

# DELTA FLY!

DECEMBER 2005





## Delta Fly DECEMBER ISSUE

### From the President's Desk

November 2005

Last month I informed you of the increases in membership and website activity. The growth trend continues. With our popularity and associated higher levels of page views, it was found that our web-hosting using shared database servers was unable to process our needs resulting in slow response and timed out database calls.

DVA2006 was moved early in November from the shared sever to a dedicated top of the line 3 Ghz Pentium IV SuSE Linux server, with 2GB of memory and 100GB of storage space. The cutover was accomplished in record time thanks to our talented Webmaster Luke Kolin. The new server is faster and more reliable.

As I reported our next major initiative is the creation of a Flight Academy under George Lewis's direction. George Lewis has been busy establishing the mentor system to support one-on-one pilot training and troubleshooting. He will report separately the achievements of his mentors and students. A draft of his Private Pilot License certification unit has undergone real world pilot reviews. Signups will be available shortly for those interested in additional certifications.

Global Virtual Airlines Group was created to accept voluntary contributions for paying DVA's expenses. A structure was created to fairly share in the payment for the hosting services and bandwidth. The initial offering of 180 shares at \$10 each was fully subscribed.

The funds will be sufficient to pay expenses until September 2006. A separate website is being designed to recognize those who voluntarily contributed to Global Virtual Airlines Group.

Your staff is working hard with the emphasis on enhanced enjoyment of virtual aviation. The key word is enjoyment. Please provide feedback as to how you would like your experience enhanced. If it fits our business model, we will do our best to incorporate your ideas.

As we are in the holiday season, I wish you and your loved ones joy, peace, happiness and good health as we enter a New Year. I also hope that you receive that much-desired latest add-on or new piece of hardware that will bring you one step closer to the real thing during this season of gift giving.

Thank you for flying Delta Virtual Airlines,

Terry Eshenour  
President, Senior Captain 777

**FROM THE EDITOR**

By Matt Reamy

Welcome to the December issue of FLY. It's nice to see feedback from you all, positive or otherwise. While positive feedback is a bit more rewarding, if there were no other type, this would rapidly become a useless publication.

I urge you to contact us through our email, [delta\\_fly\\_mag@hotmail.com](mailto:delta_fly_mag@hotmail.com). While we didn't get too many regular "Letters to the Editor," I would like to make a correction brought up by one pilot. I stated that, while on the CAMRN4 STAR, the pilot will get vectors after the DPK VOR. Jeremy Milligan, one of our new pilots who was paying attention correctly brought to my attention that vectors are given at the CAMRN intersection. Good catch, and thanks Jeremy.

Well it's a sad era for fans of Delta Airlines. After fighting bankruptcy for several months, Delta is faced with cutting costs reducing their fleet. Among others, one of the aircraft that's being retired is the Boeing 767-200. One thing that makes DVA a great Virtual Airline is that we keep our classic aircraft for those who enjoy flying them.

So what have we got for you guys this month? Gaston's written a memoir about two recently retired pilots who mentored him early on. Chris Williams has written a quick tutorial on the PMDG 737-800's Flight Management Computer for those of you who want to "get in and go." Chris will be working with George Lewis on the 738's FMC course in the Delta Flight Academy.

Speaking of George, he's found the time in his busy schedule to continue his tutorial on navigation; this month he talks about the Non-Directional Beacon. With all the newer forms of flight navigation available, it's easy to ignore the NDB as a useful NAVAID; but it's still quite widely used, if not in the US, in other parts of the world.

I continue my flight planning series with the Standard Instrument Departure. When sitting down to write the article, I wondered if I would even have enough to say about it and considered including the segment on STARS as well. It turns out that I shouldn't have worried.

Changing gears for a minute, as we're now in the grip of the holiday season, I'd like to say stay safe and be responsible. While we're able to simply reset a boo-boo while we're flying our Passengers and Crew in the Flight Sim world, it's not so easy to do that in the real world.

Keep the feedback coming. FLY was restarted to help you guys learn new things, or to make old things more clear. Our only gauge of how well we're doing is to hear from you!

Happy Holidays  
Matt Reamy  
Editor



## From the Flight Academy

by George Lewis

Last month I gave an overview of navigation and why we need to learn the basics. I briefly covered NDB, VOR and DME. I mentioned that a full NDB tutorial would be coming soon. This month's navigation lesson will be learning how to use the NDB with the ADF receiver in the airplane.

We will be using the DVA Embraer EMB-120 in the flight academy. The first course available to DVA members will be the PPL (Private Pilots License) Course. In this course one of the things we will teach you is how to fly using the NDB. If you enjoy this article, you will enjoy the PPL course.

### How to fly to the NDB

You use the ADF (automatic direction finder) receiver in the airplane to tune in the NDB (non-directional beacon) station. The ADF always points to the NDB station, so you can simply turn your airplane until the needle points forward in the direction you are heading until you fly over the NDB, at which point the needle swings around backwards, as it points back to the NDB you just flew past.

We use the NDB not only as a navigational aid but also to provide better situational awareness when flying. An NDB has no radial or mileage information. We simply use the ADF to see where the NDB is located. The NDB isn't complicated and wasn't meant to be. It is a simple navigational aid that can be utilized by all pilots for cross county IFR and VFR navigation and also instrument approaches.



The ADF that we use on the DVA EMB-120 is built into the **RMI** (*Radio Magnetic Instrument*).

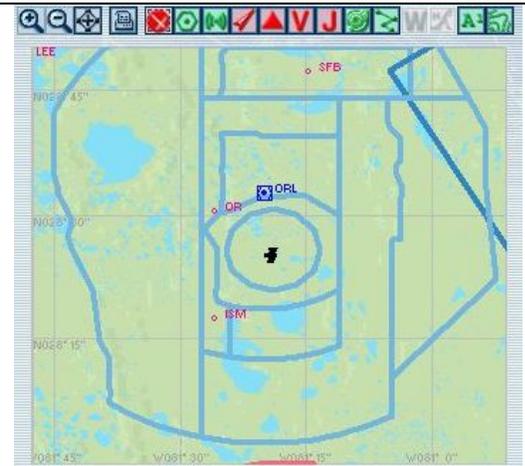
There are 2 needles on this instrument – the yellow one is the ADF and it is the only one we care about. When the ADF is not tuned to any NDB, the needle will point to the right.

The great thing about this is that if the airport has an NDB on the field, we can see where we are in relation to the airfield. This is a wonderful way to increase your situational awareness and help fight disorientation. It is also a real world flying technique used by real pilots.

Now we will demonstrate using the NDB to fly to KISM (Kissimmee, Florida) and fly the traffic pattern. We will start by looking at the Orlando airspace and pointing out the local NDBs and then go take off and fly to KISM using the NDB as our navigation aid and make an approach there.



