

# DC-6

## TUTORIAL 2



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## Introduction

Welcome to Tutorial #2 for the PMDG DC-6! In Tutorial #1 we provided you with a good understanding of how to operate the aircraft. By the end of this tutorial, you should be able to fly one of the most advanced versions of a commercial propliner currently available for MSFS while using routing more appropriate for the time in which the aircraft was being operated commercially.

We will expand upon the concepts of Tutorial #1 by including cold and dark procedures, and VOR to VOR navigation.

In order to concentrate on flying the aircraft and the techniques discussed in the tutorial, much like the first tutorial, this will be flown without weather.

## Overview

Our schedule today takes us from KSEA – Seattle-Tacoma International Airport in Seattle, Washington, to CYVR – Vancouver International Airport in Vancouver, British Columbia.

Vancouver is the most populous city in the province of British Columbia and is one of the most linguistically and ethnically diverse cities in Canada. Also of note is that it is consistently one of the top five cities in the world for livability and quality of life.

## The Flight Plan

The flight plan for today's flight is a little less-than-modern approximation of what a DC-6 crew might have flown at the time.

The flight time is approximately 60 minutes, plus the time spent on the ground. We will be cruising at 8000 feet, and the route is as follows:

KSEA/34R PAE V23 BEZOV V23 EGRET TATGO YVR CYVR/08R

***IMPORTANT:*** If the Introduction Manual has not been read, please review it prior to completing this tutorial.

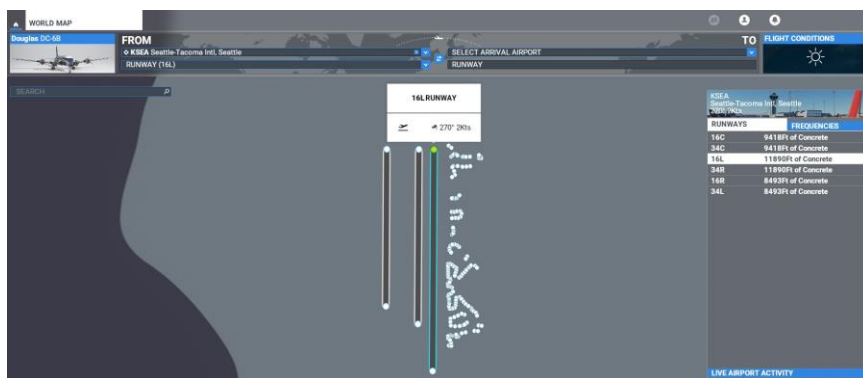
***Note:*** Since this tutorial is more involved, we strongly suggest that you read this document in its entirety before flying the tutorial itself.

## Setting Up the Flight

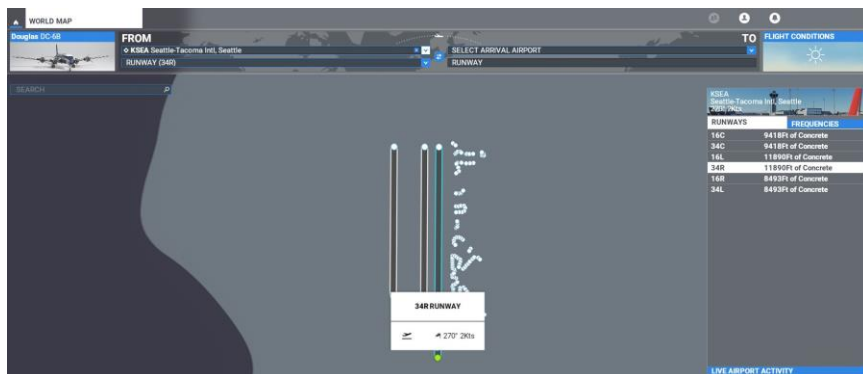
Start Microsoft Flight Simulator and go to the World Map.

If you have not already selected the PMDG DC-6 from the Aircraft Selection screen, go ahead and do so now.

