

FLYING THE 757

Of the many features simulated, this tutorial will cover the use and programming of various aircraft systems including; FMC/CDU, Traffic and Collision Avoidance System (TCAS II), as well as a fully functioning autoland system.

This tutorial has been produced as a quick start guide detailing a fictitious flight from YBBN (Brisbane) to YSSY (Sydney). The quick start guide will enable you to get your aircraft airborne, and fly from point A to point B.

More information on these airports and procedures can be found at www.airservicesaustralia.com.au and www.vatpac.org

FS ATC and Com1, Com2 communications are not used during the tutorial.

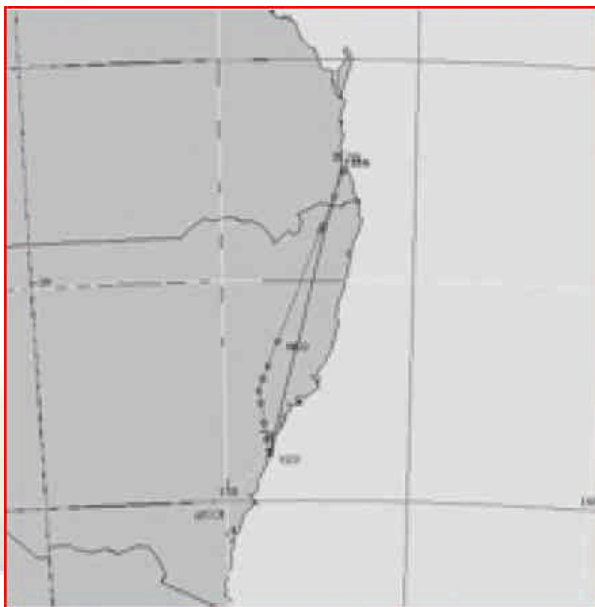
Please do not use any add-on weather programs with the tutorial.

ROUTE

YBBN DCT AF DCT LAV DCT APAGI DCT TESSI DCT MSO DCT MEHAN DCT
CORKY DCT BULGA DCT BOREE DCT YSSY

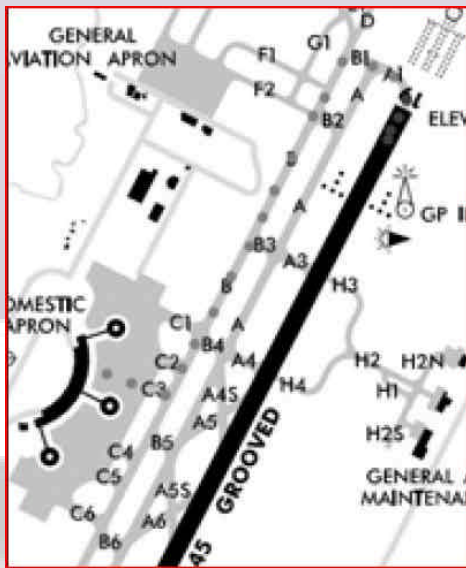
YBBN Archerfield Lav Apagi Tessi Mso Mehan Corky Bulga
Boree YSSY (416.0NM)

ID	FREQ	TRK	DIST	Coords	Name/Remarks
YBBN		0	0	S27°23'03.00" E153°07'03.00"	BRISBANE INTL
AF	419	197	11	S27°34'22.00" E153°00'96.00"	ARCHERFIELD
LAV	117.8	177	31	S28°05'23.00" E152°55'29.00"	LARAVALE
APAGI		190	49	S28°50'56.00" E152°35'07.00"	APAGI
TESSI		191	39	S29°27'04.00" E152°18'45.00"	TESSI
ADMAR		190	56	S30°19'22.00" E151°54'43.00"	ADMAR
MSO	326	191	69	S31°23'11.00" E151°24'45.00"	MOUNT SANDON
MEHAN		189	36	S31°56'30.00" E151°09'48.00"	MEHAN
CORKY		189	36	S32°29'55.00" E150°54'45.00"	CORKY
BULGA		160	18	S32°47'17.00" E150°57'50.00"	BULGA
BOREE		160	27	S33°14'14.00" E151°02'38.00"	BOREE
YSSY		159	43	S33°56'46.00" E151°10'38.00"	SYDNEY