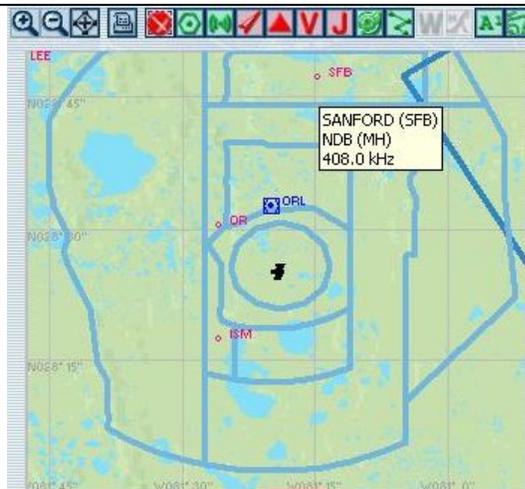
**The Orlando Airspace**  
Here is the Orlando Airspace with the airports showing on the map. There is a lot of clutter but you can zoom in to get better detail.



**The Orlando Airspace – filtered**  
Now you can plainly see the Orlando airspace in light blue and the ORL VOR in dark blue. The 3 red circles are the ISM, OR and SFB NDBs



**ISM NDB Highlighted**  
Here we have moved the mouse over the ISM NDB and you can see the NDB frequency for it.



**SFB NDB Highlighted**  
Here we have moved the mouse over the SFB NDB and you can see the NDB frequency for it.

These 2 airports – KISM and KSFB are great places to go fly maneuvers and do pattern work. We'll be visiting these 2 airports on a regular basis for flight instruction.

Now we will take off from runway 36L at KMCO and turn left and fly to KISM and enter a left downwind for runway 6.



### Taking off from KMCO Runway 36L

The EMB-120 is departing KMCO. Here we see that we are doing 189 KIAS, are climbing out at about a 5 degree pitch in attitude and have a 1500 fpm climb rate. The altitude is 760 feet and the altimeter setting is 30.27. We're running 100% power and the gear and flaps are up. Notice the trim indicator setting.

On the HSI it shows our heading and you can see a magenta colored line at the top and below – this is the ADF. To the left of this instrument and below the airspeed indicator is the RMI. The green needle is VOR2, which is currently tuned to 116.80 and is not picking up anything. It is in the “not tuned” position and will not move for the entire flight.

The yellow needle is the ADF and it is pointing to the NDB – directly behind us at heading 150. You can see on the ADF radio that we are tuned to 329.0, which is the ISM NDB.

Flying to this NDB will take us directly to the KISM airport.



### Turning left towards the ISM NDB

We are turning the EMB-120 in a coordinated level 45 degree banked turn. Notice that the NDB is to our left. It is still near the 150 heading, but since we have turned – currently around heading 240 now, that we can tell that the airport is to our left, slightly behind our airplane. This is also a good time to point out the turn. We are at 1380 feet and we are not using the autopilot. We won't normally make 45 degree turns in commercial flight – in fact you will probably never do this – but in training you will need to learn how to execute 45 degree turns. To the passenger, this would probably scare the living daylights out of them.



**On left downwind for KISM RWY 6**  
We are on a left downwind for KISM's runway 6



**Visual confirmation of our position**  
This is the same position as the cockpit shot; only we are looking out the left wing. As you can see, the airport is visually right where the ADF says it is.



**Close up of the RMI**  
The RMI shot here is a close up of the cockpit view above. You can see that the NDB is slightly behind us and to the left. This is great situational awareness. We are on a left downwind for runway 6



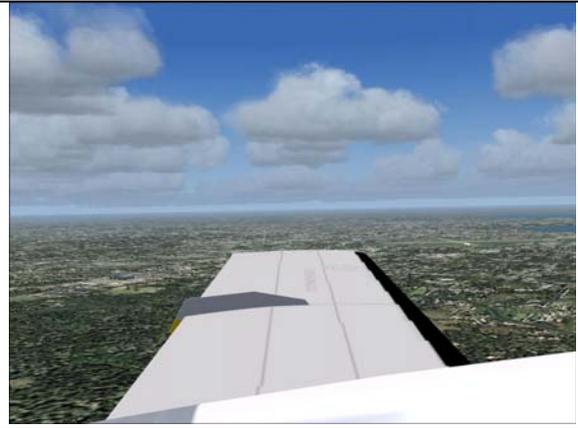
**Close up of the HSI**  
This instrument just backs up what the RMI is saying. If you were going to fly with the FD (flight director), the heading bug could be moved to where the ADF is pointing and the FD would point the way.

We are flying the pattern at Kissimmee airport. We entered a left downwind and used our ADF to help locate the NDB that is located at the airport. This helped us situate ourselves quite nicely and ensure we got the right airfield. Now we will fly the pattern visually but will use the ADF as a nice backup to the visual stuff because in flight simulator it is sometimes hard to see with peripheral vision.



**Left base for runway 6 at KISM**

You can see that we are still left of the runway – this time we are on base and descending fast – we entered the pattern a bit high. We can see that the NDB is slightly ahead of us and to the left.



**Visual confirmation of our position**

Here is the same shot – Runway 6 is just past the leading edge of the wing with the white lights. We will turn the airplane and follow the NDB to make sure we don't overshoot the runway on our turn.



**Close up of the RMI**

The RMI shot here is a close up of the cockpit view.



**Close up of the HSI**

This instrument just backs up what the RMI is saying.

As you can see, the RMI here gives us a great look at our situational awareness. If the visibility were considerably less, you might not see the runway very well in the wing view. The NDB is an effective tool at your disposal to help you increase your situational awareness on every flight. I personally note all the NDBs in the area at all 3 airports when I fly – departure, destination and alternate. I tune in the local NDB when departing and tune in the destination when I arrive in the area. It is an extra bit of awareness that could keep you from doing something stupid and it never hurts to know where you are in the sky.



### Final Approach at KISM's runway 6

The DVA EMB-120 Flight Academy bird is on final approach for runway 6 at KISM – Kissimmee airport. Note airspeed, VSI, flaps, gear and trim settings. Note the ADF position. We were able to find this airport all by ourselves with no assistance from the GPS, autopilot or 3<sup>rd</sup> party navigation software such as FSNAV. This is how we do it in the real world.

Now that you have seen how it is done, it is your turn. Take the DVA-EMB 120 up for a flight out of KMCO. Tune in 329.0 on the ADF and fly to KISM and make a landing. Then change the ADF to 408.0 and fly up to KSF (Sanford, Florida) and make a landing up there.