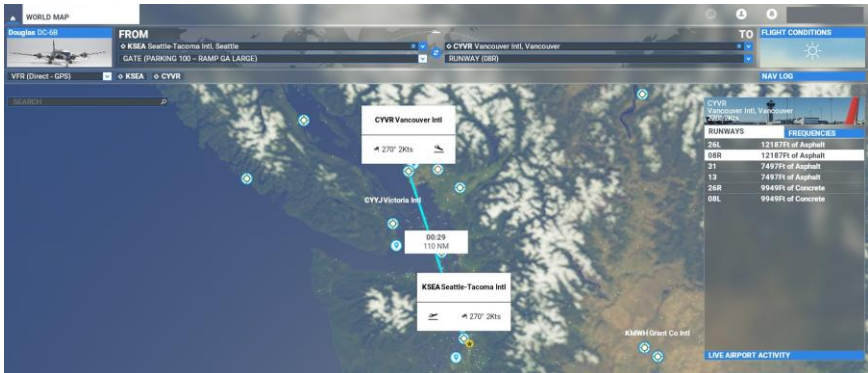
1) On the World Map screen, with the DC-6 selected, select KSEA in the ‘SELECT DEPARTURE AIRPORT’ dropdown:



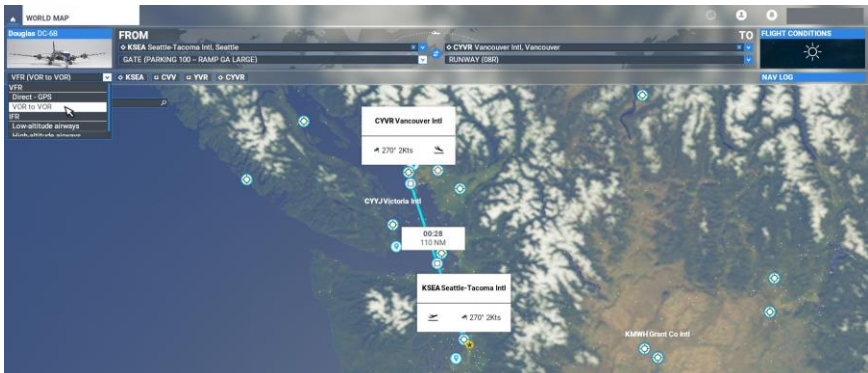
2) Select ‘GATE (PARKING 100 – GA LARGE)’ in the Runway/Parking selection dropdown:



3) In the 'SELECT ARRIVAL AIRPORT' dropdown, search for and select CYVR, and then select 'RUNWAY (08R)' in the Runway/Parking selection dropdown:



4) In the Navigation Type selection dropdown, select VOR to VOR:



Click on 'Flight Conditions' at the top right of the screen and select 'Clear Skies.'

Click the yellow 'FLY' button to start your flight. You will be positioned on Ramp 100 Parking with the airplane in a Cold and Dark state.



## Configuring the Radios

For today's VOR to VOR flight with an ILS approach into runway 08R at Vancouver International, we will be using the PMDG Bendix radios.

Please go to the Options page in the tablet. In the GPS/Radios Options, select 'PMDG Bendix Radios (No GPS)':



## Fueling and Loading the Airplane

Let us add some fuel. Go to the Fuel and Load Manager page in the tablet and press the *Set Fuel 50%* button. This will set the airplane up with 50% of fuel properly loaded and distributed:



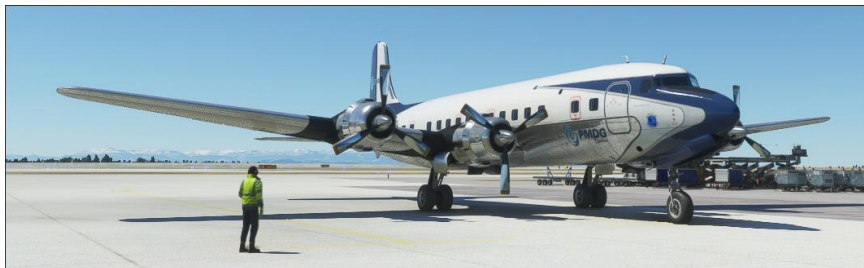
We have some cargo and passengers going to Vancouver, so let us load the airplane:

Hold your mouse cursor over the top half of the cargo text field and scroll forward. This will increase the cargo load by 25% with each scroll. Three forward scrolls will give you 6983 lbs. (75%) of cargo.

