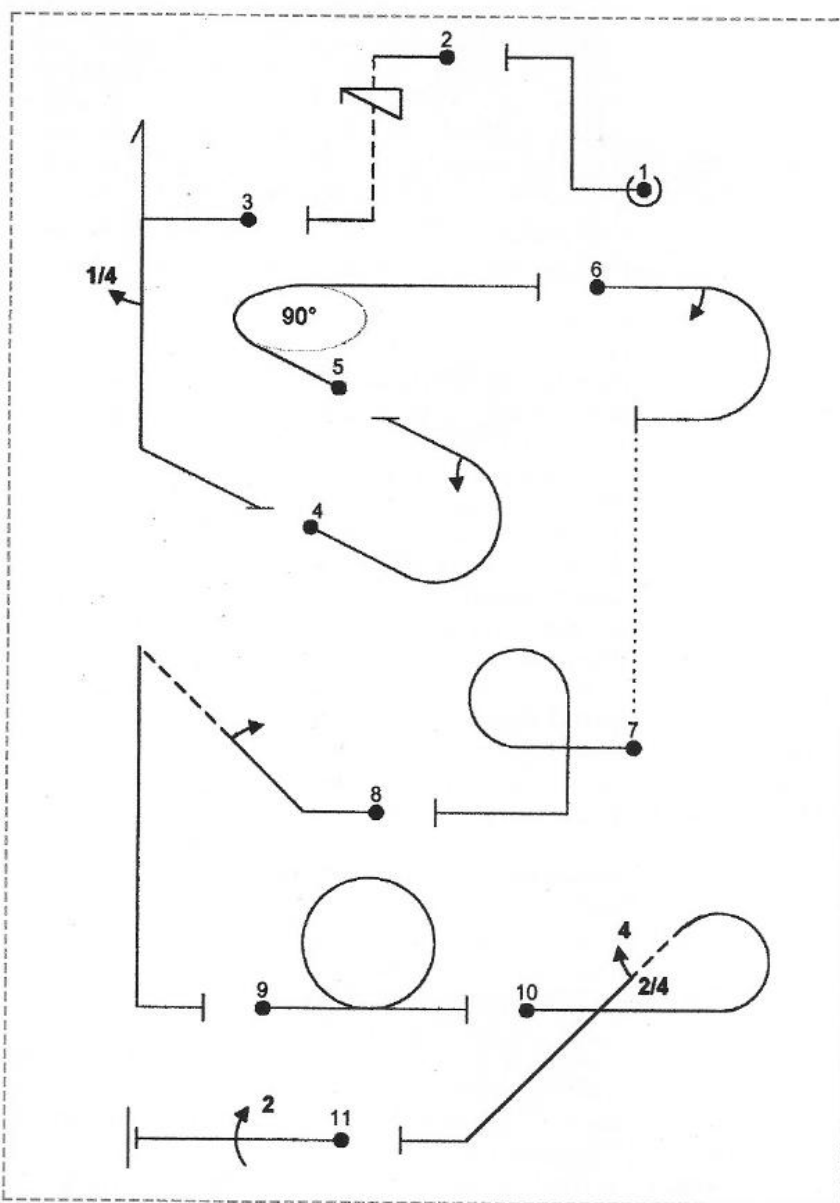


by Rob Dorsey  
IAC 389

## Through the Sequence Part II

### The 2001 Sportsman Known

We continue with our tour through the 2001 Sportsman Known sequence. Last month we discovered that this program provides some intellectual as well as physical challenges. Good, I like that. I'm using our 4-aileron, 450 Stearman to test this sequence since I reckoned that it pretty much fit the description of a "low performance" aerobatic airplane.  
I was right.



In the last issue we began to look at the 2001 Sportsman Known sequence which has caused some concern as to its difficulty and also some debate as to the flyability of this sequence by the baseline, Sportsman archetype aircraft. You see, about thirty years ago we decided that basing the difficulty of categories on the performance of certain aircraft types would be the most fair way of determining the content of the Known sequence. While we would never exclude higher performance aircraft from competing in Sportsman and, in fact, the club has always maintained a "fling what you bring" attitude toward the aircraft used in any category, we did intend to make the category flyable and winnable by a Clipped Cub or 115 hp Citabria 7ECA.

