

## From Pitts to Spits

For many of us, aerobatic flying was not the first calling in aviation. As children, the dream of being a fighter pilot often provided the spark to explore flight later in life. This dream would become “dumbed down” with the grim reality that the costs of owning and operating a real warbird are forever beyond one’s reach. The passion of aerobatic flight is often ignited by one memorable flight in an aircraft made for the singular purpose of aerobatic competition, stamping all other general aviation ships with a badge of mediocrity and compromise.

Remember what type of aircraft started it all for you? For me it was the P-51D Mustang and the Hawker Sea Fury. I had to find a way to fly one. With each hour of flight achieved as a student pilot, my warbird dream fell farther away. Before taking my private pilot test, I had a ride with Eric Haagenson of the Northern Lights in a Pitts S2B. This plane and pilot rocked my world. The take off acceleration and departure deck angle alone were worth the price. The handling and thought-following response made me forget my warbird dreams. THIS was going to be my little fighter!

The learning curve of aerobatic flying takes many years to flatten. Flying a stock Pitts S1T in Unlimited was satisfying and challenging. I needed more. I bought an SU26 and spent a 2<sup>nd</sup> year in Unlimited getting to know the plane before moving into air show flying. Now, I could really let it loose and do everything I imagined possible, or so I thought. Trips to OshKosh would leave me drooling over Mustangs and Bearcats even still, but I would deny myself the indulgence of the warbird fantasy.

Three years ago, I found myself at 3000 ft. AGL over the Niagara River in my SU26, going straight up for a ¾ snap and hammerhead. At the top, while getting ready to pivot, everything became quiet. Instinct and practice took over.

I shoved the nose down, hit the best glide speed of 180 kph, and aimed toward an abandoned Canadian airport I kept in my pocket for this possibility. Fuel supply was good....Primer pumped..... Instruments checked.... Emergency checklist exhausted and no response. I was not sure I would make it. A strong headwind and many trees below forced me to prepare to jump with a 1500 ft decision height. As I lost altitude, the headwind died down and I knew that I would reach the runway. The abandoned strip looked like old cinders with grass growing through it. I touched down gently with the best dead stick landing of my life. An old hangar loomed in the distance. Everything looked deserted. I was elated to be safe without any damage to my plane. I walked into the hangar and was floored. Floodlights lit the surgically clean interior, highlighting four of the most beautiful aircraft I had ever seen:

A Messerschmitt BF-109 with original Daimler Benz engine, a Hawker Hurricane, a Harvard II, and a pristine Supermarine Spitfire Mk IX. Was this heaven?

A cell phone call to my mechanic had the plane fixed (loose carburetor fuel line) in an hour. Names were taken, authorities contacted, forms filled out. Declaring an emergency and landing in Canada gave me a bunch of new friends. The owners of the abandoned airport had seen me practice and wondered if I could do their upcoming air show. Three years and three air shows later, we are all friends and a pilot is needed to display aerobatics in the Spitfire in the North East. Me? You are kidding, right? I thought you needed 200 hr. of Harvard time before jumping in a warbird. It seems that the Duxford, England crew responsible for these restorations and display flying have flown a Sukhoi, watched me fly, and feel I would be a better fit doing aerobatics in the Spitfire than a high time Harvard pilot. Amen to them for giving me this opportunity. It is one which I have to share. Let’s go!

I’m sure that there are a lot of other aerobatic pilots that wonder:  
Could they jump in a WW2 fighter and fly it well? What does their particular skill set have to offer to this type of flying?

What does a fighter share with a Pitts, or Sukhoi?

Will flying a war bird be the ultimate fantasy?

Is it as challenging as competition or freestyle flying?

Will it be safe?

Could a warbird ever be affordable?

I began with the required checkout in a Harvard ( the Canadian version of a T6). It felt like a big sturdy pick up truck . It was underpowered compared to a competition machine ,but oozed with charisma. I was to fly the blind, back seat with a demonstration of proper procedure and landing precision before being tossed into the Spitfire. This check out proved to be a couple hours of highly enjoyable flying. If I stopped right there,

I would have bought a T6. It is easy to fly, but challenging to fly well. Handling belies it's size, yet push the envelope and it fights you. You have to actually think. Don't do a hammerhead at low altitude. One third of the time, it will end up on its back, winding up into some flat, accelerated spin requiring a few thousand feet to recover. It can do snap rolls out of turning accelerated stalls, even with the ball initially centered.. You will use those rudders, especially when landing on hard pavement. Harvards want to take field trips and you must work to keep them honest. Respect this big teacher. Every warbird beyond it is easier to fly and land, the experts say. After a few hours of ground school and briefing, I find myself climbing into the Spitfire.