Hold your mouse cursor over the top half of the passenger text field and scroll forward. This will increase the passenger load by 25% with each scroll. Three forward scrolls will give you 51 pax (75%).

**Note:** For detailed instructions on how to use the Fuel and Load Manager, click the Help button to the lower right of the page.

## Getting Started



You will find the airplane in a cold and dark state, but with the help of the AFE, things will move relatively quickly.

To get us going, pull up the tablet and call for the GPU (Ground Power Unit) from the Ramp Manager page:



To check whether the GPU is hooked up and supplying power, press the annunciator right above the Plane Battery/Ground Power switch:



The annunciator will illuminate if the GPU is connected and providing power to the airplane.

Switch the Plane Battery/Ground Power switch to the Ground Power position. The annunciator will now be illuminated, indicating that the GPU is connected and supplying power to the airplane.

Pull up the tablet, go to the AFE page, and run the Before Start checklist (click the slider so that it turns green).

The AFE will set everything up for you, right up to the point where you will start the engines:

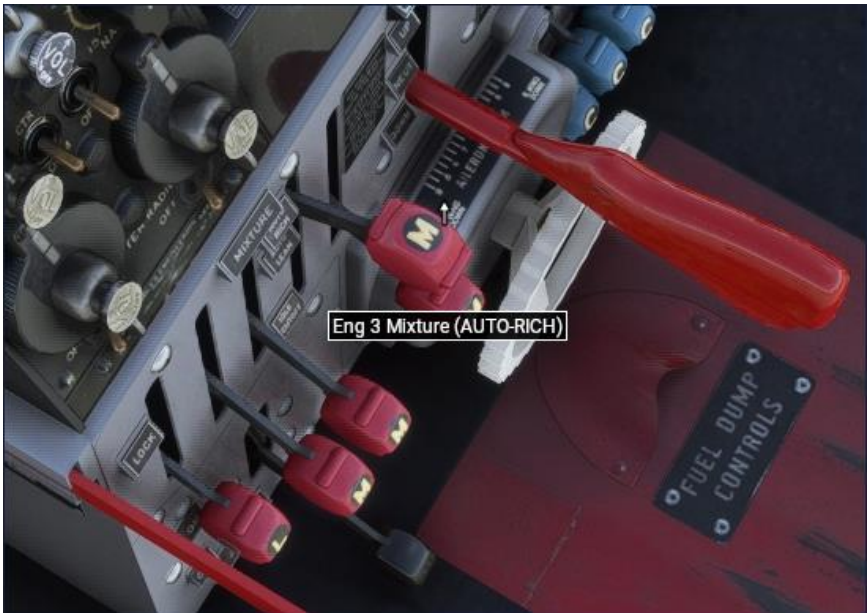


## Engine Start

After the AFE finishes the Before Start checks, you will be ready to start the engines. The start sequence on the DC-6 is 3-4-2-1.

