No plans

I like planning things. I'm reasonably good at it. I stay on top of what needs to be done, make lists to make sure I don't miss anything, keep from leaving loose ends, and try to cover all the bases. It's comforting to me to have lists. It gives me some structure; when things need to be done, they will be done, because they have been crossed off the list.

What happens when I have no control over events which will have a huge impact on my life?

We are waiting for the possibility of a baby. We have done everything we can from our end. At this point, we're just waiting. If we get to the end of December without a match, we will reassess. Some part of me would love to make a room for the baby, set up books and toys and clothes, and start making sure we have a place that works when a baby comes home with us. Unfortunately, it isn't a "when". It's an "if". I know that, for my peace of mind, I can't set up a nursery right now. It would be built on hope, not reality, and if it didn't end up working in the end it would be very difficult to have to take everything down. I know this may not work, so not setting up a room is a protection of sorts. It keeps me from getting too emotionally invested when we haven't even been matched with a biological family.

I can't plan for this. I can't make it work. I can't fix anything or make it more likely. I am in limbo.

There's another piece of this, too. We're planning to move out of this town eventually, but the timeframe might be pushed up. It has nothing to do with me or my decisions. I support the idea, and I'm happy with it, but at the same time it is, again, something I can't control, despite it being a life-altering change.

I, the one who likes making sure everything is lined up, can't

plan for anything over the next few years with any certainty at all.

I can adapt when plans change. That’s life, and I have become accustomed to dealing with change. I’m not always graceful about it, but generally I handle plan changes cheerfully and just shift as needed.

I’ve never really been without plans altogether.

Right now, I do not feel like I can reliably plan anything more than about a month away. Maybe a biological family will show up and be due almost immediately. I don’t know. I can’t predict that. I can budget. I can make sure that everything at home and at work runs as smoothly as possible. I have my own limited little area that is not completely without form or focus. If I look further than a month out, though, I end up lost and afraid to plan much of anything because the maybes are much too big.

I am learning to sit back and let the world go by. I am trying to accept the fact that I have no control. I am learning to run (not fast, but at least I’m doing it) and that is helping, because I am simply putting one foot in front of the other. I do not have to plan anything but my route, and that is simple. Once that is done, I just take one more step until I turn around, then one more step until I get home. The most important thing in flying is the next thing. I suppose I am learning to apply that to the rest of my life, though it is rather difficult for me.

Perhaps I will eventually learn to be happy with not planning too many things. I rather doubt it, as I have liked planning much of my life, but I don’t know. For the moment, I am working on accepting the present, enjoying life, getting enough sleep, making sure the animals are happy, eating good food, making sure we stay on budget, and not really worrying about the rest of it. Sometimes that’s all I can do.

Spirit

The Indie Ink challenge has gotten more interesting. Now we're getting other people involved, and I got a challenge I wouldn't have picked for myself this week. It's a stretch. Supermaren came up with mine: Write a story involving a famous historical event from the perspective of an inanimate object.

Let's see how this goes…

He watched me being built and made sure they did it right. He knows me better than anyone. That ended up being very important. It was stormy for days so we couldn't leave. He's been pacing, getting irritable. Today, though, the rain has stopped. He showed up early this morning, jubilant, carrying sandwiches and water. He checked me over very carefully, topped off all five tanks, and we were off. There was a huge crowd cheering us on, although I think they all held their breaths for a minute as we got off the ground. It was a little squishy from all of the rain, and I was heavy, but we got up and moving eventually. Not hitting the telephone wires or the tractor helped. I knew we could get up, but he seemed a little nervous at first. I don't like taking off from squishy surfaces. I really wanted a hard, fast runway, one that let me get up to speed easily, but once we were up it didn't matter.

We flew for a while, getting comfortable, and then he turned me out over the water. It was dark and foggy. The moon wasn't out, and it was hard to see the stars. I'd never flown in weather like this. I knew that below me was only water, but I couldn't see anything. It was cold, too. We flew through part of a cloud and I could feel ice building up all over me. I didn't want to keep going into the cloud because I didn't know if I could keep flying. Ice is heavy stuff, and I was already

heavily laden. Luckily, he turned away from the cloud and the ice began to dissipate. We went down to help get rid of the ice. We were still over water, and he was flying us too close. I thought it was too close, anyway. Anything less than a wingspan if we're not landing makes me very nervous, but it was the only way he could keep us out of the clouds.

