

# WestWind Advanced Pilot Training Program

## International Procedures Part II

I was fortunate enough to have the opportunity to attend a formal course of instruction on International Procedures. This level of training is required by the FAA and ICAO prior to performing duties as a pilot in an aircraft operating in special use airspace. Specifically the FAA states that in accordance with Chapter 222 of the inspector's handbook 8700.1 crew members must know:

- ICAO operational rules and regulations
- ICAO measurement standards
- Use of oceanic flight planning charts
- Sources and context of international flight publications
- Itinerary planning
- FAA international flight plan, ICAO flight plan and flight log preparations
- Route planning within the special use airspace where flights are to be conducted
- En route and terminal procedures (different from U.S. procedures)
- Long range, air to ground communications procedures
- Structure of the special use airspace where flights are to be conducted
- Air traffic clearances
- International meteorology including significant weather charts, prognostic weather charts, tropopause prognostic charts and TAFs
- Specific en route navigation procedures for each type of navigation equipment required for use in the special use airspace
- Emergency procedures including emergency equipment, search and rescue techniques, navigation equipment failure techniques, and communication equipment failure techniques
- Navigational facilities and procedures including any long range navigation procedures associated with the planned route

In addition as air crews cross the Flight Information Region (FIR) boundary into another country you must also know and abide by its rules and regulations. Specifically CFR 91-703 requires U.S. operators to comply with the Federal Aviation Regulations or the country's rules and procedures where you are flying, whichever is more stringent takes precedent. (If under Part 91 you require at ETA  $\pm 1$  that weather be at least 3 miles visibility and 2,000' ceiling or you need an alternate where as the country you will be landing requires only 400' ceiling and one mile added to the approach to be flown for ETA  $\pm 1$  hour, the stricter FAA rules are the ones you must follow.

Finally ICAO stipulates in Annex 6 to the International Standards and Recommended Practices that an operator should not use a pilot-in-command of an aircraft on a route section for which that pilot is not currently qualified until that pilot has demonstrated the following knowledge requirements:

- Route to be flown and the airport to be used
- Terrain and minimum safe altitudes
- Seasonal meteorological conditions
- Meteorological, communications and air traffic facilities, services and procedures
- Search and Rescue procedures

Ok so that is a lot of information, what does it mean? Well if you fly only using MSFS built in ATC not much, as all of the airspace is built around simple Part 91 and AIM references. There is not international airspace and crossing FIRs and Oceanic Airspace is as simple as crossing ARTCCs in the US. There is not RVSM airspace and no MNPS airspace. If, however you fly online with VATSIM or IVAO then it is time to hit the books. These organizations tend to be very professional and model their airspace after their real world counterpart. Crossing from New York center to Gander Oceanic you better request your oceanic clearance and it must meet MNPS and RVSM compliances. You better have the correct NAT selected or are on a random route. You also better be sure to have selected proper reporting point along the track and make non-radar reports. (Unlike the real world both VATSIM and IVAO will have you on radar the entire time, although some controllers will “play” real world non-radar environment.)

For flight planning the charts available are:

- Flight Planning charts (These are usually the large wall charts seen in many FBOs)
- Orientation Charts (Jeppesen publishes two one for the Atlantic and one for the Pacific. These charts are very useful and contain airspace information as well as procedures. If you are serious about your oceanic flying a pair of these can be had relatively inexpensively as Jepp has opened a flight simulation store that sells old charts to simmers.)
- En Route charts (This is the authoritative route charts that provides the MSAs, restrictions along published routes and FIR crossing points. It is also very expensive to maintain a set of current charts.)
- Plotting Charts (These are simple charts used to maintain your location along a route and record information. As well as it is useful for plotting route changes and planning ETOPS. Jeppesen also sells plotting charts.)

Useful international flight publications are as follows:

- International Flight Information Manual  
<http://www.faa.gov/ats/aat/ifim/>
- International NOTAMS <http://www.faa.gov/ats/aat/ifim/>
- Federal Aviation Regulations  
<http://www.gpoaccess.gov/ecfr/>
- DoD Flight Information Publications  
<http://164.214.2.62/products/digitalaero/index.html>
- NOS Publications  
<http://www.naco.faa.gov/index.asp?xml=naco/index>
- FAA Advisory Circular 91-70  
[http://www.airweb.faa.gov/Regulatory\\_and\\_Guidance\\_Library%5CrgAdvisoryCircular.nsf/0/6F2169DFC98B711586256A5500568512?OpenDocument](http://www.airweb.faa.gov/Regulatory_and_Guidance_Library%5CrgAdvisoryCircular.nsf/0/6F2169DFC98B711586256A5500568512?OpenDocument)
- Reduced Vertical Separation Minimum  
<http://www.faa.gov/ats/ato/rvsm1.htm>
- ICAO Document 8168 Vol I Procedures for Air Navigation Services Pilots Operations Manual (Expensive)
- IATA Travel Information Manual (Expensive)

