R/C Warbird Flying Technique

by Jack Devine

NEW WARBIRD PILOT BRIEFING

The purpose of this article is to make an effort to prevent the unnecessary loss of model Warbirds. It is all too common to see a message posted on one of the internet RC sites where a new Warbird was taken up for it's first flight and the duration of the flight was about ten seconds and the final result was a severely damaged or worse a completely destroyed airplane.

As you enter this area of our great hobby you will quickly realize that it becomes a passion and a mindset that will help you preserve your models will go far in keeping you involved. As you learn and perfect the skills that make you a good pilot, your desire to build and fly these complex aircraft will dramatically increase. We want to make sure you get started on the right track.

This effort is a collection of information with real application to our hobby. It's designed to make the new pilot have a much higher chance of successful flight with his/her new pride and joy and to share in the experiences that make successful flight possible. A good Warbird should last many seasons and we hope the following articles will build a solid foundation for the up and coming Warbird generation. The skills and techniques we will discuss have been developed through experience. You can't buy experience but you can surly consider the points we discuss and realize that implementing them into your flight routines will make you a better pilot and will help you extract the full potential from your Warbird. Let's get started!

GROUND SCHOOL 101

Before you even consider attempting to fly a scale warbird you need to insure that all of the aircraft's systems are functional. The check and recheck plan here will insure the model is ready. If anything on the model checks out unsatisfactorily, DO NOT FLY. It's much better to come back another day than put your plane at risk. You have to understand that you are the ground crew as well as the flight commander and putting a dysfunctional aircraft in the air is extremely dangerous and not a wise thing to do. Setup on many warbirds is a complex task and you often find there are many distractions occurring while you assemble your plane.

Most planes go to the field in pieces and as the assembly process takes place great care needs to be taken that all of the assembly steps were completed to perfection. You make the decision and also bear the responsibility of a plane being airworthy. Take this seriously because the survival of your plane depends on it.

Check your batteries before every flight. If the batteries are even marginal take the time to recharge them. The little charging units that you get with a radio are good chargers but they are very slow. A full charge will normally take 16 – 18 hours. There are many battery system checkers on the market and you should use a device that loads your batteries as they are being checked.

Make sure your fuel tank clunk is free and in the proper area of the tank. Many models get stored on their nose and this often leads to the clunk in the tank bending around and going to the front of the tank. If the clunk stays there you will probably loose the engine on takeoff and a low and slow deadstick warbird is a disaster waiting to happen. Take the time to check the fuel clunk.

Carefully check all of the fuel lines and make sure they are secure at all connections. Also make sure you have used the proper diameter line and that the line is the right type for the fuel you are using. Glow fuel and gasoline fuel line is not interchangeable. All of your fuel should be filtered and make sure

you clean your filter regularly. Many modelers have a filter in the filling line as well as one between the carburetor and the fuel tank. Clean fuel enhances engine performance and it increases reliability.

Retracts also require a thorough check.. Pump the system up and see if it holds air. A pressure between 80-100 PSI is about normal and your should be able to get four or five gear cycles completed before you loose air pressure. If you run out of air after two cycles check for leaks first and if no leaks are found you most likely need a larger storage tank in the plane. I prefer the metal tanks over the plastic bottle tanks. If the retracts loose pressure find the leak before you fly. Repair it and then recheck the system.. Monitor the air pressure with the gear in both the extended and retracted positions. Also make sure the gear lock in the down position and if they are designed to lock in the up position insure that feature works as well. If a retractable tail wheel is used make sure the steering of the tail wheel does not interfere with the tail wheel retract operation. Double check all of the wheel collars that hold the wheels on the axles too. I have see many warbirds take off and leave a wheel behind rolling down the runway.

Flight control surfaces are next. Make sure all linkages are secure and tight. You are required to use some type of method to insure control linkages will not become disconnected in flight. Make sure they are properly secured and that they deflect in the right direction when commanded to do so from the transmitter. Make sure the throws are even and opposite flight surfaces have equal travel when compared to the opposite control surface. I am not saying they need to travel the same distance in each direction they just need to be the same distance movement when compared to the opposite surface moving in the same direction. When you compare the ailerons as an example. When the right aileron is up it should move the same distance in the up direction as the left aileron moves when the stick is moved in the opposite direction. Both should go the same distance up and both should go the same distance down when they are compared side to side. This is really critical on flaps if the plane is equipped with them.

