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President's Message

Spring has sprung! It’s time to get out and enjoy our planes! I have seen lots of social media posts about upgrades, good rebuilds and installs on propellers, ADS-B installations, extensive conditional inspections and overall excitement for the upcoming flying season. Enthusiasm is in the air for another fantastic season of RPA events!

As I write this article, SUN ‘n’ FUN in Lakeland, Florida, just completed its annual event that marked the informal start to the airshow and flying season. Our Southeast Director, John “Saber” Blake coordinated a fantastic RPA HQ with a tent, beverages, evening events and some outstanding camaraderie. Reports are that the Warbrid flying, which our RPA brothers and sisters conducted while in Lakeland, was Best in Show for Symmetry and they voted themselves the best-looking pilots at the event! A big snappy salute goes to Saber and his crew and to Bill and Kim Mills for hosting the HQ area. They made sure everyone felt welcome and that there was a place to tell hangar stories, regardless of the validity. I heard the brotherhood and squadron-like feel in the tent was second to none.

There is an article in this issue on the debut of the Great Southern Warbird Fly-In. Saber, on behalf of the RPA, coordinated with EAA Warbird Squadron 24 to host a fantastic end-of-year event in December of last year, coincidentally also in Lakeland. I continue to see cross-Warbird (i.e. not just one type model series of planes) and cross-signatory FAST training, as our Warbird community pools its resources to create more flying venues. Be sure to read the article and understand that YOU make an impact on our flying community when you work with other Warbird pilots to put on joint events. Your contributions are not necessarily limited to conducting only FAST training; you can do so much more!

I started my message this month about winter maintenance. If it was too cold or if time got away from you this winter, it is not too late. This issue has a fantastic article by Craig Payne that describes various modifications that are available for your plane. Be sure to read about the many options and benefit from Craig’s insight on this topic. I have stated before that Craig has been wrenching on CJs and other planes since before the RPA was formed. This article reveals his considerable experience.

I can’t let an issue go by without mentioning safety. Safety needs to be a mindset for our community, and we need to learn from recent events. Rich “Wink” Martindell gives us a timely article in this issue on the subject of traffic patterns. His article is inspired by a recent runway collision that involved a Warbird. A CFI was severely injured and the pilot of the non-Warbird was killed. By the time this issue is published, fewer than 90 days will have passed since the date of that event. Be sure to read Wink’s take on this particular safety issue. We must learn from the situation and always evaluate carefully our own flying operations.

Glance at the Contents page and check out the 12 articles that were submitted by our pilots and journalists. I am proud of these articles. This magazine showcases our events and brings relevant subject matter forward for thought on so many topics, from safety to maintenance to medical.

The last topic I want to address is FAA Order 8900.488, which was issued over the winter. This document is the Policy Update for Issuing a Certificate of Waiver or Authorization for an Aviation Event. This 178-page FAA publication has been summarized and the RPA very recently sent out communications via E-Com to our membership. It was designed to help pilots understand the implications of the changes. The bottom line is that if you fly in waivered airspace with your FAST card, you need to understand how the rules have changed in order to ensure that you do not inadvertently receive a violation for doing something that used to be legal, but which is now no longer allowed. The FAA document is written for Aviation Safety Inspectors (ASIs), not pilots, so it is a challenge to decipher. Make sure you reference the E-Com from the RPA or the FAST Website PowerPoint to understand how the new regulations may apply to you and to your flight operations.

In closing, please make sure to note the ads in our magazine. Revenue from them is what makes this magazine and its great content possible. If you have a need for any these products or services, please consider our loyal advertisers before making a decision.

Hartley "Postal" Postlethwaite
In view of my screwup in the Winter issue, I’ve added Matt Lazar to this issue’s contributors list. His byline should have been on the RPA China Trip article. It was ready-fire-aim on my part. Sorry Matt... Speedo

When you see any of the people on the above list, please thank them for their contributions to Red Alert. Without them we’d have a lot of empty pages.

In this issue I’ve written an article on parachute basics. While I’ve never parachuted out of a plane, I now have a better understanding of how one should buy, wear and use a parachute. During this process, my friend, Robert Marshall, had me don and pull the rip cord on a parachute he was about to repack. Not really dramatic, but now I have the feel for pulling what it would be like.

In this issue we’re featuring photos from a new group of photographers who covered ‘The Great Warbird Gathering. I always love to see what other people “see” with their camera. The article begins on page 22 and take note of the photographers’ bylines. I’m sure you’ll be seeing more of their work on the pages of Red Alert in the future.

In the Summer issue we’ll have articles on the DFW Formation Clinic, Sun ’n’ Fun and All Red Star. One new event and one of the RPA’s oldest. If you’re new to the organization, you must attend one of the events. There you’ll find an opportunity for excellent training and you’ll also meet some of the nicest people in the warbird community.

Editor’s Note

Articles should be 500-1,500 words in length in MS Word or a similar software (cannot use Power Point files). We are always looking for good event coverage, technical articles and anything safety-related. Please do not embed photos into your text file.