Finally for North Atlantic Oceanic Airspace the *North Atlantic MNPS Airspace Operations Manual* is available at <http://www.nat-pco.org/mnpsa.htm>

Those are the regulatory requirements for flying in international or special use airspace. Understand and applying the above is the key to international flight operations and during the course of instruction an entire 8 hour day was spent on just regulations. Annual regulation refresher training was also provided and highly recommended as the rules changed and knowing and complying with these changes were essential. However, in MSFS the good news is that no one is going to violate you for not knowing the regulations of the above. I will touch those topics that relate but I can not replicate the course of instruction that I received. Nor do I wish to bore pilots with hours of material that they may or may not be interested in. For a realistic flying experience I recommend that pilots look at the *International Flight Information Manual* and visit the VATSIM regions where you will be flying. Most of the VATSIM regions have a section for Pilots where good information is located. If we were going to plan a flight from KJFK to EGKK then we would want to check the New York and UK sites for preferred routing, oceanic and NAT information.

## Itinerary Planning

The first step in an international flight plan is the itinerary planning. For WestWind pilots this should be an easy step. As a simulated part 121 carrier the take-off and arrival times; flight plan and slot request; and coordination with various customs

agents has already been taken care of. WestWind's part 135/91 Executive Charters and part 121 Cargo operations would also take advantage of the airline's in house dispatch. However WestWind does not have a dispatch center and except for fly-ins much of the preflight work is left to the Captain. The first step in the Itinerary planning is to determine your Time of Touchdown (Arrival time.) This may be based on when someone needs to arrive in a specific city or based on your take-off time. We may not be able to get the individual at his location when he wants; local flight restrictions could require us to land earlier or later than originally conceived. Such as noise abatement. In any case we will have a set of city pairs to fly, they may be our major hubs for our airline and cargo pilots or other airports depending on the needs of the client. So let's look at a set of city pairs. In this case we will be examining the flight preparation for our part 121 operations, passenger and cargo. (We will also discuss our part 135/91 charter ops as well.)

We have bid and have successfully been assigned to fly WestWind's Boeing 767-300ER from New York's KJFK to London's EGKK. Dispatch tells us the flight is scheduled for 7+11. Normally we would take winds aloft into consideration, but here we will introduce flight simulatorism. Because we can not depend on the accuracy of MSFS winds aloft we will add a forecast head wind and ignore tail winds. This gives us a worst case scenario. Since we are flying to the east the prevailing winds are generally from the west thus we would have a tail wind which we have ignored. In the real world we would want to get the most accurate data available so we can prepare an accurate flight plan. The 7+11 is a takeoff to landing estimate but does not include an approach so we will add in the extra +15 minutes we can expect for the approach plus we want to add an estimate taxi time as well. Both JFK and GKK are large airports and a 10 to 15 minute taxi at each airport would not be unheard of. We can also check to see if either airport is expecting ground delays. We add it 35 minutes to our 7+11 and we have a door closed to door open time of 7+46. Now comes the fun part. This is the prime flight to London and we want it to arrive in time for people to have a full day to conduct business. We want our passengers to be walking out of the airport at 08:00AM London time giving them an hour to arrive at any meetings they may have. With an estimate of up to 1+30 minutes for customs we need to open the door on our 767 at 06:30AM London time. First we convert our time into GMT or Zulu time. The World Time Clock at: <http://www.timeanddate.com/worldclock/full.html> will help you. Currently London and the US are observing DST. We then calculate our block times then convert back to local times. See the spreadsheet below.

City	Hours from GMT		Door to Door Time
New York	-4	4:00	7:46
London	1	1:00	
	Local	GMT	
Depart Time	4/14/2004 19:44	4/14/2004 23:44	
Arrival Time	4/15/2004 6:30	4/15/2004 7:30	