### Engine #3 Start

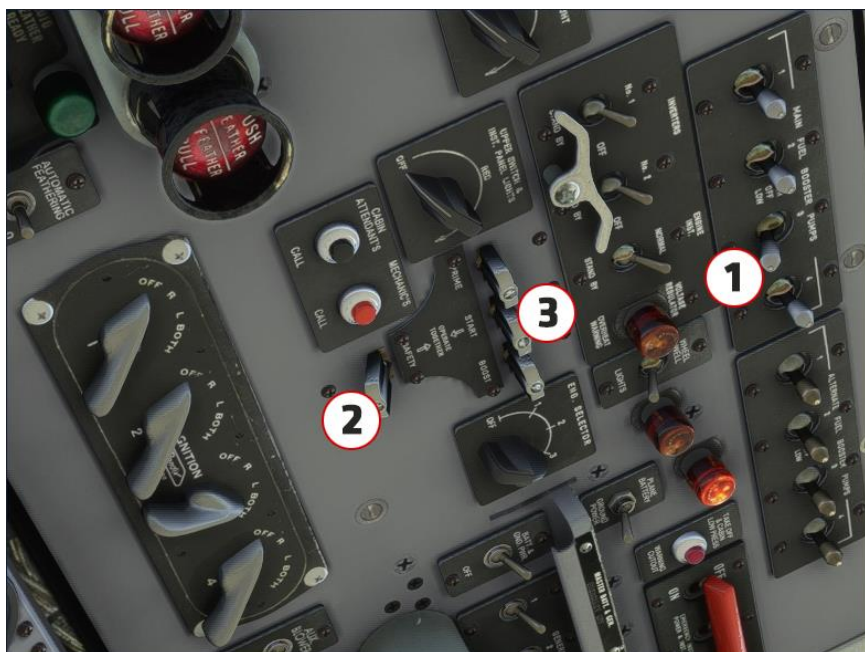
For the engine #3 start, the AFE has already set Engine 3 Mixture to Auto-Rich:



- 1) To start engine #3, set the Engine 3 MAIN FUEL BOOSTER PUMP to LOW. If you are using Realistic Start, you need to set the pump to LOW. If you are not using Realistic Start, the AFE will set this for you.
- 2) Press the START/SAFTEY switches (a single click on any one of these will trigger both switches simultaneously). The AFE will count to 12 (Three...six...nine...twelve).
- 3) When the AFE says “twelve,” press the BOOST switch, and then the PRIME switch.

The engine will fire up.

Once it is running stable, the PRIME/START/BOOST and SAFETY switches will release automatically.

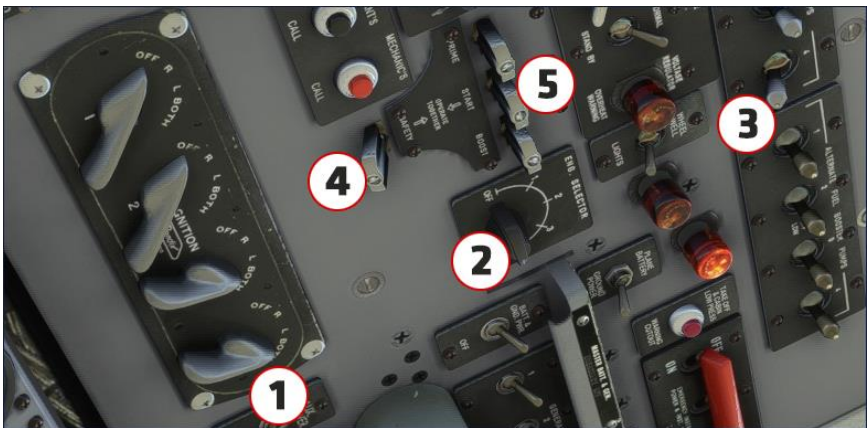


**Engine #4 Start**

Set the Engine 4 Mixture lever to the Auto-Rich position:



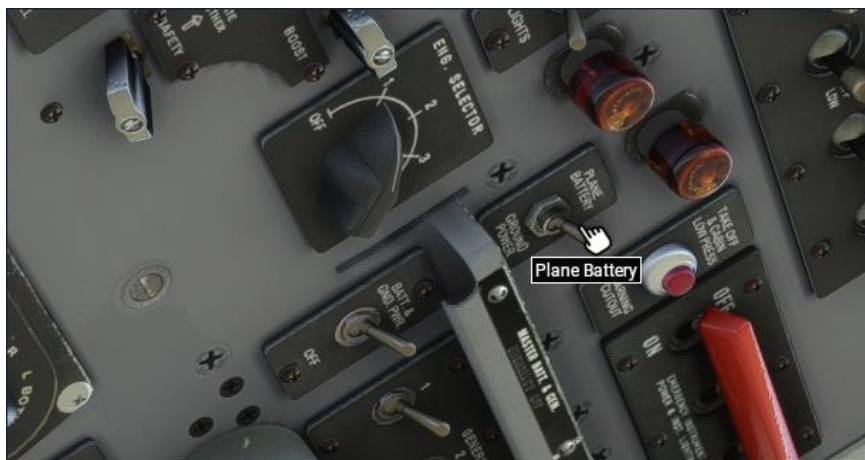
- 1) On the overhead, set the Engine 4 ignition switch to BOTH.
- 2) Set the Engine Selector to 4.
- 3) Set the Engine 4 MAIN FUEL BOOSTER PUMP to LOW.
- 4) Press the START/SAFTEY switches (a single click on any one of these will trigger both switches simultaneously). The AFE will count to 12 (Three...six...nine...twelve).
- 5) When the AFE says “twelve,” press the BOOST switch, and then the PRIME switch.