You now have the ability to use the NDB to find your way around in the skies. Keep in mind that the NDB is not as effective at high altitudes and that the range of an NDB is around 40NM or less.

In the Flight Academy PPL course we will not only cover what the NDB is and how to use it, but also how to fly direct to a VOR. Next month we'll cover this in great detail. Until then, email me with any questions you may have.

Happy Flying!

Questions about navigation can be sent to George at [delta\\_fly\\_mag@hotmail.com](mailto:delta_fly_mag@hotmail.com) with the subject Navigation.

**THE DELTA MUSKETEERS:****A Personal Look Back at a Great Era**

By Gaston Doval

Everything started back in 2003. Monsieur Haug and Herr Schaum, started the famous and long-lasting tradition of the Delta Musketeers. The Delta Musket, as everybody used to call them, was a series of events that gathered up several pilots to fly online a Sunday Night. The events started up, with just a few, but regular pilots. Within time, the number started to grow. Delta Virtual Airlines was experiencing a boom of pilots, and a boom of quality flying that we could boast about.

Ever since joining the VA in on September 14<sup>th</sup>, 2004 – I've flown almost every Musketeers on the events billboard. I can remember the first one. I was reviving my love to fly. I've had some harsh situations going on and I found it best to go and play with FS. I was only 1 month back to FS (I've flown since FS5.1), and only a week into online flying on VATSIM. I was practically a newbie. I remember the flight was SLC-SFO. It was the Delta Musketeers flight #50. The DC-10-10 was my newest rating and I was eager to do my second flight in it. It was around 7.30pm in Buenos Aires, and I had arrived from ATL an hour earlier in the DC-10-10, when everyone started to show up. The flight was due to depart at that time, but we waited along impatiently for any ATC to come up. No one controlled any of the ZLC (*Salt Lake Center*) positions. In order, we departed. I was the first one to takeoff off runway 31L at SLC. Flying with a keyboard, and only able to do text communications was and is very hard. Flying out as I could, I realized that I had no clue on how to fly a SID or a STAR. The big ole -10 was performing a sky rocket climb to an exaggerated flight level 310 that I chose for that flight, just to see the contrails.

ZOA (*Oakland Center*) contacted me as soon as reached I cruise. I couldn't help freaking out when they were asking things I wouldn't know. But magically, someone came to my rescue and it was, Monsieur Haug. In very basic words, and lessons (remember, we were still flying), Mr. Haug taught on how to read an SID/STAR chart and on how to fly the MODESTO2 STAR, particularly, as a demo. I did fly the STAR, with a lot of mistakes, but I

did it. I was certainly messing things around for ZOA.

I was almost near the path for the runway. I came in too high, so I just made the 10 dive and descend to the requested altitude. Now, cleared for a visual on 28L, I was trying to control the plane with my keyboard and chatting with Tom on SB 2.3. After a bumpy approach, I made it to the runway. When the nose touched down, Flight Simulator 2004 performed a crash to the Desktop and I was left without gather photo at the Terminal.

Several Musketeers and the Musketeers themselves have gone by since that experience. And Mr. Schaum and Mr. Haug, have both helped me out a lot in learning to fly again. I took some private lessons from Mr. Haug – whom I consider my mentor. And I owe him the virtual world I fly in. Herr Schaum has made these experiences a whole lot more enjoyable putting up these events.

Even though both Tom and David are now gone for different reasons, Delta Virtual Airlines has indeed seen their passing. Two wonderful members of this community are not forgotten. They have both left, even they are not gone completely, true people that are able to cope with their legacy and carry it on all along. So, for them I say:

Salute, Monsieur Haug!

Auf Wiedersehen, Herr Schaum!



**Goodbye GPS, Hello FMC!**

by Chris Williams DVA2086

You may have been a little shocked or surprised to see that the GPS available in most FS 2004 aircraft isn't available in the PMDG 737 series aircraft.

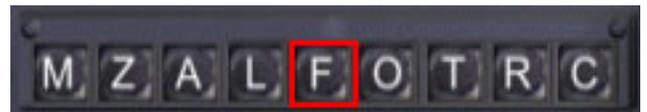
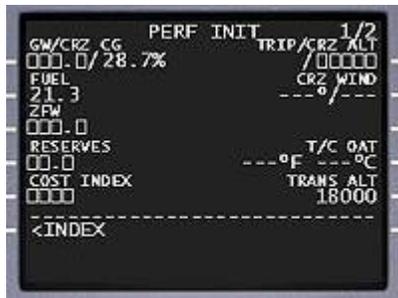
So how do you know where you're going or even better how does the Auto Pilot know where to fly?

Welcome to the wonderful world of FMC (Flight Management Computer). PMDG modeled the 737 after the real thing and in doing so incorporated a fully functional FMC. You're more than welcome to jump in the PMDG and go but if you want the lowdown on how to program a flight plan into the FMC, then you've come to the right place. I will show a series of FMC screenshots along with explanations in order to program a KATL – KCVG flight into the FMC.

I highly recommend Tim Metzinger's tutorial on the PMDG 737; at over 32mb, it is the most comprehensive and easy to understand tutorial out there. Contact me at [chris@designmojo.com](mailto:chris@designmojo.com) for a link to his tutorial. The goal of this article is just to familiarize you with the FMC itself; Fuel Planning, Take Off and Landings with the FMC are not covered in this article. If demand is strong, I will continue a series of articles on the PMDG 737.

Let's begin with our flight plan. We will be using the KATL NOTWO J43 VXV SWEED7 KCVG route. In this plan, we'll be using the SWEED7 STAR and the VXV transition into the STAR.

So prepare for some FMC Magic. All buttons to be pressed will be highlighted by a red box.



As with programming anything, there are certain data requirements that must be met. The FMC is no different. Whenever you see boxes as shown in the image above, it means that data is required there and must be inserted. Keep this in mind when programming the FMC for future flight.

Let's get started! ➤

To Begin, Press the "F" button within the cockpit. ➤



You will now be greeted by the first screen of the FMC.

To begin programming the FMC for our flight, Click the "FMC" button. ➤



This will bring you to the IDENT screen. Nothing is to be changed on this screen so go ahead and press the POS INIT button to continue. ➤



On the POS INIT screen, you'll want to enter the REF AIRPORT. Since we are taking off from Atlanta, we'll enter KATL. To do so, use the input keys to enter KATL and press the button next to REF AIRPORT to insert KATL.

Once you see KATL as shown above, go ahead and click the button next to ROUTE. On the next screen, we'll enter in our flight route. ➤

On the RTE or Route screen, you'll need to fill in the ORIGIN. Enter KATL as you did in the previous screen and click the button next to ORIGIN to input KATL.