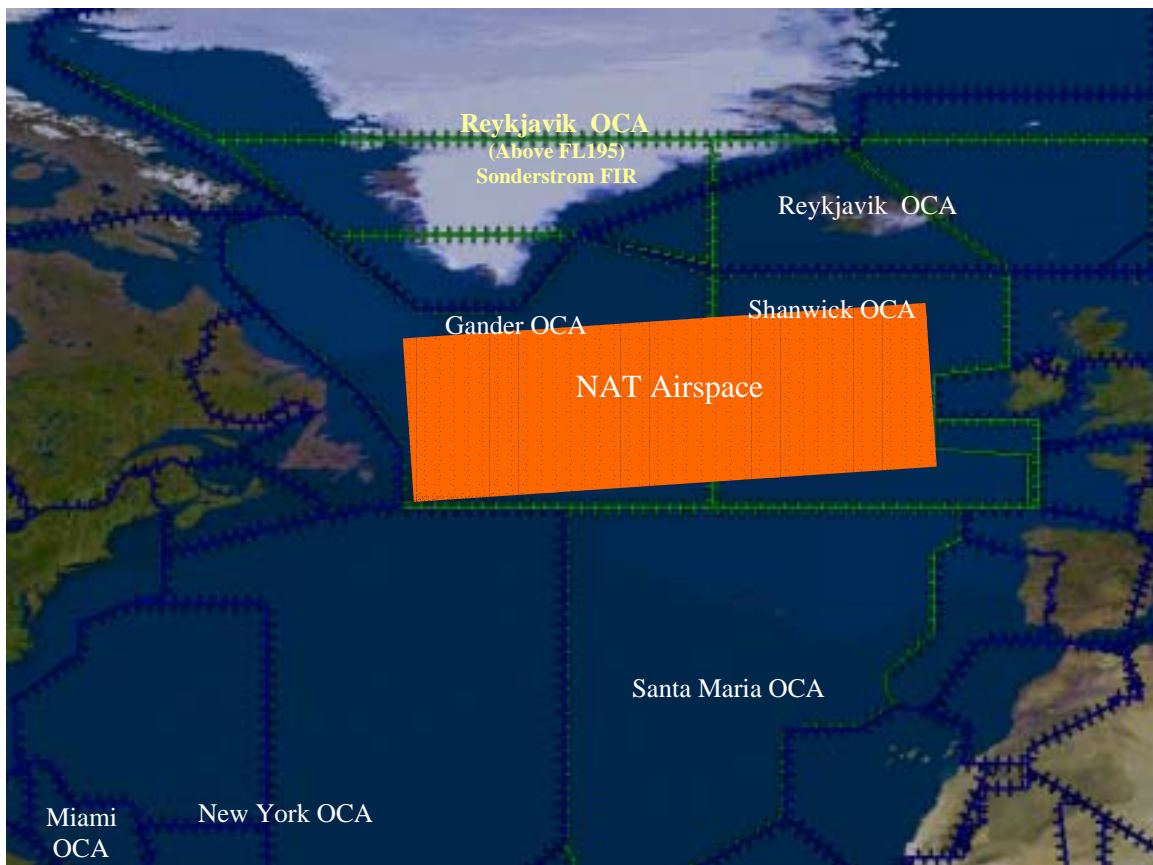
Based on our calculations then we need to close the door on our airplane at 19:44 to arrive in London the next morning at 06:30. Of course the WestWind dispatcher would

have told us this and we would only need to check his math. We would now be able to pass a message to UK customs to meet the airplane at 06:30 on the 15<sup>th</sup> of April 2004.

## Flight Planning

Itinerary planning and flight planning go hand in hand. You can not complete the first step with out working out your flight time. But before we can conduct out flight planning we must also understand the airspace that we will be flying through.

In this case we will start off in New York's Airspace, transition to Boston's, Moncton and Gander prior to reaching our Oceanic Clearance. At about CYMON we can expect Gander FIR to have us contact Gander Oceanic for our Oceanic clearance. In the case of our 767 flight we will be flying one of the North Atlantic Tracks or (NATs.) The NATs is a block of airspace from FL285 to FL410 which sees the heaviest volume of traffic between Europe and North America. Because of the volume of traffic the NATs become one way during parts of the day, once heading east to Europe and once heading west to North America. To fly our 767 in the NATs we must comply with three other requirements. The first is that our airplane must meet Minimum Navigation Performance Specifications (MNPS.) In order to accommodate more traffic in the NAT ICAO