The engine will fire up. Once the engine is running stable, the PRIME/START/BOOST and SAFETY switches will release automatically.

After starting engines #3 and #4 and confirming that they are running stable, set the Plane Battery/Ground Power switch to Plane battery:



Now go ahead and remove the ground power unit (GPU) on the Ramp Manager page in the tablet:





Repeat the start procedures as explained above for Engine #2 and then #1.

After having started all 4 engines, pull up the tablet, go to the AFE page, and run the After Start checklist (click the slider so that it turns green):



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## Takeoff Briefing

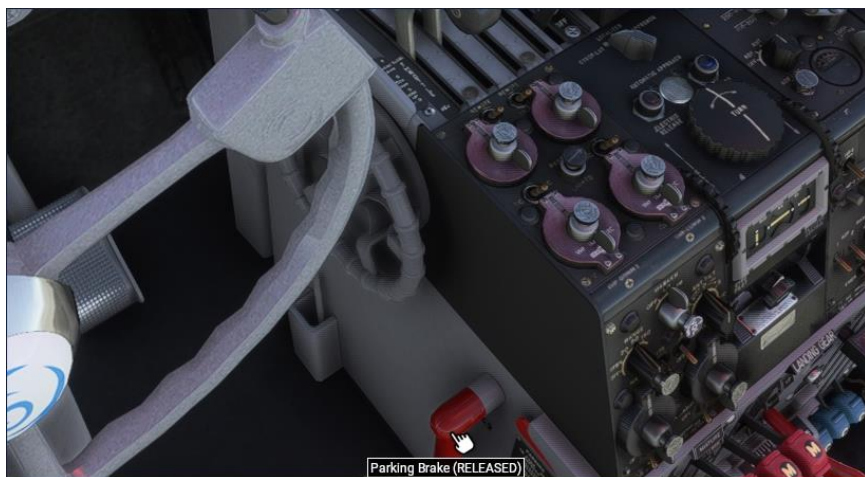
- 1) To prevent your hardware throttle interfering with the AFE, leave it at idle stop.
- 2) Hold the brakes to remain in position while the AFE sets the takeoff power.
- 3) We will be using Takeoff (Wet) for this takeoff, as we are over 87,000 lbs of gross weight.
- 4) Begin rolling only after you hear the AFE confirm that full power has been set.
- 5) Our  $V_R$  (rotation speed) will be 100 knots.
- 6) When we reach  $V_R$ , smoothly increase backpressure on the yoke to raise the nose.
- 7) Climb out at 130 knots and then pitch over slightly at about 500' above the ground (about 347' MSL here) to reach 140 knots.
- 8) The AFE will retract the flaps and then set Maximum Except Take Off (METO) power during this time. When the flaps are retracted, you will need to apply a little back pressure on the yoke and trim accordingly.
- 9) The AFE will then set CLIMB power and run the after-takeoff checks.
- 10) Continue the climb at 165 knots.

## Pushback and Taxi

When the AFE has completed the After Start checks, it is time to push back and taxi to the holding point of runway 34R. You can push back using 2 methods:

- 1) Use the simulator's pushback. The default command for pushback is SHIFT+P.
- 2) Use the airplane's reverse pitch capability to reverse out of your parking bay prior to starting your taxi.

Whether you decide to use SHIFT+P or reverse pitch to push back, go ahead and RELEASE the Parking Brake:



- 1) To push back using the simulator's pushback mechanism:

Confirm that the Parking Brake is RELEASED, and press SHIFT+P on your keyboard. To stop the pushback, press SHIFT+P again.