You'll need to do the same with the Destination (DEST). Enter KCVG and press the button next to DEST.

The next step is to enter the Runway. This will help the FMC track itself to the next waypoint from take-off. In this example, I entered 27R and pressed the button next to runway to input the value. From here, go ahead and click the NEXT PAGE button as shown above. ➤



On this screen we will enter our route. We'll begin by entering NOTWO by using the input pad and then clicking the button next to the number 1 above. When you do this, DIRECT will show as the value for the button to the left. This is telling the FMC to fly direct to NOTWO from RWY 27R.

If you look at the flight plan, the next leg is J43. This is a Jetway. Enter J43 using the input keys and press the button next to number 2 as shown above. You'll see J43 populated there.

The next leg is VXV. Enter VXV using the input keys and pressing the button next to number 3 to enter the value.

From this screen, go ahead and click the ARR button for KCVG as show above. This will take us to the STAR information for KCVG. ➤



The FMC reads this as fly from NOTWO to VXV via J43.

At this point, let's go ahead and enter our STAR information.

Press the DEP ARR button as shown above. >



On this screen we see that the SWEED7 STAR is available. This is the same STAR from our flight plan so go ahead and select it by pressing the button next to SWEED7 as shown above. >

Once you have selected the SWEED7 STAR, it will show <SEL> as shown above. The next step is to select the Transition point to enter the STAR.

Looking at our flight plan it's VXV. Press the button next to VXV as shown above to select it. >



As you can see above, we have successfully selected the VXV.SWEED7 STAR. Go ahead and click the RTE button as shown above. ➤



We are back at the RTE or ROUTE page. If you notice, SWEED7 and CVG have been entered automatically. Go ahead and click the button next to Activate to save the ROUTE and activate it within the FMC. ➤



Once you clicked ACTIVATE, the EXEC button became active as seen from above.

Whenever a major change occurs within the FMC, you must authorize it again. Go ahead and click the EXEC button. ➤



Once you have clicked the EXEC button, you'll notice PERF INIT on the screen. Go ahead and click the button next to it. ➤



When you arrive to this screen, most of the information will be blank.

You will now see N1 LIMIT as seen from the graphic above.

To get started, we'll go in numeric order.

Go ahead and click the button next to it. ➤

Step 1: Click the button next to GW/CRZ CG. This will automatically fill in that section along with the ZFW section. This comes from what you entered in for the Payload section when you selected the PMDG 737 in the 'create a flight' screen.

Step 2: For RESERVES, I use 6.6 which is usually about an hour's worth of fuel. Enter 6.6 (including the period) using the input keys and press the button next to RESERVES to input that value.

Step 3: The COST INDEX number is a scale value from 0 to 1000 that helps to determine a level of economy for aircraft performance calculation. A low COST INDEX with slow climb rates and a maximum range cruise and slow descent speeds predicted by the FMC will minimize fuel burn. I've read over time that real life 737's use 45 to 65 as their COST INDEX. I usually just enter 45. Once you have entered a value using the input keys, press the button next to COST INDEX to insert it.

Step 4: The TRIP portion of the TRIP/CRZ ALT section will automatically get filled in when a COST INDEX is entered. What you do need to enter in this section is your CRUISE altitude. You can enter it as 35000 or 350. Enter the number using the input keys and press the button next to TRIP/CRZ ALT to insert that value.

Once you have completed this screen, click the EXEC button to save this information to the FMC.





In almost all instances, the default values selected will be fine for your flight plan. Consult the manual for more in depth information regarding the N1 LIMIT section. For right now, let's leave it as it is and press the button next to TAKEOFF. ➤

On the TAKEOFF REF screen, you'll need to enter the FLAPS setting. 5 degrees of flap is most often used so I recommend inputting 05 using the input keys and pressing the button next to FLAPS to insert the value.

Once you have done that, click the buttons next to V1, VR, and V2. Pressing each button will automatically fill in the speed next to each.

That's it! Pre-Flt is Complete. The only other thing to note on this screen is the TRIM. It's showing 4.90. You can trim your plane to this. This number is automatically calculated by the FMC. ➤

You have now successfully programmed the FMC for your flight plan. This was a short tutorial to get you started with the FMC. I recommend reading the manual for more specifics of the FMC and what each function does.

*Thank you, Chris, for your time. Any more FMC questions, please email us at [delta\\_fly\\_mag@hotmail.com](mailto:delta_fly_mag@hotmail.com) with the subject FMC.*

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*Delta NOC PMDG 738 coming into KSFO runway 28R. Just after FAITH we turned right and intercepted the localizer and glideslope for ILS 28R.*

*Photo by George Lewis*

## FLIGHT PLANNING FOR MS FLIGHT SIM – SIDS

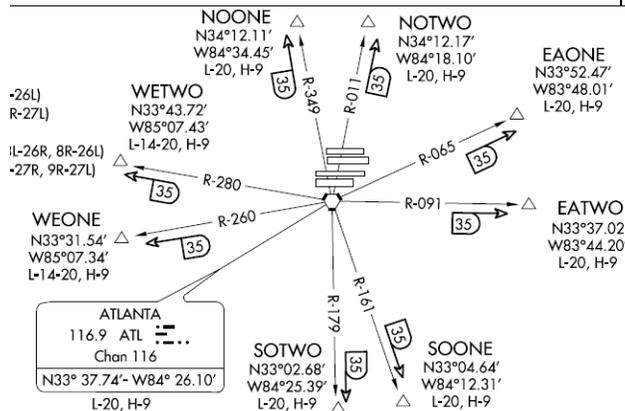
By Matt Reamy

Last month we covered the basics of a flight plan, including Standard Instrument Departures and Arrivals (SIDs and STARs), preferred routes, and Jet Airways. As the scope of this series is to familiarize DVA pilots with planning flights for flight simulator, we'll take some time to go a little deeper into the basic construction of a flight plan.

Let's take a moment to look at the flight plan we started out with last month: KATL-EATWO-GRD-J209-ORF-J121-SIE.CAMRN4-KJFK.

If you'll recall the basic breakdown here, we have the Departure Airport, the SID, the route, the STAR, and the Arrival Airport.

So you're planning a flight from Atlanta to New York's Kennedy Airport. As we discussed in the previous article, ATL5 is one of the simplest SIDs in use. Take another look at it:



ATL5 gives us eight transition intersections. These intersections correspond to points on the compass in

the general direction of your flight route. As you can see you'll fly outbound along the radials listed for 35nm. Once your DME reads 35nm, you're over your intersection.

Our flight plan calls for an EATWO transition, so we tune our navigation radio to the ATL VOR (116.9). Once we take off, we'll fly a heading of 091 until our DME reads 35.