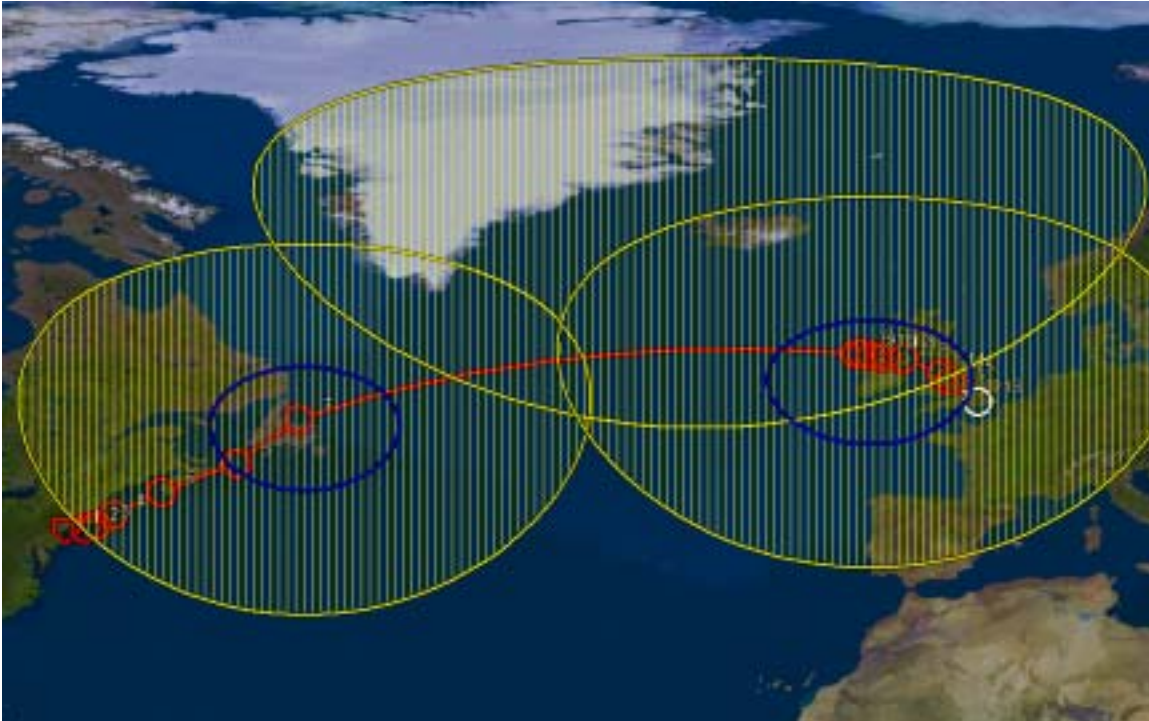


has determined that airplanes must meet specific performance specifications for long range lateral navigation. This allowed NAT planners to reduce the lateral separations of

tracks and increase the amount of traffic. The other specification that we must meet is Reduced Vertical Separation Minimum. By reducing the separation of aircraft from 2,000' to 1,000' the NAT planners were able to double the traffic in the NAT. Long range navigation may take the presence of GPS with current RAIM, INS, or LORAN-C. Pilot's using the default GPS will have nothing to worry about, as this system will keep you on course with little regard to actual satellite coverage. There are other third party GPSs that will simulate GPS outages. If you are using one of these more advanced GPSs then you will need to read the manual that came with the software to determine how to perform a RAIM check or disable simulated outages. CIVA produces an excellent version of the Carousel IV INS that was used on many early 707s, 727s, and even the Concorde. For these systems to meet Required Navigation Performance (RNP) specifications they must be updated by some outside source. Carousel IVs can be updated either manually, via VORDMEs, or GPS. The CIVA version may be updated either by VOR or Manually. Manual updates are not sufficient for flight into MNPS airspace. Thus if you planning on using the Carousel IV as your sole source for oceanic crossing you will need to plan to be within the range of a VOR at least once every 1+30 or use triple mixing. I do not know of any software that emulates LORAN C or GLONASS but both may also be used. (LORAN C is falling out of service.) Where as RNP covers lateral navigation RVSM covers vertical. RVSM is a set of systems that allows for the reduction of separation minimums. The heart of the system is digital altimeters that are much more sensitive than regular altimeters. These must be tied into an autopilot system and coupled with TCAS version 7.0. Error between to digital altimeters can be no more than 70'. As the US is planning to incorporate RVSM starting in 2005 all WestWind aircraft larger than 12,500 pounds and with an operational altitude over FL280 have been modified to RVSM compliance. It is very important to maintain proper altitude under RVSM as an aircraft in a contingency situation or on a random route will generally only have a separation of 500'. Aircraft unable to meet these requirements must fly outside of the NAT airspace. The most popular route is known as the Northern route that is flown from Canada, Greenland, Iceland, and finally Scotland. There is even a provision for flights along this route for those aircraft without Hf radios.

Since we are flying the 767 we must consider one other requirement. Since this is a twin engine aircraft it must follow the requirements of Extended Twin Operations. The 767-300ER has been certified for an enormous 180 minutes of ETOPS which allows us to fly the airplane up to 180 minutes from an ETOPS alternate airfield. An ETOPS alternate airfield is an airfield that can be used as a landing airfield in case of an emergency situation. ETOPS airfield selection must meet the selection requirements as an alternate airfield, it must have a runway of sufficient length, for passenger operations have an operating terminal, and must have weather that would allow the airfield to be used during the period of time that the airplane is in its ETOPS range. Under most situations our 767 could use Gander, Keflavik and Shannon. We must remember that in planning our 180 minute range that we are single engine and thus will have a reduced single engine cruise airspeed.