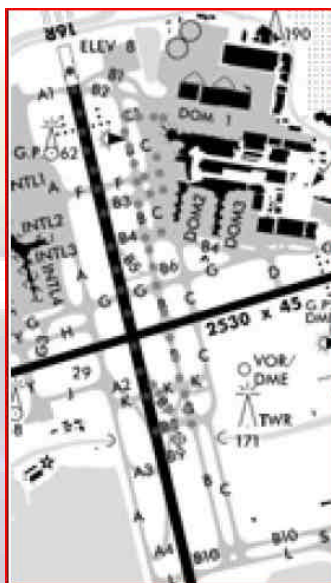


TAXI ROUTES

YBBN



YSSY



SET UP THE AIRCRAFT

NOTE – You need to have the original FS default flight; if you have set up a new flight as a default it will cause problems. Please reset it to Flights/other/ 'FLTSIM.FLT'

FSX users

1. Start FSX
2. Choose 'Free Flight'
3. Click on 'Load'
4. Choose '757 Captain tutorial flight' from the list and click 'FLY NOW!'

FS2004 users

1. Start FS2004
2. Choose 'Select a Flight'
3. Choose 'Other' from the drop-down box
4. Choose '757 Captain tutorial flight' from the 'Choose a Flight' box and click 'FLY NOW!'

The 757-200 in Just Flight's house livery will load at gate 24, Brisbane International Airport.

The aircraft is in a 'cold and dark' state. Here we are, sitting in the dark at Brisbane's International Airport, so WHAT DO WE DO NOW?

There are six easy steps to flying the B757.

- Gather your flight and aircraft operational information
- Initialise your aircraft
- Program the FMC via the CDU
- Configure the flight controls
- Set flight parameters in the MCP and EFIS
- FLY!

Gather your flight and aircraft operational information

This is the stage where we gather our flight plan, verify waypoints, set and check aircraft operational weights and balances.

Flight plan: As shown above our flight is YBBN to YSSY. The flight plan for today's flight is YBBN DCT AF DCT LAV DCT APAGI DCT TESSI DCT MSO DCT MEHAN DCT CORKY DCT BULGA DCT BOREE DCT YSSY or in waypoint format: YBBN Archerfield Lav Apagi Tessi Mso Mehan Corky Bulga Boree YSSY.

1. Next, using the default FS fuel/payload menu, you need to alter the fuel load to meet the requirements of this flight. Set all tanks (Left, Center, Right)

to 45.0%. This should give you a total load of 15,420 kgs / 33997 lbs worth of fuel.

2. Whilst you are in the Fuel and Payload menu, take note of the Gross weight as we will need this later.
3. Check airport weather report for wind direction and strength and airport atis for runway in use. For this flight winds are calm, and runway 19 is in use.

INITIALISE YOUR AIRCRAFT

1. Initialise aircraft systems

Click on the icons **E** and **BA** to activate the ground power unit and bleed air unit

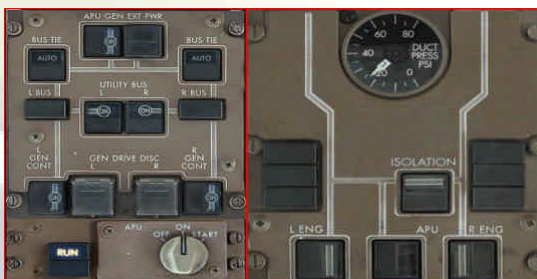


Open the overhead panel, and turn on the battery, and rotate the standby power switch to the AUTO position.



3. Connect ground power and external air

On the overhead electrical panel open the external power connection and confirm that the bleed air unit is activated. The 'DUCT PRESS PSI' gauge should be indicating roughly 30 PSI.



4. Start the APU

The next step is to start the APU, which can then take control of the power and air supplies. Starting the APU will automatically disengage the external power bus.

The APU is started by rotating the start selector to the start position; it will spring back to the run position once released.



Once the APU has started, you may disconnect the ground power and external air, making sure that you have enabled both the APU GEN and APU BLEED AIR.

PROGRAM THE FMC VIA THE CDU



Selecting CDU will open the FMC/CDU.