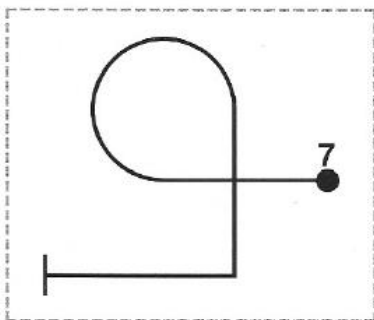
The promotion of diversity led to some interesting entrants. Bob Lyjak and Marion Cole each very successfully flew Unlimited during the late 60s in a 350 hp Waco Taperwing and a 200 hp Bucker Jungmann, respectively, and Giles Henderson dominated the Sportsman contests of the 70s in a 65 hp, non-inverted Clipped Wing Cub. Today each of those fine gentlemen would be told that they were wasting their time competing with such non-competitive

airplanes. This we call progress.

As more and more high performance airplanes were brought into the Sportsman and Intermediate contest arena there has been a tendency for the difficulty of the Knowns to creep up each year. Long time, experienced Sportsman competitors and those in the Extras, Sukhois, and even Pitts would probably prefer that the bar be raised regularly to match their experience and performance capability and, in a closed system, this would be okay, but what about the new or prospective IAC competitor with a Cub or 115 Citabria? These new pilots, regardless of their skills, look at a sequence that is designed for the hot iron and either hang back and don't compete or just leave the club altogether. Either way, we, the IAC membership and competitors, are the real losers.

New competitors often bring to the party an energy and enthusiasm for the sport that is welcomed and needed. Also, if you analyze the contests over the past ten years, you will see that early on, Sportsman and Intermediate were the largest categories by far with Advanced and Unlimited a distant third and fourth. Now the opposite is true with Advanced often the most populous group. I am no statistical expert but those data say to me that our fixed base of competition pilots are moving up in the categories and there is little or no back fill of new Basic and Sportsman entrants. If that doesn't worry you, I'll worry enough for both of us. To keep the sport viable we simply must keep the entry level competition categories attractive to newcomers.

So, having said all that, how does this Known stack up? Actually, not as bad as it looks. It is the inclusion of the "angular" figures that is off-putting I think. They look tough and are found on the same catalogue page with some other figures that really are tough. But these particular figures, the hesitation loop (No. 7) and the reverse wedge (No. 8) are absolute pussycats in almost any aerobatic airplane. The simple reason is, you don't fly them as they are drawn. Don't try. No, don't even think about trying. The catalogue drawing format calls for the depiction of square corners and sharp, peaky wedge tops. Please always remember this: Any corner in the Aresti figures are loop segments, period. They are flown with no more G than any other loop segment or a normal loop for that matter. It goes like this.



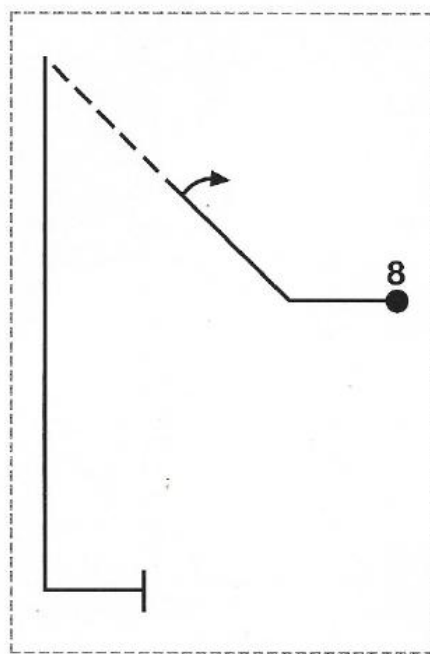
**The hesitation loop (No. 7) and the reverse wedge (No. 8) are absolute pussycats in almost any aerobatic airplane. The simple reason is, you don't fly them as they are drawn.**

You will have exited the split-S (remember?) going lickedy-split and you will have all the energy you need, if, that is, you left enough power on through the split-S pull to overcome the G induced drag and you've accelerated to Immelman speed—about 150 mph in the Stearman. Looking over both sides for positioning, we'd like this about center box if we can get it. We start a normal looping pull, not tight as if we were actually going for an Immelman, but, perhaps, even a little easier, say 3 Gs in the Stearman rather than the loop's usual 3 1/2. Now, nobody is suggesting that you be looking at the G meter here but in practice you can glance at it and then shoot for a feel of about 3. The idea is to allow the extra energy to carry us in a larger radius of arc than normal, arriving at the top at our usual top-of-the-loop speed, very slow in the big hog, about 50 mph, if that. Now we play the nose down gently, preserving the large radius and the altitude it conveyed. This,

then, allows us the easy luxury of stopping the pitch rate when we see the nose hit the vertical down for a count of "one-and-pull" to establish the vertical hesitation line of the back side of the figure.