In the above image I show our flight from KJFK to EGKK. The red line represents our route, where the blue circle around Gander that intercepts our route in oceanic airspace is where we will enter our ETOPS Area of Operation. This point is called the ER entry point (EEP.) The yellow hashed area is 180 minute circles around our three ETOPS alternate airfields (this is a no wind condition) finally where the blue circle around Shannon and the red route line intersect again is the ER exit point (EXP.) The only other ETOPS calculations we must make are our Equal Time Points (ETPs.) Equal Time Points are points along our route in which the time is equal for us to proceed either back to Gander or on to Keflavik / back to Keflavik or on to Shannon.

The route can be divided into three distinct sections, the domestic departure from KJFK, the over water section and entry into NAT airspace, and the domestic arrival into EGKK. Large airports such as KJFK and EGKK will have preferred route. For VATSIM the New York ARTCC has a good planner at: [http://www.nyartcc.org/route\\_central/NAT/index.htm](http://www.nyartcc.org/route_central/NAT/index.htm) another option is the PM Flight Planner at: <http://www.pmfpl.com/> you will have to register. For offline planning FSBuild2 offers a good solution.

We'll take the routing by chunks, the first part is the Domestic Departure, but we can not plan that with out knowing our NAT route, so we will plan the NAT route first. Depending on what you use to plan you may either use static NATs or the real world daily NATs. Looking at the real world NATs at <https://www.notams.jcs.mil/> **North Atlantic Tracks** we can look at the track message. I have downloaded a message and highlighted the information we need.

041430 KCFCZDZX

ATCSCC ADVZY 014 DCC 07/04/04 ROUTE NAT RQD

ZBW NORTH ATLANTIC ADVISORY FOR 07/04/04 2000Z - 07/05/04 0500Z

AIRCRAFT DEPARTING JFK PLEASE FILE THE FOLLOWING ROUTES TO MINIMIZE DEPARTURE DELAYS DESTINED TO EUROPE:

TRACK S/ JFK.GREKI3.MARTN..QUBIS.N227B.LOMTA.TRAKS  
TRACK T/ JFK.MERIT3.PUT..BOS..BRADD.N45B.COLOR.TRAKT  
TRACK U/ JFK.BETTE3.ACK..KANNI.N37B.BANCS.TRAKU  
TRACK V/ JFK.BETTE3.ACK..WHALE.N29B..RAFIN.TRAKV  
TRACK W/ JFK.HAPIE3..YAHOO..VITOL.N21C.JAROM..BOBTU.TRAKW  
TRACK X/ JFK.HAPIE3.YAHOO..DOVEY.TRACKX

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AIRCRAFT DEPARTING EWR PLEASE FILE THE FOLLOWING TO MINIMIZE DEPARTURE DELAYS GOING TO EUROPE:

TRACK S/ EWR..MERIT..HFD..PUT..ENE..QUBIS.N227B.LOMTA.TRAKS  
TRACK T/ EWR..MERIT..HFD..PUT..BOS..BRADD.N45B.COLOR.TRAKT  
TRACK U/ EWR..MERIT..HFD..PUT..BOS..KANNI.N37B.BANCS.TRAKU  
\*\*\*\* PART 1 OF LONG MESSAGE (03 PARTS) \*\*\*\*  
703-708-5118!

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032031 EGGXZOZX

(NAT-1/2 TRACKS FLS 310/390 INCLUSIVE

JUL 04/1130Z TO JUL 04/1900Z

A ERAKA 59/20 59/30 58/40 56/50 SCROD VALIE  
EAST LVLS NIL  
WEST LVLS 310 320 330 340 350 360 370 380 390  
EUR RTS WEST ETSOM  
NAR N242B N248C N250E N252E N254A N256B N258A N260A-  
B GOMUP 58/20 58/30 57/40 55/50 OYSTR STEAM  
EAST LVLS NIL  
WEST LVLS 310 320 330 340 350 360 370 380 390  
EUR RTS WEST GINGA  
NAR N224E N228B N230C N232E-  
C MIMKU 57/20 57/30 56/40 54/50 CARPE REDBY  
EAST LVLS NIL  
WEST LVLS 310 320 330 340 350 360 370 380 390  
EUR RTS WEST MORAG  
NAR N202B N206C N210E-  
D NIBOG 56/20 56/30 55/40 53/50 HECKK YAY  
EAST LVLS NIL  
WEST LVLS 310 320 330 340 350 360 370 380 390  
EUR RTS WEST NURSI  
NAR N180B N188B N192C-  
E KORIB 55/20 55/30 54/40 52/50 CRONO DOTTY  
EAST LVLS NIL  
WEST LVLS 310 320 330 340 350 360 370 380 390  
EUR RTS WEST BABAN  
NAR N160C N164B-  
REMARKS.



