

CoolSky Super 80 Professional FMC Flight

Introduction

The object of this little tutorial is not to teach you how to fly the Super 80 Pro completely but to show you how to program the FMC for a flight between KBWI RWY 15R and KBOS RWY 27.

The route will include the DEPARTURE from KBWI, ROUTE, and ARRIVAL into KBOS, and I will provide you with suggested FUEL and PAYLOAD figures for the flight.

Please note that in the USA it is normal for ARRIVING AIRCRAFT to be vectored from the LAST FIX on the STAR to the ILS by ATC so that will be ALL I will include in this tutorial.

I will discuss the use of AUTOPILOT and FMC during flight but I will not be going thru the set-up of the aircraft for a flight, I think this is covered fully by the ICTS system within the Super 80 Pro already.

The Route

The route will be as follows:-

KBWI SWANN3.SWANN V268 BROSS J42 RBV J222 JFK.SCUPP3 KBOS

First a quick explanation of what the above means, for those of you unfamiliar with flight plans in this format.

KBWI – Our departure aircraft

SWANN3.SWANN – This shows we are doing a SWANN3 Departure with a SWANN transition.

V268 - This is the VICTOR airway that crosses over SWANN that we want to fly.

BROSS – This is the intersection that we wish to leave the V268 airway and join the J42 airway.

J42 – The JET 42 airway.

RBV –Robbinsville VOR at this point we leave the J42 airway and join the J222 airway

JFK.SCUPP- The Kennedy VOR, at this point we leave the J222 and join the SCUPP3 arrival into KBOS

The actual route is as follows:-

KBWI-SWANN-GOLDA-BROSS-ODD-DAVYS-BRAND-RBV-LAURN-JFK-CUTOX-CUIKE-LFV-ARUM-CATUS-SCUPP-KBOS.

Note: - this is the route we will fly, BUT, thankfully we do not have to enter ALL of that into the FMC. More of that latter.

Tips and Points about the Flight.

1. Remember RUBISH IN MEANS RUBBISH OUT, you must be accurate when entering the DATA into the FMC, if you put wrong data in then your flight will not work!
2. Please use the FUEL LOAD and PAYLOAD I recommend for the flight or you will see different things than I do and it will make it harder for you to complete the flight.
3. As most airlines now use KGS for weights and balance I suggest you set up FSX to indicate KGS for weights, you set this up in the OPTIONS-SETTINGS-GENERAL then in the International box select UNIT of MEASURE to HYBRID

Starting the Flight

I suggest that you start your flight on runway15R, and just for this flight have no weather active, so make it a nice sunny day!

Setting up the aircraft

FUEL- 7.5 Tonnes (7500 KGs)

ZFW- 47.5 Tonnes (47500 KGs)

Set the aircraft up by using the DISPATCH FUNCTION.

Select the aircraft to READY for TAKE OFF from the TRAINING FUNCTION.

If you wish you may give yourself a little more fuel 300 or 400 Kgs so that you can follow the tutorial for the first time.

Just a little tip here, if you use the READY FOR TAKE OFF function go to the overhead panel and set the IRS MODE CONTROL KNOBS to OFF, wait a second, then back to ALIGN, when the in INDICATOR LIGHTS are flashing ALIGN turn the KNOBS back to NAV. This will ensure that your IRS system is correctly aligned for your flight.

SETTING UP the FMC

NOTE: - If you wish to pause FSX between each step as we go along that is fine, but do un-pause before you start entering data again.

I will be referring the buttons on the FMC as LSK*L (Left Soft Key) or LSK *R (Right Soft Key). They are numbered as shown below.



Open up your FMC press LSK6R which will select the POS INIT and follow the steps below.

1. POS INIT

- a. On this screen we enter the ACTUAL position of the aircraft by entering data in the LSK4R "SET IRS POSITION". You must not be moving when you enter this data as then your initial start point will be corrupted. You can enter this data when at any position on your departure airport. So how do we find out our position, in the real world this would be obtained from a parking chart showing the positions of the gates as LAT and LONG but in flight simulator we use SHIFT Z. This will open up your present position in the top left corner of your screen.
- b. You can either manually enter the data in the following format into the scratch pad by using the FMC keys.
 - N3911.1W07640.9
 - S2715.9E10116.8
- c. Note that the E/W entry is a THREE DIGIT entry for the DEGREES between 0 and 179, but the N/S entry is only TWO DIGITS between 0 and 89 DEGREES
- d. You can also quickly enter the LSK4R "SET IRS POSITION" by checking if the LAST POS data is the same as your present

position, if it is then press LSK1R to copy the data to the scratch pad, and then LSK4R to enter it into the FMC.