All of a sudden, he turned towards lights. Boats! He circled for a while. I'm not sure why, but I didn't need to – at least he pulled me up a little higher. I don't know how to explain how it feels to be too close to the water. I knew if he made even the smallest mistake I would smash to bits trying to land, to keep him safe. Water is not forgiving, you know, at least not when you meet it at speed.

The sun began to rise, and the fog cleared. We were over land again, finally. If something went wrong here, I knew he could get us down. We'd practiced enough to make sure he could land me safely under almost any conditions. I felt much safer and happier. The winds were with us, a little bit of a tailwind speeding us along, and I could feel contentment drift in as I did what I was designed for. I carried him smoothly. He didn't have to work hard to keep me straight and level; he'd build me well, so even with the fuel tanks I wasn't too hard to fly. We flew for a very long time. It wasn't exciting, but the scenery was beautiful, and it was a very nice day.

As night fell again, we saw the lights of a big city beginning to show in the distance. He aimed us towards the lights. We circled the Eiffel Tower, a beautiful sight, and got to see all of Paris laid out beneath us. He aimed us towards an airstrip and circled into the wind, then landed. I thought the crowd as we left was huge, but this was more people than I've ever seen. We'd been flying almost 34 hours straight. I still had fuel in my tanks. As we landed, he had to stop my propellor to keep from harming anyone. People were swarming the airfield, trying to get close enough to touch him, screaming and cheering.

I knew that most of the glory was his, but I had provided the vehicle for his victory. I am happy with that, and it was the flight of a lifetime.

METARs

KRNO 241155Z 30003KT 10SM SCT200 04/M06 A3012 RMK AO2

Pilots just beginning to learn to fly get to see that for a weather report. I responded with "…what?" and my instructor laughed at me.

This is a METAR, an hourly meteorological observation report. If you aren't a pilot or don't want to become one, you will probably never see one of these. If you are a pilot, aspiring or active, these are very important. You should check the METAR before every flight, especially if you live someplace with, shall we say, variable weather.

There are a few tricks. The first is that the first three things on the report are all Ws – Where, When, and Wind.

Where, in this case, is **KRNO**. That's the RNO airport, or Reno, in the United States (thus the K at the beginning, which signals the US – each country has its own indicator).

When always has the date first (just the day, though, not the month or year, as the assumption seems to be that you ought to know at least that part of the date) and then the time, hours and minutes, in Zulu, which is aviation and military for Greenwich Mean Time. It's good to know where you are in relationship to Zulu time so you can tell how recently the METAR report was recorded. You should also be careful, as the relationship with Zulu time changes with Daylight Saving Time.

For Pacific Time, Pacific Standard Time is Zulu -8 and Pacific Daylight Time is Zulu -7.

Wind has a few things you might see. In this report, it is **30003KT**. The first three numbers, 300 in this case, are the direction of the wind. This could be VRB, which stands for variable, if the wind direction is not consistent. 03KT means the wind is at 3 knots, which is not very much wind. You may also see something like this: 36007G15KT, which would be wind coming from 360 degrees (straight north, for those of you who don't know the compass headings by heart), with the wind speed at 7 knots gusting (that's the G) to 15 knots. If the winds are above 6 knots and it's a day with interesting winds, you might see this: 16018KT 140V250, which indicates that the winds are from 160 degrees at 18 knots, but the direction is actually variable between 140 degrees and 250 degrees. For this to show up, the wind has to have a difference of more than 60 degrees in the variation.

10SM means the visibility is ten statute miles. This is generally the highest number you will see. It can go down to 1/4 of a mile visibility.

SCT200 means there are scattered clouds at 20,000 feet. Always add two zeros to get the altitude of the clouds.

04/M06 is the temperature and dewpoint. The dewpoint is the temperature to which the air must be cooled for condensation to form. These temperatures are in Celsius, and the M means minus.

A3012 means the altimeter shows 30.12 inches of mercury for the pressure.