1. TRACK MESSAGE IDENTIFICATION NUMBER IS 186 AND OPERATORS ARE REMINDED TO INCLUDE THE TMI NUMBER AS PART OF THE OCEANIC CLEARANCE READ BACK.
2. MNPS AIRSPACE EXTENDS FROM FL285 TO FL420. OPERATORS ARE REMINDED THAT SPECIFIC MNPS APPROVAL IS REQUIRED TO FLY IN THIS AIRSPACE. IN ADDITION, RVSM APPROVAL IS REQUIRED TO FLY BETWEEN FL290 AND FL410 INCLUSIVE.
3. EIGHTY PERCENT OF GROSS NAVIGATION ERRORS RESULT FROM POOR COCKPIT PROCEDURES. ALWAYS CARRY OUT PROPER WAY POINT CHECKS.
4. OPERATORS SHOULD REFER TO EGGX NOTAM G0179/04 FOR OFFSET PROCEDURES.-

**041343 CZQXZQZX**  
**(NAT-1/2 TRACKS FLS 310/400 INCLUSIVE**  
**JUL 05/0100Z TO JUL 05/0800Z**

S LOMTA MOATT 60/50 60/40 59/30 57/20 NIBOG NURSI  
EAST LVLS 320 330 340 350 360 370 380 390 400  
WEST LVLS NIL  
EUR RTS WEST NIL  
NAR N227B-

T COLOR RONPO 47/50 49/40 51/30 52/20 LIMRI DOLIP  
EAST LVLS 320 330 340 350 360 370 380 390 400  
WEST LVLS NIL  
EUR RTS WEST NIL  
NAR N45B N49A-

U BANCS URTAK 46/50 48/40 50/30 51/20 DINIM GIPER  
EAST LVLS 320 330 340 350 360 370 380 390 400  
WEST LVLS NIL  
EUR RTS WEST NIL  
NAR N37B N41C-

V RAFIN VODOR 45/50 47/40 49/30 50/20 SOMAX KENUK  
EAST LVLS 320 330 340 350 360 370 380 390 400  
WEST LVLS NIL  
EUR RTS WEST NIL  
NAR N29B N33C-

**W JAROM BOBTU 44/50 46/40 48/30 49/20 BEDRA GUNSO**  
EAST LVLS 320 330 340 350 370 380 390 400  
WEST LVLS NIL  
EUR RTS WEST NIL  
NAR N21C N25B-

X DOVEY 42/60 43/50 44/40 44/30 44/20 MUDOS STG  
EAST LVLS 330 350 370  
WEST LVLS NIL  
EUR RTS WEST NIL  
NAR NIL-

**041343 CZQXZQZX**  
**(NAT-2/2 TRACKS FLS 310/400 INCLUSIVE**  
**JUL 05/0100Z TO JUL 05/0800Z**

Y BALOO 36/60 41/50 43/40 46/30 48/20 48/15 ETIKI REGHI  
EAST LVLS 310 340 380  
WEST LVLS NIL  
EUR RTS WEST NIL  
NAR NIL-

Z 31/60 39/50 42/40 45/30 47/20 47/15 SEPAL LAPEX  
EAST LVLS 310 340 380  
WEST LVLS  
EUR RTS WEST NIL  
NAR NIL-

REMARKS:

1. TRACK MESSAGE IDENTIFICATION 187 AND OPERATORS ARE REMINDED TO INCLUDE THE TMI NUMBER AS PART OF THE OCEANIC CLEARANCE READ BACK.
2. CLEARANCE DELIVERY FREQUENCY ASSIGNMENTS FOR AIRCRAFT OPERATING FROM MOATT TO BOBTU INCLUSIVE:  
MOATT TO SCROD 128.7  
OYSTR TO CYMON 135.45  
YQX TO YYT 135.05  
COLOR TO BANCS 128.45  
RAFIN TO BOBTU 119.42
3. 80 PERCENT OF GROSS NAVIGATIONAL ERRORS RESULT FROM POOR COCKPIT PROCEDURES. ALWAYS CARRY OUT PROPER WAYPOINT CHECKS.
4. NAT EASTBOUND FLIGHT PLANNING RESTRICTIONS IN FORCE REFER TO EGGX G0182/04.

For us the track message gives us the domestic departure:

JFK.HAPIE3.YAHOO.VITOL.N21C.JAROM.BOBTU.TRAKW

For a look at the HAPIE3 DP we can go to:

<http://www.myairplane.com/databases/approach/index.php>

N21C is an air route between VITOL, LOMPI and JAROM

Finally we need to plan the domestic arrival portion of the flight. NYARTCC site told us to expect a willo STAR checking the UK site for the United Kingdom Standard Route Document (UK SRD) found it unavailable. If you live in the UK you can logon to [www.ais.org](http://www.ais.org) and register for access. I was able to find it on Jeppesen at: [http://www.jeppesen.com/wlcs/index.jsp?section=resources&content=special\\_pubs.html](http://www.jeppesen.com/wlcs/index.jsp?section=resources&content=special_pubs.html)

In this case we are coming in below the normal arrival gates for the UK and there is no standard route, thus we will file for the WILL1D into EGKK and be prepared to be diverted on arrival. Flight plan is at the end of this document.

