

# FLIGHTWATCH

VOLUME 247

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NOVEMBER 2012

## FORMATION WEEKEND

I

### Getting the Rust Off

Skipper Hyle, a Southwest pilot, and Arnie Angelissi, a FAA flight surgeon, were kind enough to set up a formation clinic for the last weekend in September of 2012. Of late, Tony Stein, a retired corporate pilot and I have been doing some formation work from time to time. With sunset approaching on Friday evening, September 28, Tony and I departed Falcon Field with him flying lead and me flying the Kate on his wing. En route to Thomaston Airport (KOPN), Tony gave me several cross unders and also a couple of break aways and rejoins. In a cross under, if you are flying on lead's right wing, you make a small power reduction, drop back behind lead, banking ever so slightly in the opposite direction, bringing the power up, and emerging on the lead's opposite wing. In a break away and rejoin, lead gives a signal for a four or five second break, then gives you the salute, and then banks at about 60 degrees to accomplish a 180 degree turn, and after the assigned interval, you turn in behind lead calling "two's in." Lead then commences a turn, and two joins on the inside of the turn. This is accomplished by setting up on a 45 degree bearing line to lead and coming down the line on lead. Conceptually, it is simple. In application, it can be more complicated.

Arnie Angelissi was waiting on the ground, and in due course, Tony and I arrived over the threshold of Runway 12 at

11/6/2012



Thomaston where we accomplished a 360 overhead break. The break over the runway threshold is like the break away at altitude except lead departs the flight and lands and two follows in behind lead landing as well. Typically, the announcement made over the CTAF is "Two AT-6's on a three mile initial for a 360 overhead Runway 12 at Thomaston." As the sun was setting or about to set, Tony and I taxied in to park our aircraft on the ramp across from the hangars of Skipper and Arnie. Securing our aircraft, we made our way into town to the hotel, checked in, and then met our confederates for dinner.

Our confederates included Morris Ray from Memphis, a retired neurologist who is a pilot examiner and is also a check airman for aspiring formation pilots. Accompanying Morris in the back seat of his AT6 was Jeff Reed, a pilot with a lot of experience in flying under Part 137 conducting aerial applications (crop dusting). Also at dinner was Fred Johnson, a retired Fed Ex captain, and his back seater was Tony Stein, a pilot and financial planner from Ocala, Florida. Of course, the dinner conversation revolved around airplanes and fly-

ing. However, because of Tony Smith's work in financial planning and securities, I was interested in hearing his take on the economy. The plan was to be at the airport by 7:30 the following morning, so after dinner, drinks and the appropriate lies, we made our way back to the hotel in anticipation of the next day's flying.

**The Kate**



Ken Hills Photography

## **I.**

### **Geometry and Energy Management**

As we arrived at the airport the following morning, Skipper was at work setting up the first flights of the day. Initially, there would be a three ship flight with the aim of training Arnie and a two ship flight involving Tony Stein and myself. Tony and I got airborne first, and I flew lead. We flew to the south and southwest of Thomaston, and monitored the same air-to-air frequency as that employed by the three ship flight. This increased our situational awareness for the other flight maneuvering in the area. After the customary break aways, rejoins and in trail maneuvers (flying in trail

is where the second aircraft flies behind the first aircraft approximately one aircraft length with ten feet of step down below the lead aircraft), we made our way back to the airport for the 360 overhead approach for Runway 30. After we landed, the three ship flight arrived as well, and then it was time for me to fly the number three position in a three ship flight.