In the event that you don't understand the visual depiction of the SID on your chart, there is a written description of the departure either on the page or on a following page. In this case, it's on the same page:

### DEPARTURE ROUTE DESCRIPTION

Turbojets maintain 10,000 (or requested altitude if lower), props maintain 4,000. Expect further clearance to filed altitude 10 minutes after departure. Maintain heading as assigned until vectored to appropriate VOR, airway, or jet route. Unless otherwise assigned, departure frequency for North runways (8L-26R and 8R-26L) - 125.7, South runways (9L-27R and 9R-27L) - 125.0. Transponder code will be issued via PDC or Atlanta Clearance Delivery.

**SPECIAL INSTRUCTIONS:** Midfield aircraft at ramps 1, 2, 3, 4, 5, and 6 will advise ramp towers of vector areas prior to pushback. The vector areas are associated with the depicted intersections as follows:

INTERSECTION	VECTOR AREA
EAONE	EAST-ONE
EATWO	EAST-TWO
NOONE	NORTH-ONE
NOTWO	NORTH-TWO
SOONE	SOUTH-ONE
SOTWO	SOUTH-TWO
WEONE	WEST-ONE
WETWO	WEST-TWO

Any aircraft receiving clearance via PDC may monitor Atlanta departure ATIS for departure runway. Upon receipt of ATC, clearance (from Atlanta Clearance Delivery), read back only your call sign and transponder code, unless you have a question.

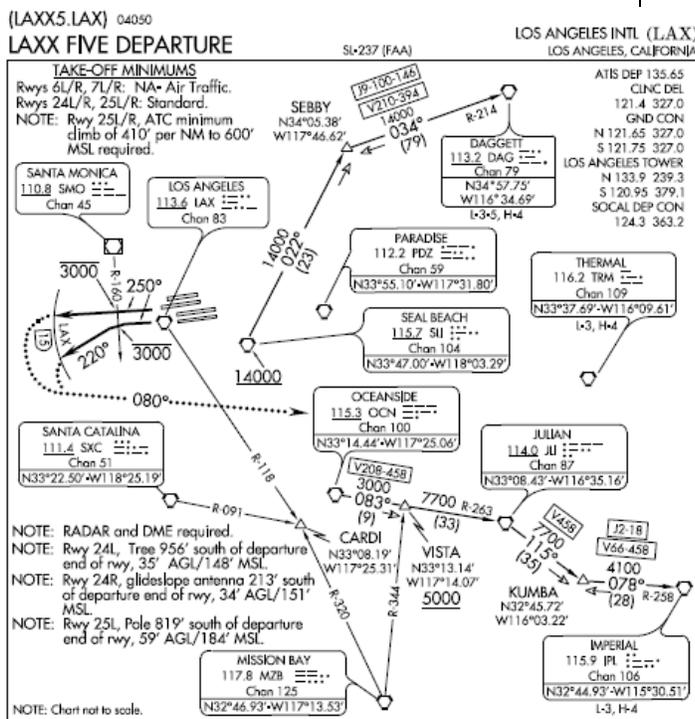
There's some good information here. In addition to your general routing information, you can also determine what altitude you're going to get from ATC when you file a clearance. *Turbojets maintain 10,000... Expect further clearance to filed altitude 10 minutes after departure.*

Any DVA pilot who's flown online out of Atlanta will recognize this as this is typically the clearance you'll get

before you receive your pushback and taxi clearances.

You can save yourself some time by immediately dialing 10,000 into your autopilot when departing Atlanta.

So we've looked at a simple SID. ATL5 is self-explanatory to large degree. But what about more complicated departures? I'm glad you asked. First let's look at Los Angeles International's LAXX5:



This SID applies to Aircraft taking off from KLAX to the west. Again, the written route description is on the same page as the visual depiction of the SID. Keep in mind that the visual depiction of the SID is not to scale, as it states on the charts. You can get an idea of distance by looking at the different legs of the SID. In the route description you see to which runways this SID applies:

**DEPARTURE ROUTE DESCRIPTION**

**TAKE-OFF RUNWAY 24L/R:** Climb via heading 250° to cross SMO R-160 at or below 3000, then via radar vectors to (transition) or (assigned) route. Thence....

**TAKE-OFF RUNWAY 25L/R:** Climb via heading 250° to cross SMO R-160 at or below 3000, then turn left heading 220° for vector to assigned route /fix/ transition. Thence....

....all aircraft expect further clearance to filed flight level three minutes after departure.

**LOST COMMUNICATIONS:** If not in contact with departure control by 1.5 DME west of LAX VORTAC, turn left heading 080°, climb to FL230 or filed altitude whichever is lower, and when able proceed direct filed or assigned route/fix/transition. Aircraft filing FL240 or above climb to filed altitude ten minutes after departure.

**DAGGETT TRANSITION (LAXX5.DAG):** From over SLL VORTAC via SLL R-022 and DAG R-214 to DAGGETT VORTAC.

**IMPERIAL TRANSITION (LAXX5.IPL):** From over OCN VORTAC via OCN R-083 and JLI R-263 to JLI VORTAC, then via JLI R-115 and IPL R-258 to IPL VORTAC.

As in the visual depiction, the route description tells us that this SID applies to aircraft departing KLAX from runways 24L/R and 25L/R.

Let's say our route takes us over the Daggett Transition.

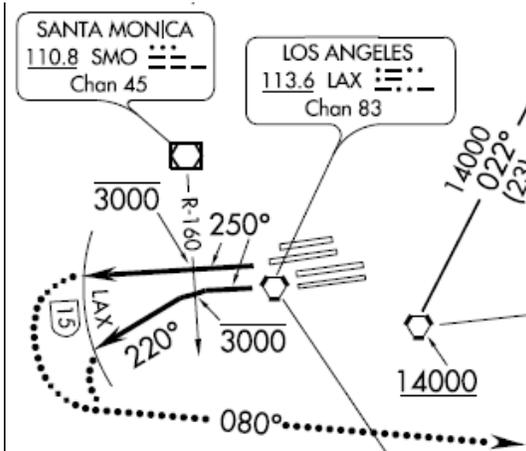
As the STAR in our KATL-KJFK route reads SIE.CAMRN4-KJFK, our flight plan leaving Los Angeles will read KLAX-LAXX5.DAG. Remember that SIDs and STARs are simply ways to funnel air traffic into and out of an airport's terminal area.

