252.
NOTE: GAYEL departures expect vectors to DPK R-320.
NOTE: GREKI departures expect vectors to CMK R-057.
NOTE: HAAYS departures expect vectors to HUO R-145.
NOTE: LANNA departures expect vectors to PTW R-059.
NOTE: MERIT departures expect vectors to LGA R-055.
NOTE: NEION departures expect vectors to LGA R-322.
NOTE: PARKE departures expect vectors to BWZ/BWZ R-250.
NOTE: SHIPP departures expect vectors to JFK/JFK R-139.
NOTE: WAVEY departures expect vectors to JFK/JFK R-156.
NOTE: WHITE departures expect vectors to COL VOR/DME or COL R-204.

TAKEOFF OBSTACLES:
Rwy 11: Trees beginning 170′ from DER, left and right of centerline, up to 96′ AGL/526′ MSL. Terrain 140′ from DER, 248′ left of centerline, 0 AGL/392′ MSL′.
Rwy 16: Windsock and trees beginning 309′ from DER, 187′ left of centerline, up to 101′ AGL/510′ MSL. Trees beginning 1005′ from DER, 90′ right of centerline, up to 127′ AGL/436′ MSL. Poles 3433′ from DER, 604′ left of centerline, up to 105′ AGL/510′ MSL. Terrain 273′ from DER, 515′ left of centerline, 0′ AGL/387′ MSL.
Rwy 34: Windsock 167′ from DER, 282′ right of centerline, 26′ AGL/456′ MSL. Trees 612′ from DER, 560′ left of centerline, up to 81′ AGL/491′ MSL. Trees beginning 2011′ from DER, 751′ right of centerline, up to 104′ AGL/504′ MSL. OL on DME 605′ from DER, 263′ right of centerline, 20′ AGL/454′ MSL.
Rwy 29: Trees beginning 6′ from DER, 14′ right of centerline, up to 103′ AGL/593′ MSL. Pole and trees beginning 425′ from DER, 228′ left of centerline, up to 108′ AGL/488′ MSL. Tank 1.19 NM DER, 751′ right of centerline, 86′ AGL/599′ MSL. Pole 212′ from DER, 485′ right of centerline, 23′ AGL/417′ MSL.

NE-2, 27 AUG 2009 to 24 SEP 2009

HYPER TWO ARRIVAL (RNAV)

NE-3, 27 AUG 2009 to 24 SEP 2009



NOTE: For aircraft capable of 180 KIAS or greater.

NOTE: 1. DME/DME/IRU or GPS Required.
2. RNAV 1.

NOTE: Radar required.

LANDING RWYS 19L/C/R: After MULRR, expect radar vectors to final approach course.

LANDING RWYS 1L/C/R and 30: Depart TICON heading 190°, expect radar vectors to final approach course.

ARRIVAL ROUTE DESCRIPTION

LANCASTER TRANSITION (LRP.HYPER2)
MODENA TRANSITION (MXE.HYPER2)

From over DELRO via 249° track to BINNS, thence as depicted to TICON.

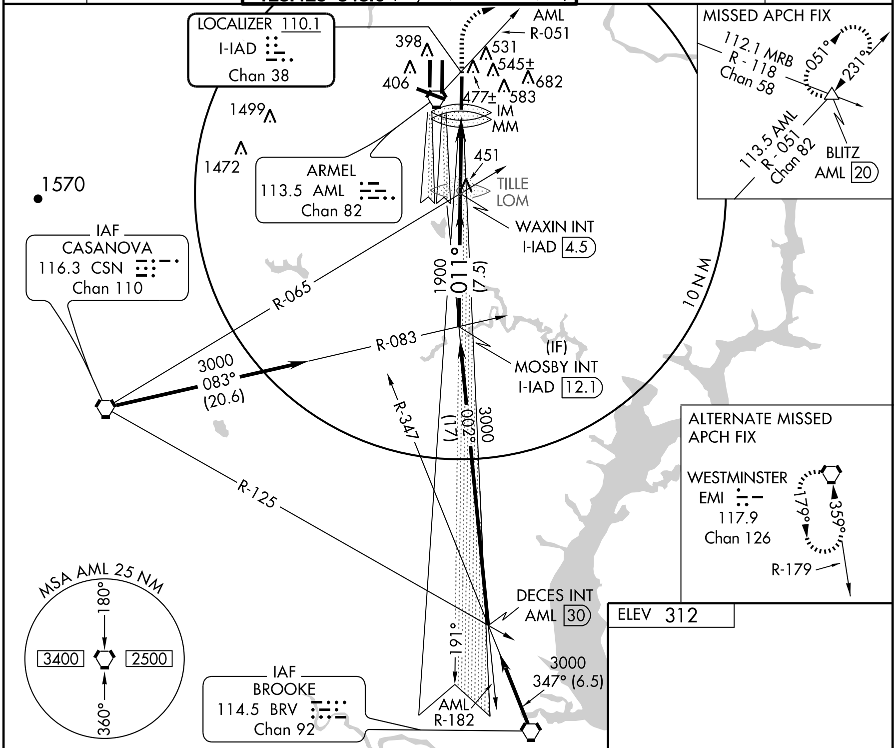
NE-3, 27 AUG 2009 to 24 SEP 2009

LOC/DME I-IAD **110.1** Chan 38	APP CRS 011°	Rwy ldg 11500 TDZE 312 Apt Elev 312

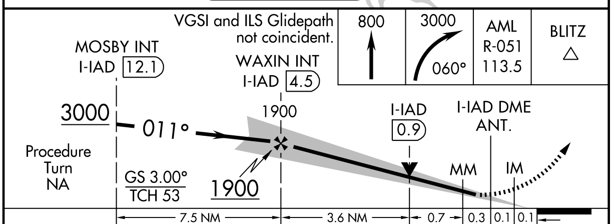
ILS or LOC RWY 1R
WASHINGTON DULLES INTL (IAD)

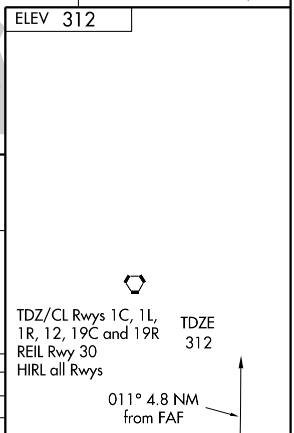
Simultaneous approach authorized with Rwy 1C or 1L. LOC procedure NA during simultaneous operations.	ALSF-2	MISSED APPROACH: Climb to 800 then climbing right turn to 3000 via heading 060° and AML VORTAC R-051 to BLITZ INT/AML 20 DME and hold.

ATIS	POTOMAC APP CON	DULLES TOWER	GND CON	CLNC DEL
134.85	120.45 306.925	120.1 317.8 (Rwy 1R/19L) 120.25 348.6 (Rwy 1C/19C) 128.425 348.6 (Rwys 1L/19R and 12/30)	121.9 317.8 (EAST) 132.45 348.6 (WEST)	135.7 317.8



NE-3, 27 AUG 2009 to 24 SEP 2009





CATEGORY	A	B	C	D
S-ILS 1R	512/18 200 (200-½)			
S-LOC 1R	760/24 448 (500-½)		760/40 448 (500-¾)	760/50 448 (500-1)
CIRCLING	940-1 628 (700-1)		940-1¾ 628 (700-1¾)	940-2 628 (700-2)

FAF to MAP 4.8 NM

Knots	60	90	120	150	180
Min:Sec	4:48	3:12	2:24	1:55	1:36