- 2) To push back using reverse pitch, pull the Reverse Pitch Selector back to the REVERSE position:



After confirming that the Parking Brake is RELEASED and the Reverse Pitch Selector is in the REVERSE position, pull the throttles all the way back into reverse (*push the throttle lever/s on your external hardware all the way forward*). The airplane will now start to move backward slowly.

You will need to judge your speed and position going backward, and anticipate when you want to come to a full stop on the taxiway.

When you are ready to come to a stop, push the throttles back out of reverse, over the gate, and into the idle stop position (*pull the throttle lever/s on your external hardware all the way back*).

**CAUTION:** Do not use the brakes to come to a stop when you are using reverse pitch to move the airplane backwards, as it could lead to the nosewheel lifting off the ground, and the airplane tipping over on its tail.

Set the Parking Brake and pull up the AFE page in the tablet. Start the Before Takeoff checks:



Release the Parking Brake and slowly advance the throttles. Turn to the right (south) and start taxiing to the holding point of Runway 34R via taxiway BRAVO:



**Tip:** Taxi in a southerly direction all the way to the holding point, passing taxiways LIMA, MIKE, NOVEMBER, PAPP, QUEBEC and SIERRA on your right-hand side, while keeping to the left of Runway 34R/16L.

During the taxi to the holding point at Runway 34R, go ahead and set up the radios and instruments.

Set the NAV1 frequency to 110.60 (PAE VOR-DME). Then set the NAV1 standby frequency to 115.90 (YVR VOR-DME).



Set the course on the Bendix VOR1 head to 344°, which is the radial of the PAE VOR.



## Takeoff

When you are ready for takeoff, taxi onto the runway centerline. When you have lined up on the centerline, set the Parking Brake.



To begin your takeoff roll, go to the AFE page in the tablet and click Takeoff (Wet).



Hold the brakes until you hear the AFE say “full power set.” Release the brakes and commence the takeoff.