Again, when we pull to level we do so at our normal looping G, never as it is drawn. The reasons are twofold. One, we are not "yankers" and have at least some modicum of finesse and a feeling for our dear old airplane, and two, we know that increasing the G will only succeed in increasing the angle of attack and it's attendant evil twin, induced drag. Remember, Pitts drivers, if you feel even a little buffet in the pull's you are pulling too hard. It's your speed. You can spend it in the lines or in the corners. It's your choice.

Figure 8, the reverse wedge, is another easy and familiar one that will be comfortable once you get used to the look, like seeing an old friend who just had their nose fixed. This is nothing more than a plain old, garden variety, reverse half-Cuban in wolf's clothing. Since we just mastered the





hesitation on the back side of Figure 7, we now only need to approach the hesitation on the vertical down line in this figure in exactly the same way.

Toward the upwind end of the box, but not too late lest your speed decay, pull up smartly to the 45 degree line and set it with an abrupt stick movement to neutral. Abruptly setting the line at the end of the pull is more effective in impressing the judges with your precision than a hard pull. Once on the line, most of us with lower performance airplanes will tend to roll too soon, which sounds wrong but think about it. When we point the Stearman 45 degrees up, even with a full 450 hp pulling, the speed drops off at an alarming rate. The instinct is to panic and roll immediately, fearing that the speed may drop and we will fall out of the figure. Practice will make perfect, but at least we must set our jaw and wait, at least long enough to make the line noticeable.

Roll in the "perceptible" middle of the line and once you set the 45 degree up line inverted, don't mess with it. Corrections in roll or pitch are easy to see here and are expected, almost anticipated in Sportsman by many judges. Don't play into their hands. Whatever you get when you roll inverted is what you have. Stick with it. When you get to the top, identified as before by the speed that you would consider your normal top-of-loop speed, again float the nose down, more quickly if you choose as there is no requirement for constant radii amongst the three pull corners of this figure. But at any rate, please do not haul the nose down in an attempt at flying the figure as drawn. It will be ugly at best and, at worst, you may stall the airplane resulting in either pitch hesitation (visible), a wing waggle (very noticeable) or, even worse a flick departure (very, very noticeable indeed). Try to fly the nose smoothly around toward the vertical down and pin it there with that abrupt centering of the stick to set the line, short though it be. Another "one-and-pull" is appropriate for timing here and we exit as we did from Figure 7, with a nice smooth 1/4 loop.

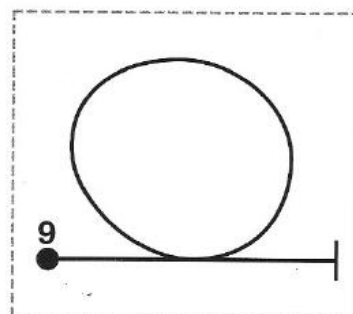
Here you may relax a bit for the perceived worst is over. Remaining are three of our old and trusted friends, a loop, a half-Cuban and a two point roll. And, that would be true were it not for the fact that the loop, Figure 8, is performed downwind. That means that the