RMK AO2 means that this is the beginning of the remarks section and that the station is automated and has a precipitation sensor. If it's AO1, it does not have a precipitation sensor.

Now for the fun part. What if something more dramatic is going on? Here are some of the pieces you may see:

Clouds:
Couds are measured in eighths of the sky, or octas.
SKC Sky Clear
FEW 1-2 octas
SCT 3-4 octas
BKN 5-7 octas
OVC 8 octas – this is short for overcast.

– means light.
There is no notation for moderate.
+ means heavy.
C is in the vicinity.

Here are some descriptions:
MI Shallow
PR Partial
BC Patches
DR Low Drifting
BL Blowing
SH Shower(s)
TS Thunderstorm
FZ Freezing

Precipitation is listed like this:
DZ Drizzle
RA Rain
SN Snow
SG Snow Grains
IC Ice Crystals
PL Ice Pellets
GR Hail
GS Small Hail and/or Snow Pellets
UP Unknown Precipitation (I always wondered what could be falling out of the sky to get this notation!)

If the air is not clear, you may see these:
BR Mist
FG Fog
FU Smoke
VA Volcanic Ash
DU Widespread Dust
SA Sand
HZ Haze
PY Spray

This is where it gets fun (or I go find a closet to hide in, which works, too):
PO Well-Developed Dust/Sand Whirls
SQ Squalls
FC Funnel Cloud Tornado Waterspout
SS Sandstorm

If you see any of the last four, I sincerely hope you decide not to fly.

I'm a VFR pilot. I don't fly in clouds or nasty weather, which is just fine with me. I may eventually get my IFR (instrument) rating, but that will mostly be because I like learning new things, not because I like storms.

Now you have some idea how to read a basic aviation weather report, and I've remembered a few things I had forgotten. I think that's positive all around. At some point I'll get into SIGMETs and AIRMETs, but that's a post for another day.

Four forces and control

surfaces

There are four forces that act on an airplane in flight: life, thrust, drag, and weight/gravity.

I've gone over lift, so today I'll run through the other three and then talk about control surfaces.

Drag is what slows the airplane down. Drag is caused by the airframe hitting the air (wind resistance), by cooling ducts, by things sticking out from the airframe (antennas, for instance), and drag that's caused by lift (when you are flying with an angle of attack that is not 0, some of the lift force generated goes to the rear, causing drag).

Thrust either pushes or pulls an aircraft through the air. This is done through propellers or jets. Thrust overcomes drag on airplanes. If you are playing with a paper airplane, you throwing it is the thrust.

Weight, or gravity, pulls the airplane down. This is made up of the airplane and whatever you've put in or on it.

Silly joke – an Alaskan bush pilot took a tourist on a hunting trip. They bagged a moose and strapped it onto the plane. They took off and the plane struggled and strained and finally ran into a mountain, about 3/4 of the way up. The pilot and passenger landed safely, amazingly enough, and the passenger was not pleased. He became even less pleased when he noticed that the pilot was laughing. "What are you laughing about? We're stuck in the middle of nowhere and your plane is on top of my moose!" The pilot replied, "No! this is great! Last time I only got halfway up!"

Just a little too much weight.

During take off, thrust must be greater than drag and lift must be greater than weight. If those requirements are not

met, the airplane doesn’t take off.

Control surfaces are fun. They’re especially fun once you get into training that deals with how to handle control surface failures and you learn that opening a door can help you control a plane in flight, but that’s probably another post.

There are three directions an airplane can move.

When you are looking at the front of the airplane, roll makes the wings go up and down but the nose stays pointed directly at you. Ailerons control roll, and the stick or yoke controls the ailerons. Ailerons are located on the trailing edge of the wing and are hinged so they go up and down in opposition – when one is up, the other is down.

When you are looking at an airplane from the side, pitch moves the nose up and down. The elevator, located on the trailing edge of the tail. Pushing the yoke or stick forward moves the elevator down and pushes the nose down as well.