CDU layout and keys



1. Line Select Key
2. Function keys
3. Execute key
4. Alpha/numeric Keys
5. AIRAC cycle

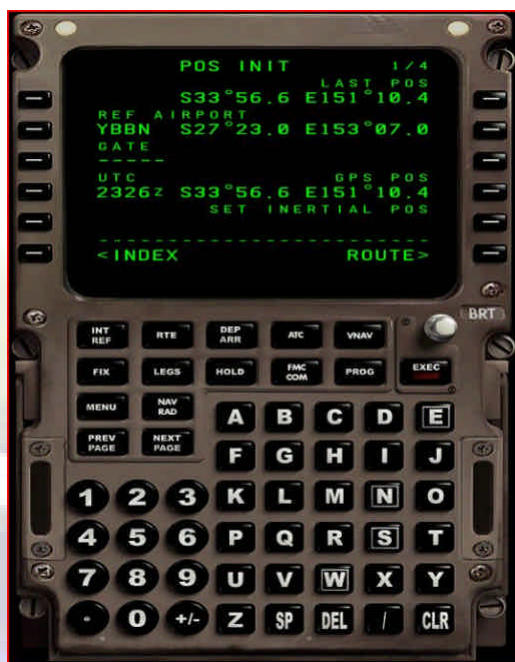
What do we program into the FMC? In the first step we gathered all the relevant information we will need to complete this task. This may look daunting and time consuming, but once you have mastered the technique you will be able to program your FMC in a matter of minutes.

The information we require at this time is:

1. Aircraft Position
2. Departure Airport
3. Destination Airport
4. SID (Standard Instrument Departure)
5. Flight Planned Route
6. STAR (Standard Traffic Arrival Route)
7. ZFW
8. Cost Index and Fuel Reserves
9. Flap Setting and V Speeds
10. CG %
11. Transition Altitude

1. POS INIT

The first page that appears is the IDENT page. Click on RLSK 6 to move on to the POS INIT page.



The very first item to be entered into the FMC is the aircraft's position.

Using the Alpha/Numeric keypad type in YBBN, then select LSK2 next to REF AIRPORT

Now re-open the overhead panel and carry out the following:

1. In the top left of the overhead panel is the IRS unit. Move the three knobs from their current position (OFF) to NAV



2. Turn on both yaw dampers



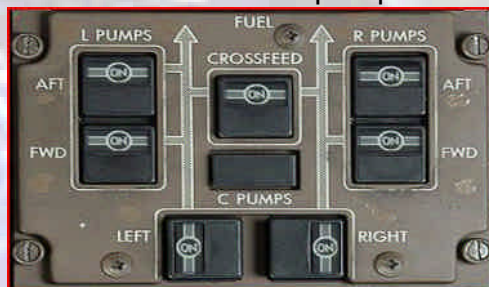
3. On the hydraulic pumps section, make sure all switches are set to ON



4. Turn on all four window heat switches



5. Turn on all of the fuel pumps



6. Make sure the NO SMOKING and SEATBELTS switches are set to AUTO or ON



7. Turn on TRIM AIR, set the air conditioning switches to AUTO and turn on the ISOLATION switch



Now go back to the CDU. Use the right LSK associated with the LAT/LON position of the airport and copy this data into the SET INERTIAL POS position

2. Departure Airport

After entering the information into the POS INIT page, select the RLSK associated with ROUTE, this will take you to the RTE page.



Enter the departure airport (YBBN) into the scratchpad, and then using LSKL1, enter the data into the ORIGIN.



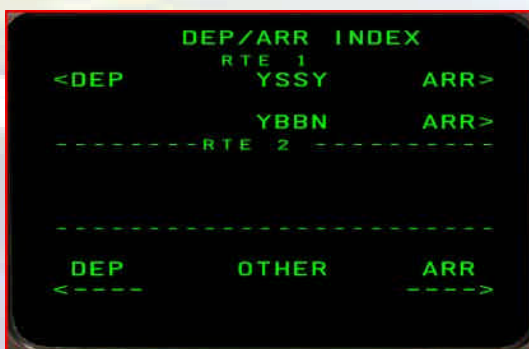
3. Destination Airport

Repeat for the above step, this time for the DEST space entering our destination airport YSSY

4. SID – Standard Instrument Departure

The next step is to set up our departure. Normally ATC will decide what SID, Standard Instrument Departure, you will be using. In this case we will be using the standard departure for south bound departures, the LARAVALE departure, (LAV).