- e. Next we enter our DEPARTURE airport code into the scratch pad “KBWI” and press LSK1L “REF AIRPORT” this will give a position reference on the screen, but is only a reference to your departure airports location NOT the aircraft location. Your FMC screen should now look something like this.



- f.
g. Next press LSK6R “ROUTE” to move onto the next page.

2. ROUTE

- a. From now on we will be entering DATA into the FMC so I will use “S/P” as an abbreviation for SCRATCH PAD.
- b. In the S/P enter KBWI and press LSK1R to enter it as the DEST
- c. We are now going to enter the ROUTE, there are two way to do this, entering the route as individual W/PNTS or by making use of the VIA function which will let us enter the FIRST WPNT that is on the airway we wish to use and then the W/PNT that we are going to leave at. So as we wish to join V268 at SWANN do the following:-
- Enter SWANN in the S/P and press LSK4R this will enter it as our first ROUTE W/PNT.

- Enter V268 into the S/P and press LSK5L this will enter the AIRWAY we wish to fly
 - Enter BROSS into the S/P and press LSK5R this will then enter BROSS as the W/PNT that we wish to leave V268
- d. Your FMC should now look like this



- e.
- f. We have now filled up page 1 of the route so press NEXT PAGE and your FMC should look like this:-



- g.
- h. Enter the rest of the route as follows:-
- i. J42 into LSK1L
- j. RBV into LSK1R
- k. J222 into LSK2L
- l. JFK into LSK2R
- m. We do not enter the SCUPP3 arrival at this time as the actual arrival is not usually known until ATC inform the crew of what it is.
- n. KBOS into LSK3R

- o. Your screen should now look like this:-



- p. Notice that KBOS is not displayed, this is correct, the FMC knows this is our ARR airport as we entered that earlier.
- q. Press LSK6R to ACTIVATE the Flight Plan, the EXEC should light up indicating that the flight plan is safe to EXECUTE, press EXEC.
- r. Press LSK6R to move onto PERF INIT.
3. **PERF INIT**
- a. **IT IS MOST IMPORTANT THAT YOU ENTER THE DATA IN PERF INIT FOR THE LOADING THAT THE AIRCRAFT IS ACTUALLY IN. IF YOU DO NOT THE PERFORMANCE OF THE AIRCRAFT MAY NOT BE AS EXPECTED.**



- b.
- c. The PERF INIT should look something like above, the information we HAVE to enter is:-
 - CRZ ALT LSK1R 27000
 - FUEL/SCHED LSK2L 7.6 tonnes
 - ZFW LSK3L 47.5 tonnes
 - RESERVES LSK4L 1.8 tonnes
 - COST INDEX LSK5L 600
- d. The other data is optional, if you where flying in EUROPE it may be that the TRANS ALT may be different from the 18000 default which is the USA TRANS ALT.
- e. So if you loaded the aircraft as I suggested you should have something like below.



- f.
- g. Now it is time to check that we have actually entered the data correctly
- h. PRESS LEGS and you should see something like below



- i.
- j. **IF YOU DO NOT SEE ANY SPEED OR HEIGHT INFORMATION ON THE RIGHT OF THE SCREEN YOU WILL HAVE TO RENTER YOUR "SET IRS POSITION". DO THE FOLLOWING TO RESET IT.**
 - k. PRESS INIT REF on the FMC KEYPAD
 - l. Press LSK6L "INDEX"
 - m. Press LSK2L "POS"
 - n. RESET the SET IRS POSITION as described above.
 - o. Press LEGS to check if height data is displayed.
 - p. If you do have height data then the next step is to enter the departure, PRESS DEP/ARR on the FMC
 - q. The display should be as below



- r.
- s. We are departing runway 15R using the SWANN3 departure, so select :-
 - LSK4R RW15R
 - LSK2L SWANN3
 - You will then be asked for a TRANSITION from the SWANN3 so select LSK3L OOD.
- t. The EXEC button should now illuminate and you should have something like this below.



