Simulated Instrument Training

Instrument Flying Handbook

SIMULATED INSTRUMENT TRAINING: When transitioning to simulated instrument conditions you want to remember that everything is the same as it was when you were flying outside the plane. Now that you are using the attitude indicator instead of the natural horizon, remember to keep it simple. All you need to do is transfer the three attitudes of flight to the attitude indicator and you will be fine. The power settings of flight will also apply also. Remember, you will have to find them for the specific airplane you are using. However the numbers I gave you in chapter 2 should be pretty close.

You will notice that I have the simulated instrument flight in two lessons that are completely separate from everything else. Some schools will do this before solo training and will scatter this throughout the training. I personally believe that this is an area that should be separate. Therefore I have two flights that are just on this subject. This way the first flight you can get used to instrument flight it for a little more than an hour and the second flight you can practice it and get a better feel for it.

Four Fundamentals Under The Hood

FOUR FUNDAMENTALS UNDER THE HOOD: Now you will learn to fly the aircraft with the instruments and nothing else. At first you may get disoriented and feel like a goof, remember to trust the instruments. No matter what your body is telling you, this is the most important thing you want to remember. You will want to focus on two things on these flights with your instructor. The first thing you should go over is basic attitude instrument flying, known as BAI.

The second thing you will do is go over basic navigation with the VOR. In many cases I will also show students a practice ILS (Instrument Landing System) if possible. The ILS is not required but I feel that you should have some knowledge of this in case you ever get into a bad situation. (I know you will not). You can always ask your instructor to take you up and show you an ILS. In the event you get into bad weather (yes it can happen) you will have a better chance of getting on the ground safely.

If you remember from the dangerous situation awareness course, you can get spatial disorientation which is especially true when you are flying instruments. When you are under the hood, you can always peek. If you inadvertently fly into the clouds, you cannot do that. You only have one choice and that is to trust the instruments. It will be tough at first but you have to get it set in your mind that you are going to trust your instruments and not what your body is telling you

.

BAI: BAI is known as Basic Attitude Instrument Flying. Now we will go over the four fundamentals of flight. The difference this time is the fact that you will not be able to see outside the aircraft. Don't peak! Your brain will want to peak but it is not in your best interest to do so. You will have this time with your instructor, therefore get the most out of it. The same things apply to instrument flight that applies to VFR flight.

Back in chapter 2 I explained my simple attitude system using the three attitudes of flight and the power settings of flight. All you have to do is transition them into the cockpit now. The same things will apply to instrument flight. The only difference is the horizon you will be using is the attitude indicator instead of the horizon. This instrument is much smaller than the actual horizon but it will tell the pilot the same information.

You will have to find out for yourself where these attitudes are, but I will give you a little guideline that will be pretty close. Go out to your airplane and take a look at the attitude indicator and look for two things: the first is the fake airplane wings. The second is the horizon line. You will notice the width of the two lines are about the same. It will depend on the manufacturer but they should be pretty close. They are probably both about 1/8th of an inch thick. These are the two things you are going to use for your attitude flying. I have listed below how to make it simple:

CLIMB ATTITUDE: This will be when the bottom of the airplane wings are on the top of the horizon line;

DESCENT ATTITUDE: This will be when the top of the airplane wings are on the bottom of the horizon line;

LEVEL ATTITUDE: This will be when the wings are right on top of the horizon line;

POWER SETTINGS OF FLIGHT: Now these will remain the same but now under the hood you will want to focus on the sound of the engine.
One thing about instrument flight conditions is that if you move your head quickly, chances are you are going to get disoriented, so you want to look straight ahead at the instrument panel. You don't want to jerk your head around. Listening to the engine will help keep you from becoming disoriented.
By now you should have the hang of what the power settings sound like.

I will walk you thru this, starting out by taking off. When you take off, your instructor should immediately put you under the hood. You will be climbing first so the attitude indicator may be off a little bit. You will want to get the climb established first. Once you are under the hood, you want to see where the small aircraft on the attitude indicator is. Make sure the aircraft is trimmed for your climb attitude. Once you are all set up, check the airspeed indicator. The aircraft should be climbing at the normal speed. but in most cases it should be about 80-85 KIAS. It will depend on the airplane you are using.

Straight and level, turns, and descents are the same. Use the attitude indicator as your horizon and then use the other instruments as backups, the same as normal VFR flight. When you want to level off pull the power off to cruise power setting and push the nose forward until the miniature aircraft on the horizon. In Most cases you will have to trim the aircraft for cruise flight since you will be gaining airspeed. Do the level off checklist and then check the other instruments to make sure that the aircraft is doing what you want. If the VSI and altimeter are showing a climb or descent, you will have to adjust the attitude indicator accordingly. Once the attitude indicator is set, all of the maneuvers are performed the same, using the attitude indicator instead of the horizon. Once you have the aircraft established with the attitude indicator, cross check the other instruments to verify the results you are looking for. But your main focus should be the attitude indicator.

ABOUT THE VSI: You don't want to chase the VSI. You want to remember that the VSI is 3-5 seconds behind the airplane. If you chase this instrument you will be all over the place. I would only use this instrument as a back up. Use the attitude indicator.

TURNS: When we perform turns, the middle ear will have a tendency to tell our brain the wrong thing. One way we try to minimize this during instrument flight is something known as the standard rate turn. If you look at the turn coordinator, there are two marks on each wing of the small aircraft. When the miniature aircraft is lined up with one of these marks, the aircraft is at what is known as the standard rate turn. You want to make sure that you do not over bank or you will be disoriented. The standard rate turn will be somewhere around 15 degrees therefore establish the bank and then look at the turn coordinator to make sure you are not exceeding the desired bank.
For you private pilots, I have my students follow a simple rule: **NEVER BANK MORE THAN 10 DEGREES**

DESCENTS: The descent is simple. As you normally do when we are looking at the horizon, bring the power back until the nose is at the desired position. Once the aircraft is established, look at the RPM gauge and adjust accordingly.

HIGH ALTITUDE MANEUVERS: The high altitude maneuvers are not that hard once you get used to trusting the instruments. Instead of the horizon for a reference, again you will use the attitude indicator. All of the procedures will be the same except you will not be able to look at the wing to see if you have the aircraft coordinated.

SIMPLE WAY TO TELL IF YOU ARE COORDINATED UNDER THE HOOD: You can use this when you are trying to maintain a heading. Remember before you used the wing of the plane to tell if you were coordinated and had the right amount of rudder. Now you can't look at the wing but there is something else that can help you. If you look right below the attitude indicator you will see the

directional gyro. If your wings are level on the attitude indicator and you notice that the directional gyro is showing a turn, then you aren't coordinated. If it is showing a turn to the left, you don't have enough right rudder. This is a simple way to tell if you are coordinated without moving your head around to look at the turn coordinator.

Airfreddy.Com