When you are looking at an airplane from the top, yaw moves the nose and tail from side to side. The pivot point is basically the cockpit, and the nose and tail circle around that on the horizontal axis. Yaw is controlled by the rudder pedals. If you are making a turn in an airplane, you have to control yaw or the tail slides out. If you have passengers, they are more likely to turn green from yaw than from pretty much anything else. It feels weird, like your rear end is trying to escape from your spine and move off to the side. That’s an overstatement, of course, but it’s the reason “flying by the seat of your pants” starts to make sense when you are in the pilot’s seat. You can feel yaw.

The flaps are the final control surface. I discussed them some in the section on lift. They are most commonly used for takeoff and landing.

That about does it for the very basic parts of control

surfaces. I think perhaps I'll get into weather next time.

How do airplanes fly?

I have a fun one today, which includes an experiment so you can understand a little better.

Take a smallish piece of normal copy paper, not much bigger than 3″x5″. Hold the short end under your lower lip, so you can blow over it but no air will go under it. Blow.

Didn't expect the paper to move, did you?

Another experiment – hold two pieces of paper up to your face, on either side of your mouth, about 3″ apart. Blow between the pieces of paper. My first thought was that they would push apart, but they don't. They come together.

How is lift generated? How do airplanes fly? Intuitively, at least for me, they shouldn't. Airplanes are getting pushed forward, not up. This gave me a headache for a while, but then I started to understand a little more. I didn't have to do the actual physics equations, either, so those of you who have issues with physics don't have to worry about hard math.

The problem we face when trying to figure this out is that there are two separate camps, both of which have part of the answer. The actual answer is very complex, so we'll go through it as simply as possible.

Bernoulli's equation says that air going over a surface that is curved on top and flat on the bottom will have less pressure on the top because the air is going faster there. The lower pressure provides lift. Things will move towards an area of lower pressure. This kind of lift is dependent on the shape

of the wing. Gliders are almost completely dependent on this kind of lift. No engines to push them forward and create relative wind. This kind of lift is also very stable.

Newtonian lift is created when air hits the bottom of a tilted surface (remember the angle of incidence?). The air is deflected downward, which creates the equal and opposite reaction of upward lift on the wing. If you have ever stuck your hand out the window of a moving car and tilted your hand, you have felt the air push your hand up as you deflect it down. This kind of lift doesn't depend on the shape of the wing. It's somewhat unstable, which, again, you can find out by sticking your hand out the car window – you'll feel the adjustments you have to make to keep your hand from going in unexpected directions.

Between these two kinds of lift, you have pretty stable flight.

People have huge arguments over which one of these equations is correct. They both are, in combination. Before powered flight, humans used Bernoulli's lift pretty much on its own. With powered flight, we can use Newtonian lift to get more lift and Bernoulli to stabilize the flight.

See? No physics equations, and a couple of neat things to try. Not as hard as you thought, was it?

Flying – defining terms

Today I'm going to define some very basic terms for flying. As I work through the Private Pilot test preparation, I'll be using the terms at times, and if you understand what I'm talking about it will be easier to follow. It also gives me a

good review of what I used to remember easily.

First, the airfoil. An airfoil is a structure or body which produces a useful reaction to air movement. This includes airplane wings, rudders, propellers, and helicopter rotor blades. Today we'll talk about wings on fixed-wing aircraft.

Here is the cross section of a wing:

"A" is the leading edge. That's the front of the wing. "B" is the trailing edge. The dotted line going through the wing is an imaginary straight line from the leading edge to the trailing edge called the chord line. The chord line does not necessarily go through the wing, depending on the wing's shape.

If you lower the flaps, the chord line will drop and go from the leading edge to the bottom of the flap.

Before we go any further, I'd like you to wrap your brain around a concept. When we're talking about the movement of air around an object, the air acts like a fluid. The next term I want to introduce is relative wind. This is the wind felt by an airfoil, but it can be produced by either the airfoil moving or the air moving past the airfoil. Possibly the easiest way to explain that idea is by poking a stick into a stream bed. The water is moving past the stick. That is the relative wind. Even though the stick is not moving, there is a relative wind. Relative wind is parallel and in the opposite direction of the path of the airfoil, so if the wing is pointing up at an angle, the relative wind is going down. Straight and level flight produces wind coming from the front of the airfoil going straight back. If your flight path goes down, the relative wind is upwards.