Now that we have our route we can plan for our fuel. For a detailed description of fuel planning see my earlier lesson on Part 121 fuel planning.

Finally we need to make sure that our NAT times are good. We are departing NY at 19:44 + 15 minutes taxi time for a 19:59 departure time. We will enter track W after 1+57 flight time. Thus our entry time is: 21:56 New York Time or 01:56Z. Track W is inclusive for East bound traffic starting 01:00Z so thus our entry time is good. Our exit time is 06+13 minutes of flight time or 06:12Z which keeps our entry and exit times within the inclusive times of the NAT tracks. Thus we are good. What would have happened if we fell out of the inclusive times? As long as we were not in the inclusive time for West bound traffic then we fly our hemispherical altitude for IFR operations, if we did fall into the West bound inclusive time then we could not fly track W, we must either fly above or below NAT altitudes on a random route of fly a random route that keep us 30nm clear of any track. If we started in a noninclusive time and some point during the route we become west bound inclusive then we would select either the northern most or southern most track and prior to the inclusive time we would exit the NAT system and fly a random route. If we started noninclusive and at some point become eastbound inclusive all that means is more altitudes open up for our operations.

## Contingency Maneuvers

Twin engine jetliners are great except when you loose on of those engines. An airliner that can cruise effortlessly at FL410 with both engines turning, will invariably come down to thicker air when one of those engines goes south. In the NAT with traffic all around you and without the benefit of radar ATC has you sequenced by time and space. Even if you can maintain altitude on one engine it is unlikely you will be able to maintain cleared airspeed. So how are you going to exit this superhighway in the sky when the airplane can no longer maintain route, airspeed or altitude? Squawking emergency and talking on 121.5 won't cut it.

If an aircraft is unable to continue flight in accordance with ATC clearance, a revised clearance shall, whenever possible, be obtained prior to initiating any action. However, we must also consider the urgency of the situation, if you are cleared at Mach .80 then there is a good chance that another airplane is also following you at Mach .80. In that case you need to exit the route. Other emergencies that might require immediate action is rapid depressurization, in-flight fire, ect. In any case if ATC clearance can not be obtained at the earliest possible time ATC clearance will be obtained. The pilot shall:

- Broadcast position (including the air traffic route [ATS] route designator or track code, as appropriate) and intentions on frequency 121.5 at suitable intervals until ATC clearance is received, use 123.45 as a back-up
- Make maximum use of aircraft lights to make the aircraft visible
- Maintain watch for conflicting traffic (set TCAS to 40 miles)
- Initiate such action as necessary to ensure the safety of the aircraft

If unable to maintain ATC track clearance (altitude, airspeed, or track alignment) the aircraft will leave its assigned route or track by turning 90 degrees to the right or left whenever possible. The direction of turn should, where possible, be determined by the position of the aircraft relative to any organized route or track system (e.g., whether the aircraft is outside, at the edge of or within the system). Other factors that may affect the direction of the turn are the direction of an alternate airport, terrain clearance and levels allocated to adjacent routes or tracks.

- A. An aircraft able to maintain its assigned flight level should:
  - 1. turn to acquire and maintain in either direction a track laterally separated by 30 nm from its assigned route or track
  - 2. if above FL 410, climb or descend 1,000'
  - 3. if below FL 410, climb or descend 500'
  - 4. if at FL410, climb 1,000' or descend 500'
- B. An aircraft not able to maintain its assigned flight level should:
  - 1. initially minimize its descent rate to the extent that is operationally feasible
  - 2. turn while descending to acquire and maintain in either direction a track laterally separated by 30 nm from its assigned route or track
  - 3. for the subsequent level flight, a level should be selected that differs from those normally used by 1,000' if above FL 410 or 500' if below FL 410

The above procedures will get you off of the track system. If you must fly to an alternate airport then you will first fly the above procedure, attempting to receive ATC clearance. If unable to contact ATC you will climb to an altitude that is either above or below the route structure (FL 285 to FL 410). You will then offset that altitude by 500' if below FL 410 or 1,000' if above FL 410. If you must cross the OTS at track altitudes then maintain 500' offset and fly toward your alternate, obtain ATC clearance as soon as possible.

These are ICAO procedures; if you fly online then you should check with the agency you fly with on their rules for emergency situations. Some like VATSIM will only allow an emergency if ATC accepts and it does not interfere with other traffic. If you have a situation that requires a contingency maneuver you may be required to log off first. MSATC will generally not care and you can file a new flight plan to your alternate or cancel IFR. As MSFS AI traffic does not fly the OTS you should be on the look out for crossing traffic as well.