We've been giving a take off clearance from one Runway 25R. A look at the depiction of the SID shows that we'll take off and climb to, *but no higher than*, 3000 feet before passing the Santa Monica VOR. Here's where your VOR reveals another use besides

simple navigation. As you receive your taxi clearance, and are reviewing your SID, you'll note that you must be abeam of the SMO VOR before making a heading turn. Abeam is a nautical term that means directly beside. Think of it as 90 degrees of either side of your wing. How do you know when you're abeam the SMO VOR? Tune one of your navigation radios to the SMO frequency (110.8). When the needle is pointing to your right at 90 degrees,



you're abeam the SMO VOR. The other VOR should be tuned to the LAX VOR because you have to make a turn after 15nm from that VOR. Take another look at the chart:



There's a lot going on here, and that means a lot you've got to keep in mind as you depart along this SID.

Leaving the runway, you're to fly a heading of 250 degrees. When you see a line above an altitude as shown by the 3000 with the line above it, that means you're allowed to fly up to, *but not above*, that altitude. In this case, it's 3000ft. By the time we take off, the VOR receiver that we tuned to the LAX VOR will be tracking outbound. We fly at or below 3000ft on a heading of 250 degrees while watching the other VOR that we wisely tuned to the SMO VOR. The outbound radial from SMO is shown as R-160. Simply adding 180 degrees to 160 will give us a radial that, once the SMO-tuned VOR is pointing to, means we can make our turn. So now, our second VOR is pointing to a heading of 340; we are abeam the SMO VOR.

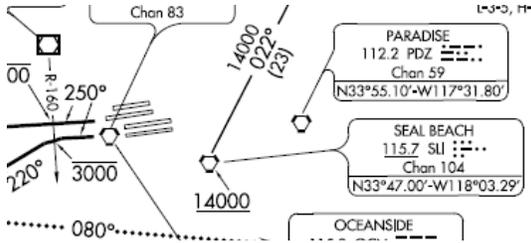
We now make a 30 degree climbing left turn to heading 220. Now that we've passed the 160/340 radial we can resume or continue climbing. The

3000ft restriction is lifted as we pass that point. Now what we're watching is the DME that's tuned to the LAX VOR. Once the DME readout shows 15nm from the LAX VOR, we'll continue our turn to heading 080.

Let's take a small aside here, and talk about navigation radio features. Typically, you'll have the ability to tune up to four VORs at any given time. You'll have two active and two on standby. This SID is a good example of why you would want to get into the habit of tuning frequencies you'll need in quick succession into your navigation radios as standby frequencies. In this example, you need to have SMO tuned into the active VOR, preferably your primary and LAX VOR as the secondary, or VOR 2. As the standby frequency in your VOR 1 radio, tune the SLI VOR (115.7). And for your NAV2 standby frequency tune the DAG VOR (113.2). Why? Take a look at the route description for the Daggett Transition: DAGGETT TRANSITION (LAXX5.DAG): *From over SLI VORTAC via SLI R-022 and DAG R-214 to DAGGETT VORTAC.*

If you're unfamiliar with SID navigation or even basic VOR navigation, you're probably asking how that helps clarify why you'd want SLI tuned to the NAV1 standby frequency. And I won't leave you hanging; here's your answer: as you're flying this SID you'll have enough going on that you don't need to give yourself any more to do than necessary. With the SLI frequency tuned as the standby frequency in your NAV1 radio, it's just a push of a button and you'll have the SLI VOR information available to you. Consider all that's going on at this point in your

flight. You're completing a 140 degree turn to the east, and you're climbing to at least 14000ft. You've got the SLI VOR approaching; there's no reason to be looking for the frequency or dialing it in. Do all that while you're taxiing out or setting up your flight. Another look at the chart:



Just as the line above the 3000 means *climb no higher than*, the line under the 14000 here at SLI VOR means cross *no lower than*.

ATC will give you vectors to the SLI VOR which you'll follow climbing at a rate high enough to ensure you cross SLI at or above 14000ft.

If you set up your NAV radios with the suggested set up from above, you now switch the NAV2 radio from LAX to DAG.

At or above 14000ft, you'll turn to a heading of 022 over the SLI VOR. You'll now be tracking outbound along the 022 radial from SLI. Your NAV2 will be tracking the DAG VOR. Approximately 23 nm along the R-022 radial from SLI, your NAV2 should be pointing to DAG at 034 degrees. Where these two radials intersect is the SEBBY intersection.

Don't be confused by the inbound/outbound concept of radials. The description states ... *via SLI R-022 and DAG R-214...* These are radials, and are written as outbound *away* from the VOR station. If you're flying *toward*

a VOR station, as in the case from SEBBY to DAG, simply subtract 180 degrees when flying East and add 180 degrees when flying West. On the SID, that's easy to do since it's the heading listed on the chart, 034 degrees.

Once you've followed the R-214 radial to the DAG VOR, you've completed the SID and will be on your way.

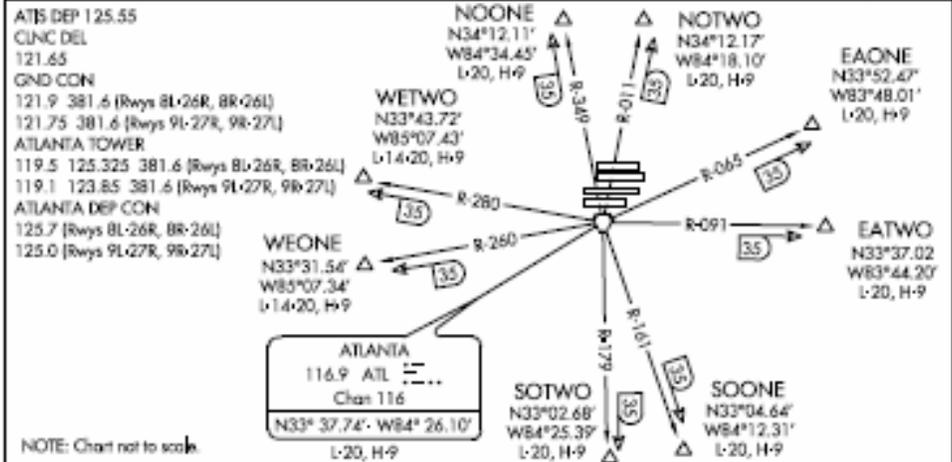
Remember, radials are outbound away from the station. It can be confusing at first, but it's really not a complicated concept. If you're flying *away* from the station along a radial, that radial and your heading will match. If you're flying *toward* the station, your heading and the radial will differ by 180 degrees. For help visualizing this concept, take a look at the chart: *from* SLI to SEBBY, the heading and the radial match, but *from* SEBBY *to* DAG, they differ by 180 degrees.

LAXX5 looks as complicated as ATL5 is simple. But using the resources available to you, the visual depiction and the written description, the confusion dissipates; and, with some practice, you'll be navigating SIDs like a pro. By the time we're done with this series, you'll be ripping through entire flight plans like a veteran. And VATSIM or IVAO ATC will appreciate your professionalism.