This explanation is important because it defines one of the

very basic terms that will be used when we're talking about climbing and stalling. The angle of attack is the angle between the chord line of the wing and the relative wind. You can change your angle of attack by changing the control surfaces of the airplane.

The angle of incidence is the angle at which the wing is attached to the rest of the airplane. This doesn't change.

That's it for now for the test prep. Next time I write about flying we'll go through lift and a few explanations of how airplanes fly.

Circuit breakers

One of the scariest things I've done while flying was take off with my flaps fully down. It wasn't on purpose, and it could have caused a crash.

I learned to fly partly in a Cessna 172 that was about 30 years old. It had resettable circuit breakers for several things, including the flaps. In general, this was not an issue. These were checked every time I did a preflight and they were easy enough to push back in.

I was doing touch and gos after I had been soloing for a few weeks, which meant that I took off, went through the pattern, landed, and, instead of stopping, took off again. My instructor thought it was very important for me to learn to land with full flaps (having already flown some aerobatic planes, I was much happier not using the flaps) so I was doing as he asked – every round, I'd lower the flaps all the way (which slows down the plane considerably), land, then raise the flaps, do a quick run through to make sure the plane was

in good shape, and take off again.

I had done several touch and gos already that day, and I was feeling pretty comfortable. I landed nicely, retracted the flaps, started getting back up to speed as I ran through my checklist, came off the ground into ground effect at the correct speed, and then realized that something was not right. The controls felt sluggish, and my airspeed was not increasing.

I looked out the window. The flaps were still down.

I looked at the controls, and I had raised the flaps.

I looked at the circuit breakers, and the flaps breaker had popped. I thought the flaps had gone up, but the breaker popped, so they never actually came up.

Flaps can increase lift, but only in the first increment. After that, they increase drag. This can be a significant increase in drag. I was in ground effect, which is the distance from the ground that is less than or equal to the length of the wing of the plane, and in ground effect, you get extra lift. You kind of have a cushion of air. For the moment, I was reasonably safe, but the end of the runway was coming up fast, I didn’t have enough space to land, and I couldn’t retract the flaps that close to the ground because I would lose lift rather suddenly and likely hit the ground hard. There were also trees at the end of the runway.

I was talking to tower throughout this, at least a little bit. They knew I was a student pilot and they could see the flaps. They asked if they could help, and I said I didn’t think so but could I possibly not talk to them for a few minutes, and they said ok and let me be. That left me with enough attention to do something about the problem.

I started going up, carefully. I couldn’t raise the nose much because, when you climb, you lose airspeed. With the flaps

down, this close to the ground, I couldn't afford to lose any airspeed because I would probably stall (flaps full down decrease stall speed, too), and stalling would probably make me crash. I cleared the trees without a lot of room to spare and very, very carefully made the turn to the next leg of the pattern. Once I had gained enough altitude, I set the flaps so they would not all retract at once and reset the circuit breaker. I then retracted the flaps slowly as I continued flying up to the pattern elevation.

I really wanted to stop flying right then, but I knew if I did I might not get back into a plane, so I did one more touch and go. The tower people were very nice (and probably very relieved that there weren't any messes to clean up!). I did my last touch and go with no issue, landed, taxied off the runway, got the plane near the hangar, shut her down, got out, and shook for a few minutes.

I don't assume that instruments are telling me exactly the right information anymore. I pay attention to circuit breakers and to feeling like something is off. I was lucky this went as well as it did and I had the opportunity to learn from it.

Cessnas are great planes to learn in, but keep an eye on your circuit breakers.

Ice, ice, baby

I was talking to a person on a bus while I was in Washington DC recently. He was from Florida, and he was talking about the storms they've been having this winter. He said he completely understood why airplanes couldn't fly with ice on their wings and tails; it's because the ice is so heavy that it pulls the plane down.

He was rather surprised to learn that he was wrong.

The weight of the ice can be a problem, especially if you are talking about ice picked up in flight. The main problem, though, and the reason a visual check of the wing may not be enough to keep you out of trouble for your preflight check, is that ice on the wings spoils the airflow. Even bits of ice as small as grains of salt can decrease lift and increase drag. If you've planned a flight based on the normal flight capabilities, ice on the wings can cause you to run out of fuel, for instance, or stall at a speed and attitude that is usually safe. Another issue, if you are talking about bigger pieces of ice, is that a piece of ice can come off the wing and hit some other part of the airplane.