Select the Departure/Arrival page by selecting the DEP/ARR button. This will open the departure and arrivals index.



Selecting DEP will display all the available departures for your selected airport.



We will be departing runway 19, therefore select 19. The screen will then display our selected runway.

5. Flight Planned Route

Step five is the insertion of the actual planned flight route. We have programmed in the runway we will be using for takeoff, therefore we need to enter the waypoints for the remainder of the flight. Select the RTE button and then NEXT PAGE to bring up the route page.



At RLSK 1, we want to enter our first waypoint, AF, so we type AF into the scratch pad and select RLSK 1.



The word DIRECT should appear in LSK1 and AF in RLSK 1

Once you have entered AF, you will need to repeat these steps on the next available line, and enter the remaining legs of the route LAV, APAGI, TESSI, MSO, MEHAN, CORKY, BULGA and BOREE.

When entering in several of these waypoints, a page will appear asking you to select the desired waypoint. This is because there is more than one waypoint with that name. The nearest waypoint to you will appear at the top of the list, so go ahead and choose that one. You can also verify that it is the correct waypoint by matching up the co-ordinates with those shown in our route plan.

When you have finished this step and you are happy with the route, press the ACTIVATE key, RLSK 6. (Right Line Select Key 6)

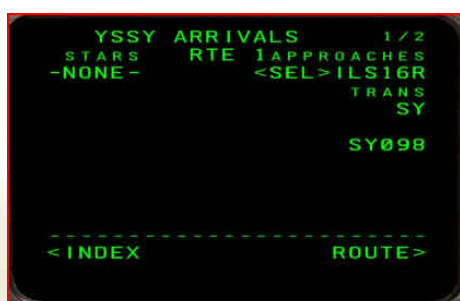
6. STAR – Standard Terminal Arrival Route

Normally on longer flights the arrival route or STAR is not programmed in to the CDU, until nearing Top Of Descent (TOD), or when advised of the STAR by ATC. On our flight we will program the STAR prior to departure as we are on a short flight, and we know what the winds will be on arrival into Sydney.

Programming the arrival involves the same processes as the programming of the departure.

For the arrival we will be using runway 16R, the closest to the domestic terminal, and it will afford a basic straight in approach.

Select the DEP/ARR button to open the DEP/ARR index, and then select our arrival airport YSSY.



From there you select runway 16R.

Note: Ensure that you select the EXEC key once you are happy the arrival route.

7. ZFW – Zero Fuel Weight

We have loaded the flight plan into the FMC, now we need to add the technical and/or performance data.

Once you have activated and EXECuted the route, return to the RTE page and select the LSK adjacent to PERF INIT, this will open the PERF INIT (Performance Initialisation) page.



Enter the gross weight you obtained from the Fuel /Payload menu (in lbs) by inputting it into the scratch pad and pressing the LSK adjacent to GR WT. Gross weight needs to be abbreviated before it can be entered into the GR WT line. If the gross weight of your aircraft is 178, 597 lbs then you would enter 178.6 into LSKL1. This will then calculate your ZFW.

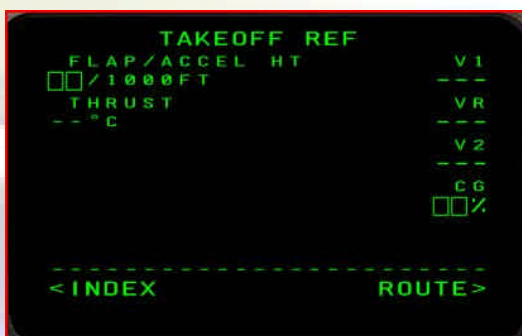
8. Cost Index and Fuel Reserves

Using the alphanumeric keys, enter your desired cruise altitude into the correct box, along with your Cost Index (we suggest you use 85 as a CI) and your reserve fuel.