The Spitfire cockpit has Pitts S2B width at the shoulder height. The canopy is S1 size and can be left open or closed for flight. The rudders adjust with jackscrews for length and can accommodate any size. The seat tub requires a seat pack chute and moves up and down to give anyone the sight picture they need. The throttle quadrant falls into your left hand. Auto-mixture and an economy of gauges allow more focus on looking outside. A huge hydraulic control lever on the right operates the landing gear. A two-position butterfly lever on the upper left panel commands the compressed air driven flaps to be either all the way up or 90 degrees down. I am instantly comfortable. A rear view mirror is in front of the canopy. I knew that mirror on my Pitts was for dog fighting! The long nose gives a sight picture with visibility similar to the back seat of an SU29. The stick does not move laterally until 2/3 up from the bottom, where it articulates side to side above leg level. There is a circular spade grip with a brake lever. Rudders proportion the air to each side when the hand brake is squeezed. There are no foot brakes. Think Yak 52. Gun triggers on the grip are still present. There are war-like smells here. Oil, leather, wood, cordite? The bulletproof glass windscreen makes you feel safe from bird strikes.

Start: Lock hand brake, stick held back by right elbow, a minute of pre-oil button, 15 seconds of fuel pump with mixture off, 5 hard primer pushes, Auto mixture on, press boost pump and starter buttons with right hand, flip on mags- right, then left when fires, idle at 1000rpm. Wait for oil temp and radiator temp to come up, hit manual radiator door open. Wait only about 2 minutes to taxi. Now, you've got about 8 more minutes to taxi and run up before you must take off or shut down due to rising coolant temps. Stick back for run-up or your tail will stand straight up. Pretake-off checks are short by necessity. This fighter was made to scramble!

Taxi: The tail is so light that if you hit a rut with both main tires at walking speed, you could end up on your nose. Taxi with a 20 knot tailwind with 2 people sitting on the tail. Don't allow creep on a run-up and then stop it with brakes without pulling the power off first. Or, you will find that the Rotol prop is worth even more than the engine.

Take-off: Free swivel tail wheel and no lock. Steer with handbrake and rudders. Fuel pump on. Feed in the power. Push in hard right rudder to stop the left swing from torque and p factor. The tail comes up with neutral stick and, with the acceleration of a Pitts S2B, you are off. Switch hands on the stick. Take the gear lever out of its gate and push to the forward stop for two seconds. Change hands back to retard the throttle to cruise climb. The workload is low, allowing the pilot to focus on the mission at hand. The radiator door should be switched to auto, but there is a need for a constant scan of the radiator coolant temperature. If a malfunction allows this to exceed the specified limit, you could be on fire with a seized engine in about 30 seconds.

The pitch sensitivity is identical to the SU26. Rudders are powerful, and they are needed to arrest the large gyroscopic forces and p factor from the enormous prop. This is one of several traits that the Spitfire shares with the SU26 more than the Harvard. Ailerons are very sensitive and light below 220mph. They are still one handed for full throws at 260mph(max cruise at sea level.) By 320mph, they stiffen but are pleasant. Faster? Try 2 hands to reduce fatigue. Roll rate is about 80 degrees a second. The airframe was originally designed for 9G loads. In wartime, a dogfight might demand airspeeds from stall speed all the way to a maximum dive speed of 560 mph true airspeed with pilot strength, endurance, and G-LOC becoming more immediate limits than airframe strength.

Stalls are benign in every configuration, with gentle wing drops either way the norm. Gear and flaps down power-off stalls are at an unbelievable speed of 60 mph. In war time, fuel and weapons payloads of 3000 lb. would add 30 mph to this stall speed. Vy is about 160mph. Best glide is 150 mph. Max speed is 408 mph at 27,000 ft. This is roughly 320 mph at sea level.

Spitfires have been seen doing perfect hammerheads. This plane was designed to out dogfight anything and it did just that. Clean maneuvering flight below 150 mph is

discouraged though it just feels a little mushy below that speed. It does not do anything strange. Flying at 100mph in a pattern full of Cherokees is not desirable but possible.

Recommended entry speed for a loop is 260mph (max. cruise power). A 4G pull gives 120 mph at the top of a 2000ft. diameter loop. A clean airframe and “freight train” momentum force you to strain for a very long time or risk G-loc. You must get on the rudders all the way around to compensate for gyroscopic forces and p factor. There is no way you could carry out a display inside an aerobatic box. To do a conventional sportsmen routine would take a 5000 ft cube and leave you exhausted from straining. This is more physically challenging at 4G than at 10 G in the SU26.

In comparison, try a 2000 ft loop in a Sukhoi from 260 mph and you will have to claw over the top. It takes a lot of effort to keep the Sukhoi at that end of the speed range. The Spitfire has a Vne that is twice that of the Sukhoi and will try to get there quickly when the nose is down. Rolls must be kept positive to keep the big Merlin happy. 240mph to 300 mph works best as entry speed for most maneuvers.