Warbirds need flaps and they should be built whenever possible. They are extremely effective for landing and they dramatically increase slow flight stability. Also make sure that all of you flight surfaces are securely mounted and that all hinges are securely mounted and free of any bind. Double check every thing a second time and if anything is not right DON”T FLY. Fix the problem and then get ready to fly. Make sure you check all of your servo mounts as well. They will loosen up and losing a servo mount could be the end of your plane so look them over before you fly.

Check the engine mount and the muffler before every flight. Vibration is your enemy and it is difficult to remove all of the vibration. Carefully balancing the prop helps but there will always be some vibration. It will loosen everything over time so stay on top of this. Also check the prop for an signs of problems and don’t fly with a damaged prop. If you loose a blade in flight it will destroy the airplane. Don’t chance it. The money you spend to replace a bad prop is far less than replacing your entire airplane.

If your plane passes the complete inspection it’s time to put on your pilot hat and sunglasses and get ready to put your pride and joy into the air. The next unit will cover Radio range checking, starting and engine proveout, taxi and takeoff procedures.

Flying warbirds is different and there are several thing you need to know before you fly. Understanding the things that can happen before they do happen will aid you in being able to correctly react and give you the chance to enjoy the reason you took all of this on in the first place. Warbird flight is a thrilling experience and getting you there successfully is the reason we decided to do this article. We will discuss all aspects of flying a scale warbird from takeoff through post flight inspection and hopefully pass on some tried and proven information that will keep you involved with this great area of radio control modeling.

FLIGHT OPERATIONS

With the big day upon us the nerves will most likely be very tense and this is the time when many things can get overlooked and most of them lead to big problems so let's go back and recheck one last time.

Fuel the plane and make sure all fuel lines are securely fastened and properly routed. If you are using Air powered retracts make sure your onboard supply tank is pressurized to your desired system pressure. I'd recommend a minimum of 80 psi. Cycle the gear and make sure they function properly and that they lock in the down position when you command them down. If the gear checks out recharge the air tank to the proper pressure. Check the flight battery pack with a volt meter. If the flight pack is even marginal DO NOT FLY. Charge the batteries. If the batteries check out, insure you have control of your radio frequency and turn on your plane and radio and range check the radio. If anything appears abnormal fix the problem. Do not attempt to fly unless the radio system is 100% functional. Standing directly behind the plane, go through all of your flight surfaces and make sure you have everything moving the right direction. Always do this check from behind the plane because it's easy to make a mistake if you do this check from any other position and a reversed control surface is usually a fatal mistake for your plane. If everything so far looks good it's time for engine start-up. Secure the plane with some type of restraining device. Another person is always best. Make sure your helper is aware of what you are going to do and if necessary walk him/her through the start-up before you actually start the engine. Big birds and most Warbirds have high powered engines on them and the power may surprise your helper so make sure they understand exactly what you want them to do.

Start your engine and allow it to warm up to normal temperature. This normally will only take about a minute but it insures the engine will operate properly when you activate the throttle. Run the throttle up to maximum power two or three times and the engine should run through the transition to maximum power smoothly each time. If the engine sputters or hesitates correct the engine problem before you fly. The engine needs to be reliable and consistent and it should respond smoothly to every throttle change. Spend what ever time you need to here to insure the engine is properly adjusted. Deadstick warbirds are difficult to fly at best and the potential of having a deadstick plane to deal with on your first flight is dramatically reduced if you make sure you can count on the engine.

Ground handling is next and you need to practice taxiing the plane to learn how it responds to your radio input. Most Warbirds are tail draggers and the tail wheel input is the key in making the plane go where you want it to. Turn in both directions and make sure the plane quickly executes the turns on the ground that you are commanding through the radio. If the taxi capability checks out it's time to get airborne.

Check the wind sock and verify the wind direction. On your first flight it's best to fly in as little wind as possible and I would recommend you wait for calm winds until you have a few flights under your belt. I'm not saying Warbirds should not be flown on windy days I'm just saying you should give yourself every advantage possible on the first few flights.