*If you've got flight planning questions, feel free to email the Delta Fly staff at [delta\\_fly\\_mag@hotmail.com](mailto:delta_fly_mag@hotmail.com) with the subject Flight Planning.*



05076 ATLANTA/HARTSFIELD • JACKSON ATLANTA INTL (ATL) ATLANTA FIVE DEPARTURE (ATLS.ATL) SL-26 (FAA) ATLANTA, GEORGIA



NOTE: Chart not to scale.

TAKE-OFF MINIMUMS: RWY 8L, BR, 9L, 9R, 26L, 26R, 27L, 27R, STANDARD.

NOTE: Monitor tower frequency when advised by ground control.

NOTE: Use departure frequency depicted unless otherwise assigned.

NOTE: NOISE ABATEMENT DEPARTURE TRACKS (NADTs): Following this procedure minimizes deviation from the idealized track. TURBOJETS ONLY: Anticipate the following NADT no wind heading: RWY 8R heading 070°, RWY 9L heading 090°, RWY 26L heading 275°, RWY 27R heading 250°. ATC will issue a wind corrected heading prior to takeoff. Fly assigned heading at the point instructed by ATC.

NOTE: TURBOJETS: Accelerate to 250 KIAS immediately until reaching 10,000 MSL, if unable, advise ATC.

TURBOPROPS: Operate in a manner that will result in best forward speed and climb rate.

DEPARTURE ROUTE DESCRIPTION

Turbojets maintain 10,000 (or requested altitude if lower), props maintain 4,000. Expect further clearance to filed altitude 10 minutes after departure. Maintain heading as assigned until vectored to appropriate VOR, airway, or jet route. Unless otherwise assigned, departure frequency for North runways (8L-26R and 8R-26L) - 125.7, South runways (9L-27R and 9R-27L) - 125.0. Transponder code will be issued via PDC or Atlanta Clearance Delivery.

SPECIAL INSTRUCTIONS: Midfield aircraft at ramps 1, 2, 3, 4, 5, and 6 will advise ramp towers of vector areas prior to pushback. The vector areas are associated with the depicted intersections as follows:

INTERSECTION	VECTOR AREA
EAONE	EAST-ONE
EATWO	EAST-TWO
NOONE	NORTH-ONE
NOTWO	NORTH-TWO
SOONE	SOUTH-ONE
SOTWO	SOUTH-TWO
WEONE	WEST-ONE
WETWO	WEST-TWO

Any aircraft receiving clearance via PDC may monitor Atlanta departure ATIS for departure runway. Upon receipt of ATC, clearance (from Atlanta Clearance Delivery), read back only your call sign and transponder code, unless you have a question.

SEA-1, 29 SEP 2005 to 27 OCT 2005

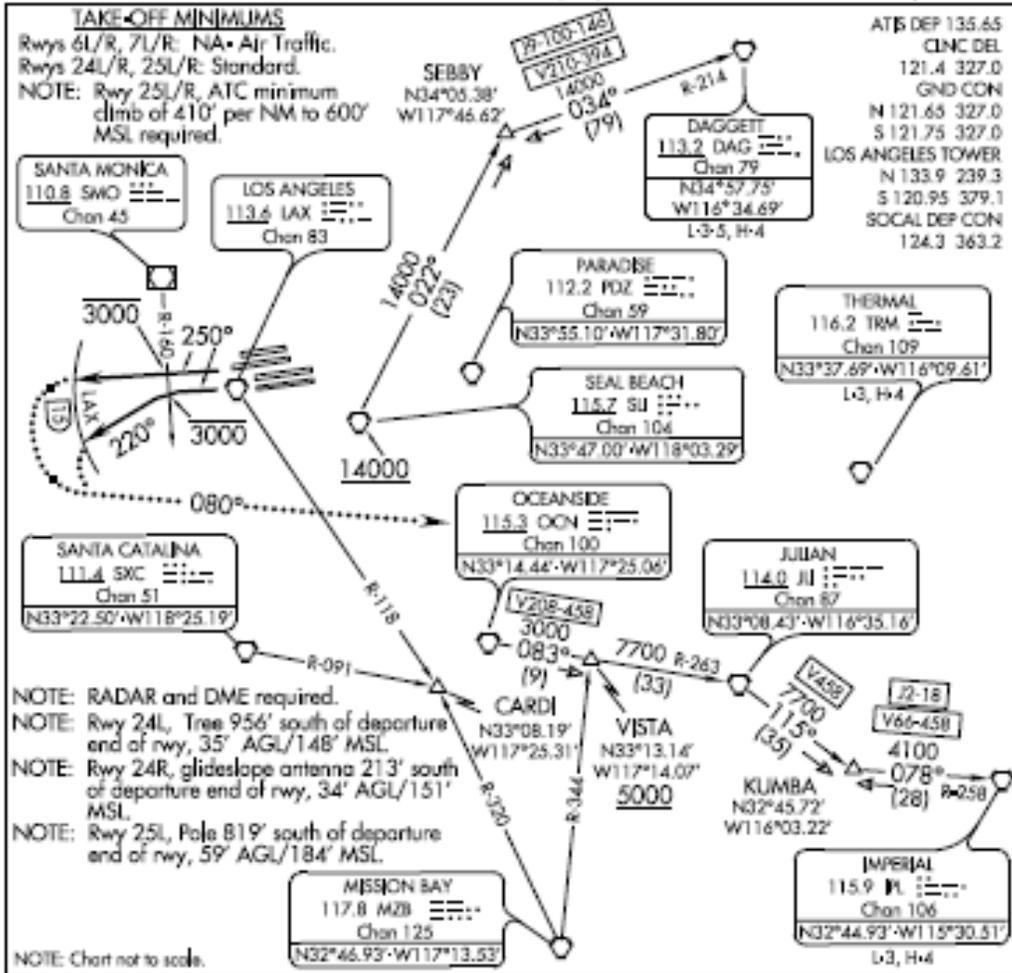
SEA-1, 28 SEP 2005 to 27 OCT 2005



(LAXX5.LAX) 04050

LAXX FIVE DEPARTURE

LOS ANGELES INTL (LAX)  
LOS ANGELES, CALIFORNIA



SM-3, 27 OCT 2005 to 24 NOV 2005

SM-3, 27 OCT 2005 to 24 NOV 2005

DEPARTURE ROUTE DESCRIPTION

**TAKE-OFF RUNWAY 24L/R:** Climb via heading 250° to cross SMO R-160 at or below 3000, then via radar vectors to (transition) or (assigned) route. Thence....