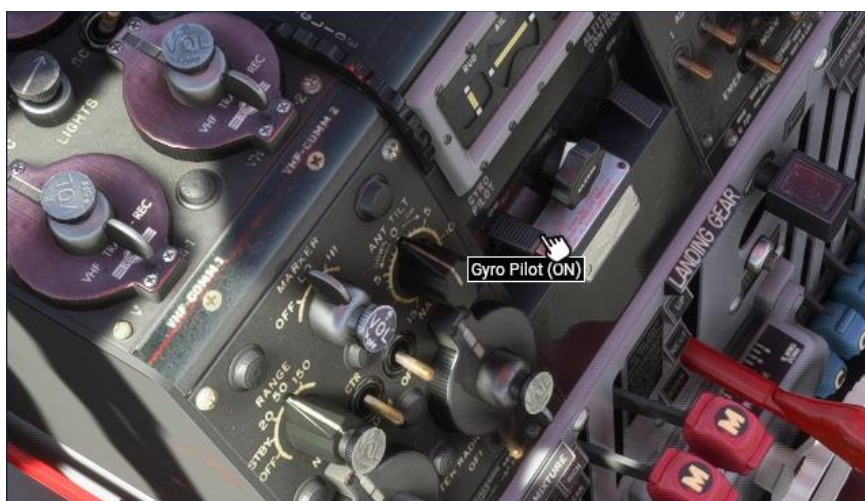


## Climb



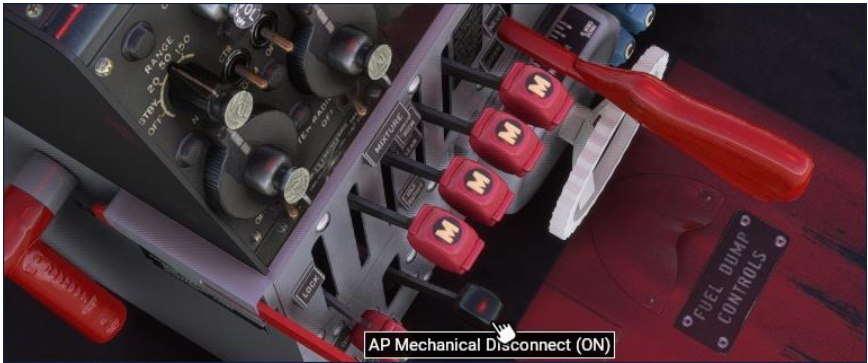
After the AFE sets climb power, pitch for 165 knots in the climb. Use trim as required. The AFE will continue to maintain climb power so that you do not need to increase throttle as you climb. When trim is set and the airplane is climbing at approximately 165 knots, let go of the yoke briefly, and continue reading below.

Look down at the back of the pedestal to find the Gyro Pilot switch on the autopilot. Turn it ON:





Look below the (red) mixture levers to find the AP Mechanical Disconnect. Turn it ON:



This will enable the autopilot and cause it to hold wings level and maintain the current pitch.

***Note:** The two steps above can be combined by using Z on your keyboard to engage the Gyropilot, and SHIFT+Z to disengage it.*

If the airspeed is too low/decreasing, roll the AP Climb Glide Wheel forward to pitch the nose down. If the airspeed is too high/increasing, roll the AP Climb Glide Wheel aft to pitch the nose up:



You now need to turn the aircraft to the right, to intercept the 344 radial TO the PAE VOR, using the AP Turn Knob:



Turn the knob to the right to increase the bank angle, or back to the left to decrease the bank angle. Stop the turn and level the wings at a heading of 344 degrees.

***Note:** To center the AP Turn Knob, press the silver button located above the AP Turn Knob and between the Electric Release (red) and Approach Ready (blue) annunciator lights.*

On the Gyropilot control panel, turn the Autopilot Mode knob to LOCALIZER.



The Gyropilot will now track the PAE VOR, and your LOC (Localizer) needle and VOR1 bearing pointer should look like this:



Continue climbing until you reach 8000 ft. You may want to use the AP Climb Glide Wheel to slowly decrease the climb rate before engaging Altitude Control:



## Cruise



After leveling off, allow the aircraft to accelerate to your cruise speed before running the cruise checklist and reducing power and RPM. This will allow the aircraft to settle onto the speed faster, improving efficiency, particularly on longer flights.

While the speed is increasing, and since you are nearing PAE, delay running the cruise checklist to set up flying the outbound radial off the PAE VOR.

Set the Autopilot Mode switch to GYROPILOT, and then rotate the VOR1 OBS knob so that 329° is at the top of the VOR gauge and showing a TO indication.

As you approach the PAE VOR – you can determine this by watching the DME indication tick down on the far left of your panel (just above the transponder) – you can either finesse the aircraft onto the new radial with the AP Turn knob, or set the Autopilot Mode switch to LOCALIZER, and the aircraft will turn onto the radial itself with relative ease:



Pull up the tablet, go to the AFE page, and run the Cruise checklist (click the slider so that it turns green):



As your speed increases, you will need to readjust your rudder trim to keep the ball centered.

Plan to start the descent at EGRET. To make sure everything is set for the descent, run the descent flow at BEZOV. Read the following pages ahead of time, since a lot of what will be going on will happen very quickly.

When there is no specific changeover point on a chart, standard procedure is to change to the VOR ahead of you at the halfway point. For us, this would be the HUH VOR (113.0), but this would mean changing to several VORs in the span of a few minutes, which is both impractical and unnecessary. For this reason, we will skip switching to HUH, and skip directly to the YVR VOR (115.90).

BEZOV is 25 DME from HUH, which makes it 38nm DME from PAE (the chart notes the total leg distance between PAE and HUH as 63nm). As we get close to BEZOV, we will set the Autopilot Mode to LOCALIZER, and switch to YVR's frequency and monitor the intercept.

Set 115.90 (YVR) as the standby frequency in the NAV1 radio.



As you approach BEZOV, run the descent flow, turn the Autopilot Mode switch to GYROPILOT, and then swap the frequencies in the NAV1 radio so that you are tuned to 115.90 (YVR).