Taxi to the active end of the runway and once traffic is clear call your takeoff. Taxi to the center of the runway and turn for departure. Take a good deep breath here because you may forget to do that for a little while and think about your takeoff routine. Release the elevator stick as we want the plane to run on the main landing gear until it has sufficient airspeed to fly.

The premature takeoff is the big killer here and avoiding it is not difficult if you stay with the routine. The elevator is the killer of many new planes because they jump into the air without sufficient airspeed. The throttle goes to maximum power and a torque induced roll to the left begins. Your reaction is to input maximum right aileron which further effects the stall and with no altitude and not enough airspeed disaster is just a second or two away. You need to manage

the throttle and input enough right rudder to keep the plane centered on the runway. Slowly advance the throttle and let the plane start it's takeoff roll. Don't worry about building speed quickly and DO NOT advance the throttle too quickly. The tail will come up as the speed comes up and once it does avoid adding up elevator. The takeoff speed you need will take a second or two to develop and you should be just passing through half throttle at about this point. As the tail comes up the rudder authority will increase and you will have to reduce the right rudder input to keep the plane going straight down the runway. Continue adding power and you should be getting very close to takeoff speed. Add just a touch of up elevator and your plane should break ground and begin it's climb out. DO NOT attempt to turn and keep the aileron input to a minimum until you are sure you are flying and the airspeed is continuing to come up. Use just enough up elevator to establish a gentle climbout. If you have ever watched a real warbird takeoff this is exactly what happens. You don't see them heading straight up two seconds after leaving the runway. You don't see them turn either until they are well established in flight. Keep using the rudder to keep the plane on course.

Once you have gained about fifty feet of altitude begin your first turn slowly and as the plane comes around and starts down the downwind leg take a big breath and throw your gear switch to retract the landing gear. Briefly look down and make sure you throw the right switch. The gear should begin the retract sequence immediately. Once the gear is up gain some more altitude and it's time to work on your flight trims. The goal here is to trim the plane so straight and level flight is established with no transmitter input. You should be at about ¾ throttle and if that seems a little too fast throttle back to a more comfortable airspeed before you trim the plane. Just remember you are not flying a trainer or a Cub here and the wing loading on your warbird is high so keep the airspeed at a manageable level. A properly trimmed airplane will give you time to relax a little bit and I'd think it will go along way to get your knees to quit shaking too. After flying a couple of circuits you should have the plane trimmed for hands off level flight. If the plane is difficult to trim then something is set up wrong and you should land as soon as possible but don't panic. Think about what is happening and input the commands you need to keep your plane flying as normally as possible. Avoid over controlling the model. Warbirds respond very quickly to transmitter input and in most cases a little input results in allot of reaction from the plane. If the plane seems overly responsive switch the radio to low control rates on the ailerons and the elevator if your radio is equipped with these features.

Make nice smooth inputs and you'll find that a Warbird goes exactly where you tell it to. Don't attempt any fancy flying until you have the plane trimmed for level flight. You can do all the hotdogging after you are comfortable with how the plane flies. Turn the plane in both directions so you get an idea of how it will turn. Warbirds need to be flown with both rudder and ailerons and use the elevator to keep the plane at consistent altitude during your turns. If you want a warbird to look good in a turn use the rudder to help you turn. You need to become familiar with the rudder because you are going use the rudder in the landing routine. Warbirds force you to use the rudder and many of us have learned to fly without using the rudder. You will be amazed at how well your plane will turn when you apply a little rudder. Now Enjoy your model. Fly nice smooth circuits and get to know your new plane. I'd highly recommend you stay away from the rolls and loops for a flight or two.

The next step is to figure out how your plane will react in a stall. It will help you recognize the minimum safe airspeed for your plane and if there is going to be and adverse reaction to the stall. Some planes just start to buffet a little bit and stall straight forward and others will snap violently and you need to be able to react to either condition. I recommend you do this on the first flight if you are comfortable with this routine. If not you need to get it done before you start putting the plane through any advanced maneuvers.