- u.
- v. Press EXEC, then LEGS.
- w. If you look at the legs displayed you will notice that you have a ROUTE DISCONTINUITY display, and also a couple of duplicated way points.



- x.
- y. If you page thru your LEGS by using NEXT PAGE and PREV PAGE you can review the whole route, on page 2/3 you will find BROSS and OOD already appear in our route so then can be safely removed and the DISCONTINUITY restored.
- z. Press LSK4L this will copy SWANN into the S/P, then press LSK1L this will then delete the other incorrect W/PNTS and PLACE SWANN as your first intersection, Then Press EXEC.
- aa. We can also get a visual representation of the flight plan by using the ND and selecting PLAN from the ND mode selector.
- bb. If you do this you can display the whole route by changing the range on the ND or you can cycle thru the W/PNTS by using STEP LSK6R on the FMC. This is always worthwhile doing before you depart.
- cc. You will notice if you STEP thru the flight plan that the route actually seems to stop at JFK, don't worry about this we have not yet entered our arrival into KBOS yet.
- dd. Remember to change your ND mode back to MAP.
- ee. The FMC and aircraft is ready for departure, so lets a level restriction up for one of the W/PNTS, if departing from KBWI it is not un-common to be cleared to cross SWANN at 8000 feet

because of departing traffic from KIAD passing above so we will set an altitude restriction of 8000 at SWANN in the following way.

- Select LEGS
 - In the S/P enter 8000 press LSK1R
 - Notice that the estimated speed and height for SWANN change from about 311/13111 to 250/8000 and the EXEC button illuminates. Notice too that all the following estimated speeds/heights are recalculated.
 - Press EXEC
- ff. Right we are nearly ready for take, on the FMGS panel set the following
- RUNWAY HEADING as HDG (156)
 - 8000 for ALT and arm the alt capture.
 - You do not need to set anything else.
- gg. Make sure that you have finished all your checks for take-off and your bugs are set and we are ready to go.
- hh. My takeoff procedure is as follows.
- RESET FUEL USED
 - RELEASE BRAKES
 - ADVANCE THROTTLES TO MAX
 - AS EPR PASSES 1.60 SELECT AUTOTHROTTLE
 - CHECK THAT EPR T/O IS DISPLAYED
 - AT VR ROTATE AND FOLLOW PITCH BAR.
 - SELECT GEAR AND FLAPS UP AS REQUIRED
 - AT 500 FEET AGL SELECT AUTOPILOT ON AND SELECT VERT SPD (ABOUT 1600 TO 2200 FT/MIN DEPENDENT ON WEIGHT) AND NAV, SELECT CL EPR
 - MONITOR SPEED AND ADJUST VERT SPD IF AIRCRAFT IS NOT ACCELERATING
 - AT 220 KNOTS SELECT VNAV
- ii. For this flight only, as this is not normal practice, before you reach SWANN change your FMGS panel setting for ALT to 12000 feet and watch what happens. As we have entered a height restriction in the FMC the aircraft should level at 8000 and while you have VNAV engaged it will not let you climb again until you have crossed SWANN. If you are cleared to an ALTITUDE by ATC you would ALWAYS enter that ALT into the FMGS
- jj. As soon as you cross SWANN climb and maintain FL270 as programmed into the FMC. Notice that the FMC keeps your speed to 250 knots below 10000 feet then accelerates the aircraft up to around 310 knots for the rest of the climb (cruise/econ climb)
- kk. All the time the aircraft is being held on track by the FMC.
- ll. Right lets look at the PROG page and see what that tells us.



mm.

nn. The PROG pages give us the most detailed information about our flight, looking at the example above it shows that I crossed BROSS at 13200 feet, my time crossing and the fuel I should have had. It then shows my info for STIKY, my DTG (distance to go), the ETA and the calculated fuel I should have remaining.

oo. It also shows the same information for my next W/PNT OOD and for the DEST KBOS.

