

## How to watch the videos:

Make sure you watch also the **Sub Videos** as they are attached to some videos and included in some Chapters, showing either **common mistakes** or **Safety Issues**. Keep an eye on the overall programme on the website:

The instrument panel is mostly invisible in the videos. This is on purpose, since many of you fly different makes and models of aircraft. Not showing the panel in the videos limits possible confusion with your aircraft, whose instruments might be in knots, MPH or Km/H, in feet or in meters.

If you want to use these videos as a tool, I strongly recommend that you watch the videos with a **large and detailed** photo of **your plane's instrument panel** next to your computer. This will help you situate and get used to the specific instruments' positions. Have your **POH** open next to your computer to help **memorize limitations, and recommended speeds**. Also **ask your FI for confirmation of all such parameters** before going to fly with him. Study time and practice on the ground makes for better, easier, shorter, less tiring (and less expensive...) sessions in the air.

As you watch the videos-and obviously when you fly-you will **need to adapt the sight picture** to your plane's cowling, sighting devices, and canopy. As you watch the videos, a good-sized and accurate photo of **your airplane's references** would be of great help.

When I demonstrate a common mistake, I deliberately **exaggerate** the error, in order to make it **more obvious** and visible. Even if the actual mistake you make is **smaller**, the tendencies it generates, and their consequences **remain the same**.

I recommend that to watch each individual video a **number of times**, and memorize the picture of what the plane is doing from outside (ground camera), **what the pilot sees from inside** (top right camera), and what he is **doing** with the **controls** (bottom right camera). Once you've got it "imprinted," close your eyes and just listen to the commentary, this will help you learn to visualize and "imprint"the whole figure.

Remember: **include your aircraft's parameters** as you study the videos. As you progress, you will be able to assimilate more and more data. This is a good preparation for the increased workload you'll experience when actually flying

You can also stand up, and **simulate** the manoeuvre with your **hands**, and with your **body** as in a dance. Memorizing all of the ground references you see when airborne (using Google Earth, maps, photos), and around the airports or axis where you normally train, and where you go to compete, will **maximize your visualization process**.

The most important point is **WHERE and WHEN to look at WHAT**. During your static and walk-through repetitions, focus hard on **where and when to look at given references**. The more fluent and accurate you become at this, the easier everything gets. **The control inputs will begin to flow directly from what your eyes see**, to your hands and feet.

The overall scheme of the figure to be flown will be easy to imagine, and your anticipation will increase. This slows down the impression of being rushed. With practice and good visualization, everything falls into place, and becomes evident, almost as if in slow-motion.

Your FI needs to **adapt the roll rate and pitch rate**, as well as the **crispness** used in flying the figures. It needs to be adapted to (A) **your level** of training/learning, and (B) your **aircraft performances**.

In general, your control inputs will begin by being much smoother. Then, as you become used to the manoeuvre and to the plane you fly, you will become progressively more crisp and accurate. This is particularly true if you compete.

Flying a modern plane, when you will reach the Unlimited level, you will have definitely faster roll and pitch rates than in those videos, and you will fly a lot more sharply. But this will take a (long) while!

Even if, at first glance, all this seems routine and evident, my advice is : **Frequently"return to basics"**.

When a manoeuvre, isn't right, it's usually because some basic component is not right.

So, at the beginning of each season, give your self the time to review, and to practice, the basic building blocks of aerobatics during a few flights.

Since you began training, I recommend that you **roll both** left and right. The same applies to **snaps**. If you have two sighting devices, use both: sometimes the horizon is "better," or clearer/cleaner on the right side.

Remind yourself to find the easiest way to orientate yourself in space. Sometimes, to "find" your axis or horizon, you might have to look to the right. Anticipate and get used to this before flying, while studying this video series of demonstrations with the help of your FI. **Being prepared** to look on the "unusual" side will help prevent any disorientation in flight.

Physically for safety and health reasons, **it is necessary to get used to negative G's very slowly and smoothly**. This long and slow adaptation is **particularly critical for transitions from negative to positive G's**, transition that is the most difficult to sustain. Remember: remaining properly orientated, will help you in case of aerobatic airsickness. Always ask your FI to make sure you know where, when and what to look at.