Climb to a safe altitude. Altitude is the safety blanket and you need to make sure you have enough of it to recover safely. Fly the plane in the traffic pattern and apply just enough up elevator to start climbing. Start reducing the throttle and slowly increase the up elevator until the plane stalls. If the

plane just buffets and kind of mushes forward release the elevator and add a little power. If the stall continues drop the nose and gain some airspeed and fly out of the stall. If your plane snaps don't panic. Get the nose down and add power. Stability should return quickly and once your flying surfaces are actually flying again you should quickly regain control. Get the plane leveled out and relax and take another deep breath. You have just found your absolute minimum flying speed and you crossed the line and saw how your plane reacted. You must stay above that airspeed to avoid disaster while you fly your plane.

Now the only mandatory maneuver, LANDING!!!

Every flight will end with some type of landing and if you prepare and set it up properly you will have successfully completed another flight. This routine needs to be automatic. Setting up the plane for landing is not difficult but you need to understand again that you are flying a warbird. Warbirds have flaps and if your model has them - Use them. Throttle back in straight and level flight and drop your flaps and see what it does to the flight characteristics of your plane. It should immediately start to slow down and if the power level is above half throttle it should start to climb. At low power it will continue to slow down. You manage the decent with the throttle not the elevator. This is important and you need to make sure you understand it.

Now let's set the landing up.

Call your landing so the other pilots on the flight line know your intentions.

Make a straight and level pass in front of you and reduce the throttle to about half and drop the landing gear. Fly another circuit and visually verify your landing gear is down. You should be 100 feet up as you turn onto the down wind leg. Drop your flaps and correct any altitude change. I dial in about 5 degrees of down elevator mix with the flaps through the coupling available in my radio and this keeps the plane flying level. It also gives me a shorter list of things I have to do as the radio automatically takes care of the trim change after dropping the flaps. Turn onto the base leg and you should still be at about 100 feet. Turn final and start your decent as you reduce throttle to about 1/3rd. Point the airplane at the touchdown area at the end of the runway and control the decent with the throttle not the elevator. To steepen the decent reduce the throttle and to decrease the decent add a little more power. Steer the plane to touchdown with the rudder. Use the ailerons to keep the wings level. The entire approach should be at about a 45 degree angle. This seems pretty steep to some pilots but this is the right method. At about ten feet of altitude you should be just over the end of the runway and if everything looks good reduce the throttle to idle and at about three feet start your flair. Let the plane settle on the mains and do not force the tail down with up elevator. Use the rudder not the ailerons to keep the plane going straight and as the speed bleeds off the tail will come down on it's own and then you can steer with the tail wheel. Forcing the tail down can cause a takeoff and at this airspeed and low power you will certainly stall and we know the result.

If you are not satisfied with the approach simply add power slowly and keep the wings level. As the power comes back up so will the airspeed and the plane will start flying again. Climb slowly and do not attempt to turn until you are sure you have enough airspeed to do it safely. Just remember that if you are going to miss the approach add power slowly. You will want to jamb the throttle wide open and this could cause the dreaded death roll that has been talked about before. Don't panic just add power slowly and start a gentle climbout back to your landing setup altitude and try it all over again. Don't force a landing any more than you would force a takeoff.

Once you have your plane back on the ground and you are breathing normally again analyze the entire flight and think about what you could have done to improve it. As you practice these two routines- Take off & Landing they will start to become automatic. One step naturally leads to the next and with a little practice you will master both and you should have your plane for many flying seasons. I practiced these routines many times before I ever attempted an actual flight. The steps have a natural transition and with a little practice they really work.

I had the honor of knowing a very special man that was an instructor pilot and a combat veteran of over 50 missions in WWII. He saw me crash my first Corsair and he took the time to tell me what I had done wrong. He became a great friend and we developed what you see in these few pages. I took advantage of what he knew and I became a better pilot because he took the time on that first day to ask me if I knew what I had done wrong. I was very upset that day but I knew by the tone in his voice that he felt as bad as I did seeing me sort through the pile of broken airplane trying to find out why the crash had occurred. He told me there was nothing wrong with the plane and that stung a little but in the next couple of hours I found out just how right he was. He knew the Corsair like the back of his hand and he often called it the "Bentwing Bitch" but he loved and respected the plane and he took the time to share what he knew. The reason I agreed with Paul to put together this article was to pass on to other pilots what he had passed on to me. It was an honor to know him and call him my friend.

Welcome to the wonderful world of Radio Control Warbirds!!!!

Jack Devine