The fuel load does not need to be entered into the CDU, as it is automatically calculated and entered in to the aircraft systems.

9. Flaps and V speeds

When you have completed the PERF INIT data input, select the RLSK6, next to TAKEOFF, this will open the TAKEOFF REF page. It is here that we will enter the flap settings, V speeds and the TAKE OFF CG% in order to calculate the required trim setting for take off.



On line 1, we can enter the FLAP setting; this can be 5, or 15. As this flight is short and we are not carrying a lot of fuel FLAP 5 will be sufficient. Once you have entered the FLAP setting the V Speeds are automatically calculated and appear down the centre of the display, as well as in the appropriate V speed line. If you are happy with calculated speeds all you need to do is line select each of the values to lock them in.

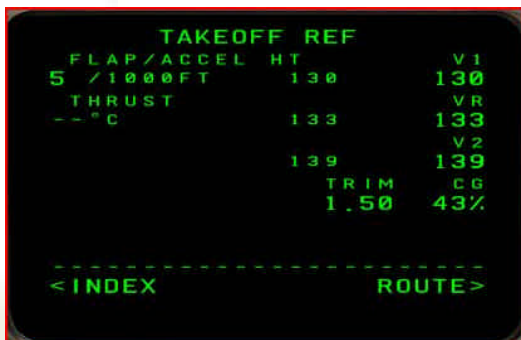


If you desire a derated Take Off thrust, you can enter an assumed temperature at LSK2.

CAUTION: Setting the thrust temp AFTER selecting your V speeds will DELETE these settings, and the V speed will need to be reselected.

10. CG %

The final data to be entered on this page is the CG%, which will then calculate the required trim settings for take off. A trim setting should now appear, set the stab trim to reflect this figure.



11. Transition Altitude

After we have completed the Take Off reference setting we will need to check and adjust as necessary the VNAV settings. To access these we need to select the VNAV button, to open the ACT ECON CLB page.

On opening you will see a revision of our cruise level, the aircrafts ECON cruise speed, and the Speed Transition level. There is also a line to add any required speed restrictions. The transition altitude is also recorded on this page.

In Australia the transition altitude (TRANS ALT) is 10000 ft, so we need to enter that into RLSK3, via the scratchpad.



We will also need to check the descent details; therefore you will need to select the next page button twice, to open the ECON DES page.



The transition level on this page is entered as a Flight Level, therefore you will need to enter the value "100" into the scratchpad and then select RLSK3.

Ok, only one more adjustment is needed before we have finished with the CDU.

Click on LEGS, this will bring up a page containing all of the legs/waypoints on the flightplan. Use the NEXT PAGE button to move to page 2. Enter 4000 into the scratchpad and press RLSK4. This will alter all of the altitudes for the various legs. Press EXEC to confirm the changes.

Congratulations! You have finished programming the CDU/FMC. The only other thing to do with the CDU now is to select the PROG button to open the Progress Page.

This will enable you to easily reference waypoint and position reporting data once underway.

Before we can depart there are still some other systems that need to be set up.

THE MCP – MODE CONTROL PANEL



The items that need to be set on the MCP include:

1. Initial altitude
2. Runway or assigned heading
3. V2 speed + 15

Before setting the MCP, we need to have our airways clearance from ATC, or as in our case when flying offline, we need to decide on the initial climb altitude. At Brisbane the common practice is aircraft are cleared to an initial altitude of 6000 ft, so we will also use this figure.

Select the altitude by moving your cursor over the right hand side of ALT selection knob (you should see a hand with a plus sign), and left click to increase the commanded altitude.

The runway heading for Brisbane runway 19 is 196 degrees, so in the same manner as entering the altitude we can enter the heading using the heading selector. Pressing the HOLD button under the heading selector, will hold the aircraft's current heading, and right clicking the SEL button in the middle of the Heading Selector will command the selected heading. Note: Both these actions will disengage the VNAV function, until such time as the pilot re-engages.



1. Speed selector
2. Heading Hold
3. Heading Select
4. Heading selector
5. ALT HOLD
6. Altitude selector

Selecting V2 + 15 in the IAS/MACH window will set our initial climb speed, for when we raise the gear and start to clean up the aircraft. The speed is selected in the same manner as the other two systems.