**TAKE-OFF RUNWAY 25L/R:** Climb via heading 250° to cross SMO R-160 at or below 3000, then turn left heading 220° for vector to assigned route /fix/ transition. Thence....

...all aircraft expect further clearance to filed flight level three minutes after departure.

**LOST COMMUNICATIONS:** If not in contact with departure control by 1.5 DME west of LAX VORTAC, turn left heading 080°, climb to FL230 or filed altitude whichever is lower, and when able proceed direct filed or assigned route/fix/transition. Aircraft filing FL240 or above climb to filed altitude ten minutes after departure.

**DAGGETT TRANSITION (LAXX5.DAG):** From over SLI VORTAC via SU R-022 and DAG R-214 to DAGGETT VORTAC.

**IMPERIAL TRANSITION (LAXX5.IPL):** From over OCN VORTAC via OCN R-083 and JLI R-263 to JLI VORTAC, then via JLI R-115 and IPL R-258 to IPL VORTAC.

LAXX FIVE DEPARTURE  
(LAXX5.LAX) 04050

LOS ANGELES, CALIFORNIA  
LOS ANGELES INTL (LAX)

**FROM THE AIM/FAR****Part 61 CERTIFICATION: PILOTS,  
FLIGHT INSTRUCTORS, AND  
GROUND INSTRUCTORS****Subpart B--Aircraft Ratings and Pilot  
Authorizations  
Sec. 61.65****Instrument rating requirements.**

(a) General. A person who applies for an instrument rating must:

- (1) Hold at least a current private pilot certificate with an airplane, helicopter, or powered-lift rating appropriate to the instrument rating sought;
- (2) Be able to read, speak, write, and understand the English language. If the applicant is unable to meet any of these requirements due to a medical condition, the Administrator may place such operating limitations on the applicant's pilot certificate as are necessary for the safe operation of the aircraft;
- (3) Receive and log ground training from an authorized instructor or accomplish a home-study course of training on the aeronautical knowledge areas of paragraph (b) of this section that apply to the instrument rating sought;
- (4) Receive a logbook or training record endorsement from an authorized instructor certifying that the person is prepared to take the required knowledge test;
- (5) Receive and log training on the areas of operation of paragraph (c) of this section from an authorized instructor in an aircraft, flight simulator, or flight training device that represents an airplane, helicopter, or powered-lift appropriate to the instrument rating

sought;

(6) Receive a logbook or training record endorsement from an authorized instructor certifying that the person is prepared to take the required practical test;

(7) Pass the required knowledge test on the aeronautical knowledge areas of paragraph (b) of this section; however, an applicant is not required to take another knowledge test when that person already holds an instrument rating; and  
(8) Pass the required practical test on the areas of operation in paragraph (c) of this section in--

(i) An airplane, helicopter, or powered-lift, appropriate to the rating sought; or  
(ii) A flight simulator or a flight training device appropriate to the rating sought and approved for the specific maneuver or procedure performed. If a flight training device is used for the practical test, the instrument approach procedures conducted in that flight training device are limited to one precision and one nonprecision approach, provided the flight training device is approved for the procedure performed.

(b) Aeronautical knowledge. A person who applies for an instrument rating must have received and logged ground training from an authorized instructor or accomplished a home-study course on the following aeronautical knowledge areas that apply to the instrument rating sought:

- (1) Federal Aviation Regulations of this chapter that apply to flight operations under IFR;
- (2) Appropriate information that applies to flight operations under IFR in the "Aeronautical Information Manual;"
- (3) Air traffic control system and procedures for instrument flight operations;

- (4) IFR navigation and approaches by use of navigation systems;
- (5) Use of IFR en route and instrument approach procedure charts;
- (6) Procurement and use of aviation weather reports and forecasts and the elements of forecasting weather trends based on that information and personal observation of weather conditions;
- (7) Safe and efficient operation of aircraft under instrument flight rules and conditions;
- (8) Recognition of critical weather situations and windshear avoidance;
- (9) Aeronautical decision making and judgment; and
- (10) Crew resource management, including crew communication and coordination.

(c) Flight proficiency. A person who applies for an instrument rating must receive and log training from an authorized instructor in an aircraft, or in a flight simulator or flight training device, in accordance with paragraph (e) of this section, that includes the following areas of operation:

- (1) Preflight preparation;
- (2) Preflight procedures;
- (3) Air traffic control clearances and procedures;
- (4) Flight by reference to instruments;
- (5) Navigation systems;
- (6) Instrument approach procedures;
- (7) Emergency operations; and
- (8) Postflight procedures.

(d) Aeronautical experience. A person who applies for an instrument rating must have logged the following:

- (1) At least 50 hours of cross-country flight time as pilot in command, of which at least 10 hours must be in airplanes for an instrument -- airplane rating; and
- (2) A total of 40 hours of actual or

simulated instrument time on the areas of operation of this section, to include--

- (i) At least 15 hours of instrument flight training from an authorized instructor in the aircraft category for which the instrument rating is sought;
- (ii) At least 3 hours of instrument training that is appropriate to the instrument rating sought from an authorized instructor in preparation for the practical test within the 60 days preceding the date of the test;
- (iii) For an instrument -- airplane rating, instrument training on cross-country flight procedures specific to airplanes that includes at least one cross-country flight in an airplane that is performed under IFR, and consists of--
  - (A) A distance of at least 250 nautical miles along airways or ATC-directed routing;
  - (B) An instrument approach at each airport; and
  - (C) Three different kinds of approaches with the use of navigation systems;
- (iv) For an instrument -- helicopter rating, instrument training specific to helicopters on cross-country flight procedures that includes at least one cross-country flight in a helicopter that is performed under IFR, and consists of--
  - (A) A distance of at least 100 nautical miles along airways or ATC-directed routing;
  - (B) An instrument approach at each airport; and
  - (C) Three different kinds of approaches with the use of navigation systems; and
- (v) For an instrument--powered-lift rating, instrument training specific to a powered-lift on cross-country flight procedures that includes at least one cross-country flight in a powered-lift that is performed under IFR and consists of--



(A) A distance of at least 250 nautical miles along airways or ATC-directed routing;

(B) An instrument approach at each airport; and

(C) Three different kinds of approaches with the use of navigation systems.

(e) Use of flight simulators or flight training devices. If the instrument training was provided by an authorized instructor in a flight simulator or flight training device--

(1) A maximum of 30 hours may be performed in that flight simulator or flight training device if the training was accomplished in accordance with part 142 of this chapter; or

(2) A maximum of 20 hours may be performed in that flight simulator or flight training device if the training was not accomplished in accordance with part 142 of this chapter.

[Amdt. 61-102, 62 FR 16298, Apr. 4, 1997; Amdt. 61-103, 62 FR 40900, July 30, 1997]

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