Every time you start an **upward manoeuvre**, you have to **check your altitude, speed and sight picture**, as well as your Rpm (fix pitch prop). Then on **the top** of the figure, **again check the same parameters to decide** if you will **continue or abort** the manoeuvre, and **anticipate the exit's parameters**, depending on the next figure and/or the judging criteria.

Every time you start a **downward figure**, also check the **same parameters to be 100% sure** that you have enough of a **safe altitude margin to recover** from any, and all possible mistakes, **or Abort in time**.

Every time you start a **horizontal figure**, check **your sight picture**, especially while at knife-edge and /or inverted during the manoeuvre (check also your POH for **engine limitations**, oil pressure at knife edge or inverted). Take in **account any change in sight picture in case you vary your angle of attack, IE your speed**

As soon as **you use one input**, remind yourself that if you want to get stable on this new trajectory, you will **have to neutralize the input**. This applies to all inputs and controls. This neutralization will be soft at the beginning of your training sessions, and will become crisper, and more and more accurate with practice. With this, your flying will become very crisp and clean, and produce great scores if you remain accurate.

As a convention, when I discuss spins, **I describe the direction of spin from the pilot's seat** (IE from the cockpit, not from the ground). That means it will always be "left rudder spin" (as an example) when I start it. It's only a convention; some pilots call the direction of a spin according to what they would see from the ground (while they are supposed to be in the air). To me this is potentially confusing. That's why, for example, I prefer to say: "a left rudder negative spin." **Obviously, if the recovery instructions are: "opposite rudder," it will then be right rudder.** So make **your own choice of wording/thinking/visualisation with the help of your FI and stick with it to prevent any confusion.**

Concerning the expression: "**Engine's effect or Engine effects**" used in this aerobatic series of demonstrations, I do not go into details since there are hundreds of books on the subject. Just remind yourself that they exist -- and have an **impact on all manoeuvres**, sometimes a very large impact-- **depending on AoA, Speed, Rpm, and attitude**. Their severity / consequences can also vary depending on how each aircraft manufacturer opted to compensate for them, i.e. orient the engine's axis in relation to the fuselage and empennage, rudder size, use of static and dynamic trim tabs, and so on.

As you begin training, simply flying the overall figure and checking all limits and parameters, will represent a substantial workload. But, after a while you will have to focus **on the length of all the lines** since it's an easy criteria to judge. You will also have to become good at "cheating" on the radius of both positive and negative loops and lines taking into account up or downwind wind or downwind flight paths.

During positioning (wing high or low) corrections during **rotations on vertical up** lines, I suggest correcting using **elevator** instead of rudder, because this creates less drag. But do not hesitate to experiment, trying out both options, and **decide** what works **best** for you.

**To correct for crosswind**, I recommend the use of **ailerons** for the same reason, i.e.: less drag than rudder. Again, experiment and **decide** what **works** for you. But do it all the time, **every second of every flight!** Never stop correcting. Ever. It needs to become almost instinctive.

This applies to both positive and negative figures. Remind yourself that, for example, in a half snap (whatever the line/attitude) your rudder input into the wind won't have the same effect on the box management as a half snap using rudder opposite any cross wind direction; this is especially true if you then have few rolls on the same line, since these take time and will therefore emphasize the lateral displacement occasioned during the snap.

Aerobatic is a complex sport. While practicing, you have **to simultaneously deal with spatial orientation, sustain G's**, and perform crisp inputs with impeccable timing, and to fly as though you were presenting a series of figures in front of judges.

While doing all of this, you also factor in **wind corrections**, changes in **density altitude**, changes in outside references, changes in weather conditions... while remaining vigilant to avoid a potential mid-air collision with other traffic.

I recommend that you first study and analyse **what is easy and consistent for you**. Decide with your FI to start with “simple” stuff. Starting at a comfortable level (in terms of figures flown...) will give you more brain-power to work with wind corrections and positioning, since all your mental and physical won't be absorbed by the figure you are flying.