Time to fly!

1. Pushback and Engine start
2. Taxi
3. Take Off
4. Climb
5. Cruise
6. Descent
7. Approach
8. Landing
9. Shut down

We have now initialised the overhead panel and systems, programmed the FMC and set the MCP for our departure needs.

It is time to push back. Doors closed, passengers seated, No Smoking and Seat Belt signs on.

1. Push Back and Engine Start.

Complete the before pushback check

Push back is performed by the standard MSFS key command. SHIFT+P.

Turn on the beacon and position lights, if not already on.

Complete the 'before engine start' check list.

Open the overhead panel, and scan the systems. Once you have confirmed that all systems are operational, and required elements are operating you may start the engines. On the Pedestal Quadrant ensure that the fuel switches are in the "run" position, and the throttle levers are in the idle position.

Now you can either take a shortcut and carry out an automatic engine start by pressing Ctrl+E, or follow the instructions below:

Return to the overhead panel and select the right hand side engine starter to the ground position. It will spring back to the auto position once a successful engine start has been made.



Repeat this step for the left engine. You may disengage and shut down the APU at this stage. Remember to disengage the APU bleed and turn on the left and right engine bleed valves.

We are now pushed back from the gate both engines are operating with in the safety zones of all systems. Pressures are all correct and vibration is inside the allowed measures.

Switch on the nose/taxi light.



Complete the 'after start' checklist.

2. Taxi

We have been cleared to taxiing, so check for aircraft in the vicinity and taxi via the chart found at the front of this manual to the holding point at A1, runway 19. Do not enter the runway.

During the taxi complete the taxi check, including flight control systems. Set and check flaps are in the take off position. Open the EFIS and make your ND range 40 nm.

We are now at the holding point A1, runway 19. Complete the before take off checklist, turn the Wx radar on or off as required.

We have been cleared for immediate departure, turn on the landing lights, arm the auto throttle, activate the Flight Director, activate the TCAS and transponder and enter the runway.



1. Flight Director
2. EPR switch
3. Auto throttle
4. LNAV switch
5. VNAV switch
6. CMD Button

3. Take OFF

As you enter the runway scan your instruments and settings, once you are happy and have straightened the nose wheel and aligned on the runway heading advance the throttles. As the engines spool up, keep a very close eye on the gauges once the engines have passed 40% N1 and are spooling evenly engage the autothrottle by clicking on the EPR button. Maintain the runway centreline using the rudder and nose wheel steering, once over 80 knots nose wheel steering is inoperative.

Keep a close watch on your PFD, especially your speed tape. V1 is the go/no go speed once you exceed V1 you must take off. AT Vr apply gentle but firm back pressure to the yoke and rotate the aircraft to approximately 12 degrees. V2 is the minimum safe one engine climb speed

4. Climb



Once you have established a positive climb rate, which can be observed not only by physically being able to see the ground fall away from you, you can observe the altimeter and the VSI, or Vertical Speed Indicator, retract the landing gear, and start raising the flaps as required.

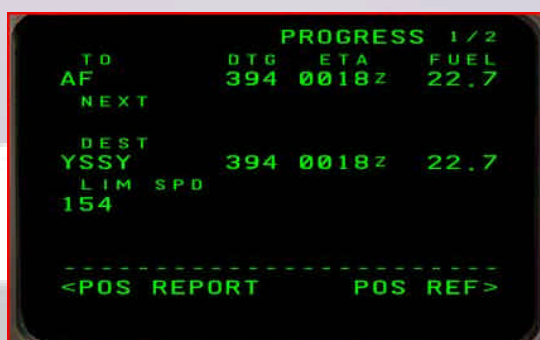
Keep flying the aircraft by hand, following the computed Flight Director inputs, until at least 1000 ft AGL. After passing 1000 ft AGL you may engage the autopilot, by selecting the CMD button. Also select LNAV and FLCH.