Next, set the VOR1 OBS to 295°. The localizer (vertical) needle of the VOR1 gauge should be full right since we are to the “left” of this radial, being south of it.

A common rule of thumb for leading turns is 0.5% of your groundspeed for a 90-degree turn. Since our turn is about 30 degrees, we will take half of that as a conservative simple figure. For us, this is about 50% of 1.1, so we should begin the turn to 295 when we are 49nm DME from PAE:



In order to make things slightly simpler, begin a 500 foot per minute descent prior to attempting to lead the turn so that you are only concentrating on a single task.

As the localizer needle on the VOR1 gauge centers, reselect the Autopilot Mode selector to LOCALIZER.

## Descent



We will be using the visual approach to Runway 08R. The approach calls for 3,000 ft at YVR, and we will want to have slowed down and configured at least Flaps 20 by that point, so we should be at 5,000 ft about 10nm prior.

We suggest that you run the descent checks as you pass BEZOV and start descending once you've passed EGRET. This will give you a bit of a buffer, as it will make it easier to slow down the airplane in time for flap extension when leveling off at 3,000 ft over YVR.

As your speed increases, check your vertical speed indicator (VSI) and use the CLIMB/GLIDE wheel to adjust the vertical speed as necessary.

YVR will approach quickly. Approaching it, switch the Autopilot Mode switch to GYROPILOT and use the AP Turn knob to turn left to a heading of 260.

Reduce the vertical speed when approaching 3,000 ft, and switch Altitude Control ON as you reach 3,000 ft. Leveling off will help decelerate below 175 knots in order to be able to set Flaps 20.

Run the In Range checks after leveling off.

While the AFE runs through the In Range flows, set the NAV1 frequency to 109.50 and set the VOR1 OBS to 083°. This will provide additional guidance for the visual approach to Runway 08R.

Add flaps incrementally up to Flap 20 as the speed decreases under 175 knots.

At the end of the descent, we will fly a visual approach, aided by the ILS to Runway 08R.



## Approach



The approach will be a visual approach to Runway 08R, assisted by the ILS, which will help stabilize the aircraft on the proper lateral (LOC or localizer) and vertical (GS or glide slope) path.

The speed should decrease to about 175 abeam IGVAN, which is defined by 9.7nm DME outbound from YVR. This also marks your point to turn inbound. If the deceleration is too slow, manually reduce the throttle, keeping in mind that there should be a positive BMEP indication.

After doing a speed check for 175 knots, set flaps to 20 incrementally.

Turn the Autopilot AP Turn knob to the right so that the turn indicator (the vertical needle) on the turn and slip indicator is between the middle marker and the right-side arrow (a half-standard rate turn). Level out on a heading of 337° and activate the AFE landing flow. Fly this heading for 60 seconds, and then turn to heading 060°.

If the localizer needle on the VOR1 gauge does not begin to center, level out on a heading of 060° and proceed until the VOR1 localizer needle centers.

You should now have the runway in sight off to your right. As per the visual approach plate for Runway 08R: Intercept runway centerline not less than 6 DME at or above 3000.

When you are ready to do so, turn the Gyro Pilot switch OFF, and then set the AP Mechanical Disconnect to OFF.

Set Flaps 30 when established on final and let the speed reduce to 120 knots.

When established on final, allow your speed to bleed off. When landing is confirmed, set Flaps 50 to maintain 110 knots.

Aim to be over the threshold at 105 knots, flare, and touch down.



Let the speed naturally reduce with the assistance of light braking. Provided you land near the touchdown zone, the runway is long enough that there is no need to jump on the brakes.

Exit to the right.

## Taxi



After exiting the runway, run the After Landing checklist by clicking on the slider on the AFE page in the tablet.

Taxi south on Taxiway BRAVO to the General Aviation ramp.

## Shut Down



The ramp is rather small for General Aviation aircraft, but maneuver as best as you can to fit the aircraft on the ramp, away from the taxiway.

After arriving at the parking spot, set the parking brake.

Run the shutdown checklist by clicking on the slider on the AFE page in the tablet.