FSBUILD FLIGHT PLAN

FLT REL IFR KJFK/EGKK MACH 80 A/C B767-300ER W/ PW4060

	FUEL	TIME	CORR	TOGWT	LDGWT	AVG W/C
TAXI	001200	0025	. . . .	333821	260557	P000
DEST EGKK	073264	0711	. . . .			
RESV	006783	0045	. . . .			
ALTN	002374	0015	. . . .	ALTN EGLL	DIST 22	
HOLD	000000	0000	. . . .			
EXTRA	000000	0000	. . . .	ZFW 251400		PAYLOAD 047000
TTL AT TO	082421	0811	. . . .			DIST 3197
REQD	083621	0836	. . . .			

CLB BIAS 0.0 % CRZ BIAS 0.0 % DSC BIAS 0.0 %

KJFK YAHOO VITOL LOMPI JAROM TRAKW REGHI GIBSO WILL1D EGKK/0711

TO	NM	AWY	M/H FL	M/C	TAS	G/S	ZT	ACTME	WIND	ATC	ETA	ATA	ACBO	ABO	REM	AREM
N4030.7/W7133.8			093 CLB						000000	BOS						
TOC	101	DCT	093	342	342	00/17	00/17	...	...	0078/...	0746/...					
N4104.1/W6944.7			095 370						000000	BOS						
YAHOO	083	DCT	095	459	459	00/10	00/28	...	...	0097/...	0726/...					
N4147.0/W6700.0			084 370						000000	BOS						
VITOL	130	DCT	084	459	459	00/16	00/45	...	...	0127/...	0696/...					
N4400.0/W5700.0			086 370						000000	NY_O						
LOMPI	458	DCT	086	459	459	00/59	01/45	...	...	0234/...	0590/...					
N4410.0/W5453.0			103 370						000000	NY_O						
JAROM	091	DCT	103	459	459	00/11	01/57	...	...	0255/...	0568/...					
N4407.0/W5249.3			111 370						000000	NY_O						
BOBTU	089	TRAKW	111	459	459	00/11	02/08	...	...	0274/...	0549/...					
N4400.0/W5000.0			112 370						000000	NY_O						
4450N	121	TRAKW	112	459	459	00/15	02/24	...	...	0300/...	0523/...					
N4700.0/W4000.0			082 370						000000	CZQX						
4740N	457	TRAKW	082	459	459	00/59	03/24	...	...	0399/...	0425/...					
N4800.0/W3000.0			095 370						000000	CZQX						
4830N	409	TRAKW	095	459	459	00/53	04/17	...	...	0484/...	0339/...					
N4800.0/W2000.0			100 370						000000	EGGX						
4820N	401	TRAKW	100	459	459	00/52	05/10	...	...	0568/...	0255/...					
N4800.0/W1500.0			098 370						000000	EGGX						
4815N	200	TRAKW	098	459	459	00/26	05/36	...	...	0608/...	0215/...					
N4800.0/W0845.0			095 370						000000	EGGX						
ETIKI	250	TRAKW	095	459	459	00/32	06/09	...	...	0658/...	0166/...					
N4800.0/W0800.0			094 370						000000	EGGX						
REGHI	030	TRAKW	094	459	459	00/03	06/13	...	...	0663/...	0160/...					
N5015.3/W0249.4			055 370						000000	LON						
TOD	252	DCT	055	459	459	00/32	06/46	...	...	0713/...	0110/...					
N5044.9/W0231.1			053 DSC						000000	LON						
GIBSO	017	DCT	053	300	300	00/03	06/49	...	...	0715/...	0108/...					
N5045.5/W0148.6			090 DSC						000000	LON						
BEWLI	027	WILL1D	090	300	300	00/05	06/54	...	...	0718/...	0105/...					
N5045.7/W0114.1			092 DSC						000000	LON						
BEGTO	021	WILL1D	092	300	300	00/04	06/59	...	...	0720/...	0103/...					
N5049.2/W0056.3			073 DSC						000000	LON						
AVANT	012	WILL1D	073	300	300	00/02	07/01	...	...	0722/...	0101/...					
N5051.3/W0045.4			075 DSC						000000	LON						

GWC 114.75	007 WILL1D	075	300	300	00/01	07/02	.../...	0723/...	0101/...
N5053.2/W0005.7		087	DSC				000000	LON	
HOLLY	025 WILL1D	087	300	300	00/05	07/07	.../...	0725/...	0098/...
N5059.1/W0011.5		329	DSC				000000	LON	
WILLO	007 WILL1D	329	300	300	00/01	07/09	.../...	0726/...	0097/...
N5108.8/W0011.8		002	DSC				000000	LON	
EGKK	009 WILL1D	002	300	300	00/01	07/11	.../...	0732/...	0091/...