Passing 3000 ft, and the aircraft is behaving correctly, with all systems operational, change the MCP altitude to our cruise level of FL340, by selecting 34000 in the altitude window. Select VNAV in the MCP. Note: If any of the waypoint legs have an altitude restriction i.e. pass xxx at 6000 ft (which appears in the legs as xxx/6000) then the autopilot system will ensure that the aircraft does not exceed 6000 until passing the appropriate waypoint. Passing 10000 ft turn OFF the landing lights, set the altimeter to the standard pressure setting (2992/1013.2).

5. Cruise

The cruise phase of the flight is mainly one of systematic gauge monitoring, preparation for the arrival and when necessary providing position reports to ATC. Open the EFIS and extend the ND range to 160nm

If position reports are required for ATC needs, when flying in remote areas you can access this information from the PROG page.



Progress page

If you select POS REPORT (LSK6) you will find a complete report set out for you. It details the last waypoint with time passed (GMT/ZULU), altitude crossed, then ETA of the current waypoint (GMT/ZULU), and the name of the next waypoint.



Position report page

6. Descent

The descent and approach phases of the flight are very labour intensive, and things will get busy in the office.

At approximately 30 nm from the Top of Descent (TOD) which is indicated on the ND flight plan as a green T/D symbol, change the MCP altitude to FL210 by placing 21000 in the ALT window. This will allow the aircraft to commence descent automatically on reaching TOD. As you approach the top of descent, monitor your airspeed carefully, and watch for FMC messages to increase drag, if instructed to increase drag, open the spoilers by pressing the “/” key. Complete the descent checklist. Open the EFIS and reduce the ND display range to 40 nm.

Descent will commence automatically, and the descent deviation scale will appear on the right side of the ND. Once you have settled into the descent and the aircraft is behaving correctly, reset the MCP altitude to 6000 ft.

7. Approach

Passing 10000 feet the aircraft set the QNH to the local pressure, in our case 1013. Open the overhead panel and activate the landing lights, and start the APU. The aircraft should level out at 10000ft and reduce in speed to 250 knots before recommencing descent.

Open the NAV RAD page of the CDU. We need to enter the ILS frequency and course, so input 109.50/155 into the scratchpad and press LSKL4. The frequency and course will now appear below the heading of ILS-MLS.

As you approach waypoint BOREE set the heading to 162 degrees, and set the MCP altitude to 3000 feet. Switch from VNAV to V/S and set a vertical speed of -1200. Open the CDU to the approach page (INIT REF page) and set your landing speed and flap settings. Complete the approach checklist.

Depress the speed selector, the current speed will then display in the speed window; reduce speed to 210 knots IAS. As you pass overhead BOREE press SEL on the Heading Selector knob (right click on the knob), to activate the command heading, slow the aircraft to 190 kts IAS, lowering flaps as indicated on the flap/speed indicator. Press the LOC button to arm the localiser capture.



Flap speed indicator

8. Landing

Once LOC capture has commenced (the ILS should be picked up at about 25 miles from YSSY and the LOC capture should occur at around 15 miles) and with the glide slope flag two dots high arm the glide slope by selecting the APP button. When the glide slope flag is one dot high lower the landing gear, select flaps 20, and slow to $V_{ref} + 15$. When the glide slope has been captured reduce speed to $V_{ref} + 5$, lower flaps 30.



1. Localiser flag
2. Glide slope flag

At 1500 AGL the aircraft will close loop test the systems if all is ok LAND 3 will annunciate, at 60'-40' AGL it will FLARE, and at 25' AGL the engines will go into idle and the aircraft will ROLLOUT automatically.



On touchdown apply reverse thrust (visually check that the auto throttle has disengaged). At 60 knots reverse thrust off, manual braking to ground manoeuvring speed. Autopilot disengaged, press the master warning button to cancel the alarm, if necessary.

Take the first available exit to the left, and once clear of the runway hold your position.

Flaps retracted, spoilers down, landing lights off, transponder off, complete the after landing checklist and taxi to your stand, using the map at the front of the manual.

Set the parking brake once at the gate.

9. Shutdown

Confirm via the overhead panel, and lower EICAS that the APU is running, open the APU air bleed valves, open the throttle panel and select the fuel cut off switches to the cut off position.

Complete the shutdown checklist.

Secure the aircraft and complete the secure checklist.

Well done, you have completed your first flight in the B757.

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