The control harmony is as balanced as in any aerobatic competition aircraft under 260 mph. Spitfire pilots are quick to brag that they wear their aircraft and that a pilot feels one with the machine much faster than with other aircraft. This sounds and feels to me to be the warbird equivalent to a Pitts. In a couple hours of flight time, I have become comfortable with a full repertoire of aerobatic maneuvers. To preserve this aircraft, I will not exceed about 4.5 G or use more than Max. cruise power for aerobatics. Power changes are gradual. No negative G's. I limit takeoff manifold pressure to 6 lb. of boost, rather than the 15lb. allowed. (Merlins are pushed to 100 inches of boost at the Reno air races, often with catastrophic results). I am not trying to squeeze 408 mph out of this aircraft at 27,000ft. or get on the tail of a Messerschmitt. My goal is to display the grace and beauty of this historically important aircraft without degrading it.

Landing surprised me. A warbird entry was new to me. Approach over the runway at about 250 mph., 100 ft. AGL, and economy cruise power. Pull up on crosswind to pattern altitude with some G. Gear down at 160 on mid downwind, GUMP check, radiator door open and fuel pump on. Check for brake air pressure. Flaps opposite the numbers at 140 make you feel as though you hit a wall. Airspeed decays by mid-base to 105. Do a final GUMP check with prop pushed to full fine. Stick forces are light enough to forget trimming. Losing the engine here would allow you to dump the flaps and cross the numbers at 100. The high mass necessitates a trickle of power until the flare, holding a much flatter curving 180 approach than I was used to for a short field landing. To drop this aircraft into the local 2500 ft. grass strip, you have to be right on the numbers and let the normal 90 mph final decay to 75 mph right before you flare. The last 100 ft. is more blind than a steep approach in a Pitts. Need to go around? Pour the coals on smoothly and forget about flaps and gear. You will rocket away with 1660 hp pulling your 5500lb. Just don't dump the flaps under about 200 ft or you will sag enough to hit the runway hard. A 3-pointer or tailwheel-low wheeler is a necessity due to poor prop clearance, similar to the Su26. The gear has a nice oleo cushion feeling on contact with the ground, giving a gentle bounce if you drop it in. The narrow track allows a side-to-side rocking on rough ground that is disconcerting. The plane wants to go straight. The rudder has fantastic control down to very slow speeds where you finish it off with light braking. Don't get that stick all the way back until less than 50 mph or those beautiful elliptical wings will fly again. Stop and hit flaps up to help air flow past the radiator. Fuel pump off. You now have only 5 minutes to taxi before you must shut down or fly due to rising radiator coolant temp.

A 25-minute flight in my SU26, including a 10-minute full power freestyle sequence in the middle, usually burns 11 gallons. The Spit will use about 35 gallons in the same time with a 10 minute aerobatic session due to use of max. cruise power for most maneuvering. Fuel is the least of your expenses in a plane with operating costs that are 10 times that of a Sukhoi. The largest single expense is likely to be insurance. Plan on a minimum of 5% of hull value. You may take the non-aerobatic time that you fly for granted in your Pitts. In a warbird, you must make every second count. You may be limited to 15 minutes of total flight time per sortie to hold down costs and to keep the hours of flight time low after an expensive restoration. The ideal 1 hour flight profile for engine health may be trumped by other economic considerations. You must treat every aspect of the flight as a sequence to be judged.

Your time in a Pitts, Sukhoi, or Extra is likely to quicken a warbird check out, as long as you respect the increased mass of a fighter during maneuvering flight. The sight pictures and techniques for take-off and landing are remarkably similar. Your

competition honed yaw control and practice flying your big “gyroscope” will contribute to your safety. Insurance companies and owners of most WW2 fighters don’t realize that your time in Unlimited machines may be as close to predicting your safe operation of a warbird than T6 time. As a side note, a T6 pilot who I checked out in a SU29 had a much more difficult time than a Sukhoi pilot going to a T6. What does that tell you? It would seem that a combination of Unlimited aerobatic aircraft and T6 time would be the most complete preparation for flying single seat WW2 fighters.

I have learned that Warbird flying demands more precision in flying the non-aerobatic phases of flight, something we aerobatic pilots take for granted due to the ease with which we can let our minds control our planes. Aerobatic competition aircraft have become too easy to fly. Warbirds don’t have power-on stall speeds that you could beat running on the ground. They don’t tolerate full power all-at-once at the slow speeds of a go-around. Ground operations require a heightened vigilance due to increased mass and decreased visibility. Energy management and prolonged G must be considered to a much greater degree.

The warbird mindset can be adopted by many of us to make us better, safer pilots with the aircraft we already know and love. You may never get the chance to fly a Mustang. But don’t let that deny you the fantasy of flying a fighter. Realize that you’ve already got one. It’s called a Pitts. Or a Sukhoi. Or an Extra.

And I still want a Sea Fury.