The lift generated by the wing is dependent on the shape of the wing. Even tiny changes in the shape can change the airflow. If the air coming off separates from the wing too soon, you don't get the lift you need. Ice can also form on propellers, limiting the efficiency and increasing the work required from the engine. Some planes have boots on the leading edge of the wings that can be inflated so the ice breaks off. There are also several other options, including bleeding heat off of jets to keep the wings warm enough so they don't ice up (which I think is really neat).

Checking for ice before you fly is a good start. There is another problem, though, that you need to keep in mind. Moisture in the air can be supercooled. This means that the water can actually be below freezing, but because there is nothing for the water to freeze around, it stays in a liquid state. If you introduce something new, such as the wing of an airplane, the water immediately crystallizes into ice. A pilot flies into a cloud with no ice on the wings and suddenly has a noticeable accumulation of ice. Not a good thing. If you fly VFR (visual flight rules – no cloud flying!) this part of wing icing shouldn't be an issue, but if you are flying IFR (instrument flight rules) and it's cold outside, this can

cause you pretty serious issues. You can still get wing ice if it’s cold and you aren’t flying through clouds, but it isn’t quite as dramatic.

Wing icing is not something you want to take chances on. If it’s cold out, run your hand over the flight surfaces when you are doing your preflight. You’ll feel ice if it’s there, and you’d rather find out before you take off than realize there’s an issue when you can’t make the turn out of the pattern.

Suck. Squeeze. Bang. Blow.

However the title may sound, it’s not X-rated. Not even R-rated.

The last blog I wrote, I got tired of hearing myself ramble sometimes. Feelings are all well and good, and I had a lot to work through, but I ran out of things to say. I don’t want to do that this time, and I do want to start moving towards flying again, so I am going to start working my way through the various tests that people have to pass to get a pilot’s license. My license is not current, but I’m hoping to remedy that soon. I can’t take you up in a plane with me, but I can talk a lot about flying, especially about the knowledge required. This is the first of those posts. If you don’t care or aren’t interested for whatever reason, skip the posts under the “Flying” category. Otherwise, I hope you enjoy the ride!

Suck. Squeeze. Bang. Blow.

Those are the cycles of a four stroke engine. The first time I said that to my flight instructor, he just about spit his coffee across the room. I had been having a hard time remembering them, but I came across this somewhere and loved

it, both for its suggestive qualities and because it was easy to remember.

Suck. Intake. The piston is near the top of its cycle. As it goes down, the exhaust valve closes and the intake valve opens. The vacuum (suck!) created by the piston moving down pulls in the fuel and air mixture. We'll talk about leaning and enriching the mixture later, and what effect altitude has on that.

Squeeze. This is the compression part of the cycle. As the piston comes back up, it compresses the air and fuel mixture. This raises the temperature and increases the pressure of the air/fuel mixture.

Bang. Ignition, blastoff, whatever floats your boat. Or flies your plane. Whatever. The mixture we just compressed is ignited by the spark plug, increasing the pressure and shoving the piston back down again. This is where the power comes from, what makes the engine go.

Blow. Remember the exhaust valve that closed during the sucking part? It's opening again, and the pressure forces the gasses out. The piston is pushed back up again, the exhaust valve closes, and the cycle starts again.

This is really basic. This is why, if your spark plugs are fouled, your car doesn't work, or it doesn't run smoothly – without the "bang" part, the piston doesn't get shoved down and the cycle doesn't work. This is the beginning of understanding a four stroke engine, and the beginning of my lessons for you, and for refreshing my memory, about how airplanes work and how to fly.

Welcome to my brain. Prepare to learn a bit of physics, weather, and what all of the random dials in front of the pilot do. Oh, and just to be clear, I don't fly jets. You can make a brick fly if you put jets on it. The planes I fly are maneuverable, exciting, and responsive, and they are quite

enough for me. Not that I'd object to a ride in a jet, but it's not my cup of tea. Right now, anyway.

This is just the beginning. There's a lot of information to get through, and if I have a hard time understanding something, you'll hear more about it.