On a break away and rejoin, after the flight has broken up, the aircraft are in trail with the spacing being the result of the four or five second interval directed by lead prior to the break. The lead then banks 20 degrees to the left or right, and number two waits about four or five seconds and then turns toward lead with an angle of bank in excess of the bank angle of lead. This has to be done to get number two's nose inside of the turn and ahead of lead so that number two can cut lead off and rejoin lead. The sight picture you are looking for is to get on the 45 degree bearing line. You know you are on the 45 degree bearing line when the tail of lead appears over his opposite wingtip. Once you establish that line, you just keep coming down the line and closing in on lead until as you get fairly close to lead, you then momentarily increase your bank angle and reduce your power momentarily and set yourself on the inside of lead's turn. If during the course of the rejoin, there is space between lead's tail and his opposite wingtip, then you are going acute (getting ahead of the 45 bearing line). If you get acute, then you have to release some of your bank angle, get back on the 45 degree bearing line, and then be prepared for a fairly aggressive bank again towards the inside of the turn to get back on the 45 degree bearing line. If you fall behind the 45 degree bearing line, lead's vertical stabilizer

will appear to intersect his opposite wing (be inside the opposite wing tip). This requires the re-joining aircraft to increase its bank angle toward the inside of the turn to get back on the 45 degree bearing line to effect the rejoin.



**Fred Johnson and Morris Ray's Texans**

In flying the number three position, I had to wait for number two to rejoin first. While you are joining on lead, you have to be aware of number two which is in front of you. The longer it takes number two to rejoin on lead, the longer you have to wait to set up on the 45 degree bearing line and come down towards lead. However, unlike joining up in the number two position where you join on the inside of lead, in the number three position you join on lead's outside wing while he is in the turn. My initial rejoins in the number three spot were slow. This was from lack of practice. However, as we performed more rejoins, I became more comfortable with getting a pretty good cutoff between numbers one and two, getting my nose ahead of them, building up some momentum, and then more or less using a sling shot approach to cross under to two and one onto one's outside wing. Because of the

power limitations and drag of these old aircraft, you really need to have a pretty good bit of energy any time you are going to rejoin on the outside of lead's turn. After about five break aways and rejoins along with some cross unders, we made our way back to the airport and landed following which we briefed another three ship flight where Tony Stein would lead and I would fly number two. It was easier to fly in the number two position, particularly on rejoins. During this flight, my back seater was Tony Smith, and Tony took videos of the flight. This was the most enjoyable flight of the day because the four or five rejoins I flew were all stable and controlled.

By 4:30 that afternoon, it was time to have dinner at the airport with more pilot story telling including the adventures of Skipper and Morris. I will not repeat the stories, but I would assure you they were very entertaining. The discussion that evening included the weather forecast for Sunday, but we all elected to stay Saturday night and see what Sunday would bring.

Fred Johnson's SNJ is modified for air racing and has inscribed on the fuselage "Misappropriation of Assets." If you look at the aircraft carefully, it is apparent it has been modified for air racing. First, the rivets on the forward part of the wing cord have been concealed by applying an aviation compound. The same compound fairs the wing into the wingtips. On a regular Texan, there are screws securing the wingtip to the wing. On Fred's aircraft, the attaching screws are concealed beneath the smoothing compound applied to the wing.

Fred explained the angle of incidence of the wing has been lowered to reduce drag. However, this has given the aircraft a fairly abrupt stall characteristic. Finally, the ailerons are reflexed meaning the ailerons have been rigged so the ailerons are slightly elevated when compared to the trailing edge of the wing. Fred has raced his Texan at Reno and related it had finished the “silver” medal status.

### **The Kate**



## **IV.**

### **Return to Base**

Sunday had decreasing visibility and scattered or broken clouds about 2,500 feet, and the weather appeared to be deteriorating. This was not the ideal weather for formation flights where you have to keep the other aircraft in sight, especially on break aways and rejoins. Accordingly, Morris and Jeff set out for a return flight to Memphis while Fred and Tony Smith departed for their return flight to Ocala. Following their departure, Tony Stein and I mounted up for our return trip to Falcon Field. En route, we could see the weather at Falcon was deteriorating, and following our 360 overhead approach for Runway 31, we were on the ground and taxiing inbound to the hangar of the Dixie Wing of the Commemorative Air Force. The weather continued to

deteriorate with light rain, so we got the airplanes in the hangar as quickly as we could.

All in all, it was a great weekend getting the rust off and spending time with hard core pilots engaged in formation flying. For those of you have an interest in learning to fly formation. There are a number of organizations that provide this training. Like instrument flying, this requires a good deal of precision in your flying. Formation training and flying will make you a more disciplined pilot

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