**Ever wondered how the airplane could still fly around a loop with absolutely nothing on the airspeed meter?**

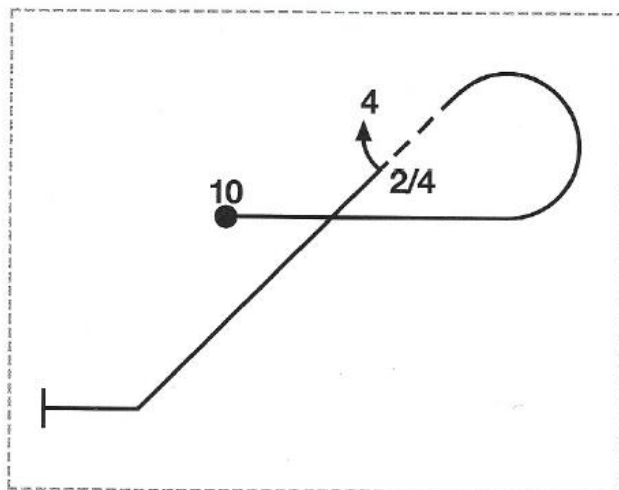
"float" across the top of the figure must be exaggerated and that exaggeration must be increased or decreased based on your best estimate of the wind. Your speed will be at its lowest at the very top of the loop, often less than the one G stall speed. Ever wondered how the airplane could still fly around a loop with absolutely nothing on the airspeed meter? Well, it's because our old friend and adversary centrifugal force is keeping the airplane in the loop but, since the G is less than 1 (that lightness you feel in the seat) then the stall speed is correspondingly reduced, often to below the threshold of the airspeed meter's ability to register. Anyway, let's just hope that you aren't the first to fly so that you have a chance to watch the others and "dope"

the wind. In any kind of

breeze you will wind up flying a figure which feels like it would look like this (figure on right) but in practice will look round from the position of the ground observer.



The half-Cuban, Figure 9, which comes next is almost mundane save for the fun little 2/4 point roll on the way down the back side. Just as the preceding loop, you must float across the top for wind correction since this figure is also done downwind. Don't be daunted even a little bit by this one, you Cub, Citabria or Stearman drivers, because the roll is done on the down line and you are gaining speed and energy throughout. Remember the primary rule of the point roll: The hesitation at each point must equal the





amount of time required to roll to that point. That means that in this case, our one hesitation at the ninety-degree bank position must be held for the time it took you to get there. If you are counting, it's "one-and-two." The "one" being the roll from inverted to knife edge, the "and" being the hesitation there and the "two" being the roll to upright.

For those in Citabrias, Stampes, Buckers or any other airplane with dihedral effect, as you roll from the knife edge portion of the 2/4 the airplane will have a tendency to "swoop" away from the roll direction. That is, if you are rolling left (my favorite) then the airplane will tend to wash out toward the right. You may not see it from the cockpit but the judges will, not to mention your neighbor, your new pals, your spouse, your kids or your new girl friend. It is one of the most amateurish looking things you can do in a flying machine, right in there with bounced landings or taxiing over a chock. Save us all the embarrassment, please. Remember to make that nose describe a half circle as you roll out—sort of a C shape around the reference point. If you try to "pin" the nose on one point, it will swoop. Yuck! In dihedral-effect wing systems you must fly the center of lift and not the nose to achieve a true roll with no ugliness. At the bottom of the figure we again radius the 45 degree pull to level and there we are, headed into the wind (at least I really hope we are) and ready for the final figure, a two-point roll.

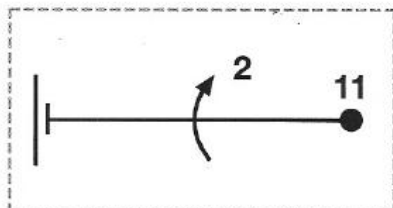


Figure 11, the two point roll. Sounds so precise and restricting doesn't it? Well, if you think back, most of us were taught our first roll

in two portions. My standard technique for teaching slow rolls was to teach the roll onto the back, inverted, and then the roll upright. It seemed to reinforce the establishment of the inverted portion of the roll and assured that the student was not depending on the ballistic nature of the airplane to keep the nose from falling. Well, this is just that primary exercise done to rhythm. The Prime Rule of point rolls, of course, applies, as ever. Count "one-and-two" and, it's over. Quick, wag those wings, turn down wind, and think about nothing but the landing. This sequence is so unproblematic that, particularly if you're in any Pitts, the hardest part of the flight is still to come.

The lessons in this endeavor are similar to those in life: Be proud of what you have. (How many people have an airplane to fly, much less an aerobatic one in which they actually fly aerobatics?) Fly it as well as you possibly can without undue comparison to others. You are your own best opponent. Don't be put off by the drawn figures and... get up there! You are amongst friends! ✈

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