pp. If you change 2/2 by pressing NEXT PAGE



- qq.
- rr. This shows the wind and it's affect on the flight. The XTK error, how far left or right of track you are. Your TAS the SAT and also the fuel the FMC calculates that you have used (note this may sometimes be different from what you actually have burnt)
- ss. During the climb we can have a look at another use page of the FMC the NAV DATA page. This is useful if you are cleared to a VOR direct by ATC and do not know the freq, or you have a VOR on your route and do not know the FREQ. To get to the NAV DATA page press INIT REF, LSK6L (INDEX) then LSK1R (NAV DATA)
- tt. To find out about a VOR enter the CODE (use OOD for this time) into the S/P then press LSK1L.
- uu. Notice that a choice of NAV AIDS appear, the one we want must be 112.80 as the other is in the southern hemisphere. So select LSK2L
- vv. Now you should have all the data for that NAV AID
- ww. It also contains data for ADF and FIXES.
- xx. Back to the PROG PAGE
- yy. When the aircraft levels at FL270, I hope you remembered to ARM ALT. Notice that The FGCS changes speed and that EPR changes to CR and the FMA changes to FMS SPD.

- zz. After the aircraft has been in the cruise for a minute or two, select CRZ. On this page it will show the ACTUAL CRZ ALT and the OPT or optimal cruise altitude, for this flight it will show that our optimal altitude is around FL350, so to save fuel enter 350 into the S/P and then press LSK1L and EXEC. You will then get a message to reset FGMS ALT on the PFD. Then enter into the FMGS panel 37000 feet and press VNAV. The aircraft will now start to climb to it's new CRZ ALT.
- aaa. Before RBV we would get our ATC clearance to proceed to KBOS by a STAR and what runway to expect, in our case it is the SCUPP3 arrival with a JFK transition for runway 22L
- bbb. Press DEP ARR and using the NEXT PAGE key find and select runway 22L, then find and select the SCUPP3 STAR, and then the JFK TRANSition. When you have selected them all press EXEC.
- ccc. If you now go into LEGS make sure that there are no ROUTE DISCONTINUTIES and notice that now we have the rest of our route displaying to KBOS.
- ddd. As you would normally be vectored by ATV to the ILS your route would normally finish at SCUPP, but to make it easy to land go to the page that displays KBOS and enter in the S/P NOLEY
- eee. Then using the LSK*L button next to the entry for vectors enter NOLEY into you flight plan. You will then get a ROUTE DISCONTIN message, press DEL and again press the LSK*L next to the VECTORS entry. This will DELETE the VECTORS entry, then press the LSK*L next to KBOS, this will copy KBOS into the S/P then next to the ROUTE DISCON message press the LSK*L button. Press enter now your route is in to KBOS via NOLEY which is an INTERSECTION on the 22L ILS.
- fff. If you look in the legs you will notice that at SCUPP there is a speed restriction and a height restriction of 240/11000 already entered. This is the correct height and speed for crossing SCUPP, but we do need a height and speed for NOLEY so we will be about right for the ILS so enter 220/3500 into the S/P then press the LSK*R button next to NOLEY then EXEC.
- ggg. If you now go back to the PROG page you may notice that out DTG to KBOS has changed by quite a bit, our ETA has changed and the CALC FUEL has also changed. Also if you zoom out on the ND you will now see a TD (Top of Descent) point is on the track line.
- hhh. You will be cued by the FMC to re-set your FMGS ALT setting as you approach the TD point, so re-set your ALT to 11000 and ARM it in the FMA. DO NOT PRESS VNAV. At the TD point the aircraft will start the descent. **DO NOT EXPECT IT TO TRACK THE DESCENT PROFILE EXACTLY. THIS IS A REPRESENTATION OF A FIRST GENERATION FMC THAT WAS FITTED TO THE MD80.**
- iii. To clear FMC messages just press CLR
- jjj. On the way down we can find out some useful information press INIT REF. You will now see your APPROACH REF this gives

you your VREF for 28 and 40 flap at your current AUW; also it gives the runway information for KBOS22L with length ILS FREQ and CRS.

kkk. After crossing SCUPP reset the FGMS ALT to 3500, tune in NAV 1 to 110.3 and set the CRS to 216 and you are ready for your approach into KBOS.

I hope this little tutorial has been some help to you. But remember this is not how it is really done in the real world, because we, in general, do not have ATC then some things are done just for the FSX world only.

If you do fancy flying with ATC then I recommend www.FS-MP.COM as a great site to do it...