Photos should be 5x7 inches minimum at 300dpi. Sorry, most iPhone photos are generally too low of a resolution to reproduce well enough for print. But they’re getting better...

2019 Issue Deadlines—Summer, July 1; Fall, October 1

Please send submissions to:
Robert "Speedo" Genat: robertgenat@yahoo.com

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Have you ever noticed how easy it is to fly on the wing of some Flight Leads and not so with others? Did it seem like the Flight Lead that made it easy was just smoother than the other Flight Lead that was occasionally erratic, rough or unpredictable? Let’s talk a little about how you can be that “smooth” Flight Lead and be the one that wingmen like to fly with.

Wingmen perceive the Lead’s smoothness in four dimensions. You will have to stay smooth and in control of each of these four dimensions to win your wingmen’s praise. Let’s break down each dimension and see how to keep them all “smooth.”

The first dimension we’ll discuss—and usually the first to be noticed by your wingmen is pitch control. A smooth Flight Lead will always strive to maintain positive G-loading on his plane and avoid abrupt changes in G-loading. Anytime Lead unloads to less than one G, the wingmen’s eyes get bigger, their hands involuntarily tighten on the stick and their palms begin to sweat. It’s just an unnatural feeling for most wingmen to have to push on the stick and get that feeling of being light in their seat in order to stay in position.

As a Flight Lead, strive to avoid pushing the stick to get the nose down. Whenever possible use some bank to get the nose to fall on its own without having to push it down. This requires patience and thinking ahead to avoid being boxed into a push-over maneuver (more on this later.) Develop a feel and awareness for that “light in the seat” feeling and always avoid it when you have folks on your wing. NEVER mix in any bank input with less than one G on your plane...unless you want to see a look of terror on your wingmen’s faces! Pushing and rolling simultaneously is NOT what wingmen want to experience.
The other pitch control aspect to talk about is abruptness, or rate of change. If you are smooth and flying with experienced wingmen they should have no problem with wingwork that reaches three, or even four Gs; if you build up the G-loading gradually with a controlled and steady rate of change. But if you snatch the Gs in too quickly and abruptly to just two-Gs, it might spit out the best wingmen.

Our second dimension is roll control. Roll control is very much like pitch in that it isn’t the total amount of roll (bank angle) you use that defines “smoothness,” but rather, it’s the rate of change perceived by the wingman. And the rate of change needs to be constant. In other words, if you are leading wingwork and rolling at some rate of roll (say 10°/sec), maintain that roll rate throughout the maneuver. Don’t ratchet the roll by abruptly increasing or decreasing the roll rate.

So now you're wondering how to use your attitude indicator to maintain a constant roll rate. NO, stop right there! Instead, get your eyes out of the cockpit and look out the windscreen and canopy at the world’s biggest and most accurate attitude indicator—the horizon. Roll your plane so that the horizon moves in your canopy at a constant and steady rate. This is MUCH easier and safer to do than to try to monitor your roll rate while staring at your little attitude indicator.

One last tip on roll control: start and finish the roll with a gradual increase/decrease in the roll rate. Avoid the surprise or abrupt start or finish to your roll. Begin your roll slowly then smoothly go to the steady roll rate you want. It’s as if you’re saying to your wingmen, “OK guys, here comes a little roll...and now you know it...so here we go with an increased, but steady roll rate.”

The third dimension we’ll discuss is power and throttle control. Your left hand has to do two things with the throttle to be a “smooth” Flight Lead. One is to avoid pushing/pulling the throttle lever too far forward or aft. Avoid the first and the last bit of the throttle lever’s range of motion. If you use too high a power setting and then roll away from #3 and #4 while maneuvering, they may not be able stay in position even after they firewall their engines. Conversely, pull too much power off, turn into #3 and #4, and they will be unable to stay behind you. And remember, just because your flight is staying in position at any given power setting is no guarantee that that power setting will be appropriate when you begin a roll.

Whether you’re flying a Yak/CJ or a jet, always be aware of your power setting and how much excess power you have left for the wingmen to use in order to stay in position. In general, when leading formation maneuvering, strive to use the lowest practical power setting for the situation. You must balance how much power you need to maintain your energy and how much that last wingman on the outside of the turn will need to remain in position.

While a smooth Flight Lead will move his throttle as little as possible, sometimes you just have to change power settings. When you do move the throttle, move it slowly and deliberately. Try to move it so that the wingmen will not even notice that they have had to increase/decrease their own throttle position. In other words, try to make your wingmen’s left hands feel like they never had to make big abrupt movements to stay in position.

OK, now it’s time for the fourth dimension. The first three were all physical in nature. They involved your hands, your eyes, and the feeling of your butt in the seat. The last dimension is the one between your ears. No matter how smooth your hands are on the stick and throttle, if your brain isn’t in the game your wingmen will suffer with another unsmooth (is that a word?) Flight Lead.

Your head, as the fourth dimension, is probably the most critical aspect to being a “smooth” Flight Lead. Your brain starts that smooth flight before you even begin your transition from one maneuver to the next is in a logical, predictable and timely manner. These transitions and how well the flight lead accomplishes them are what wingmen are often perceiving as smooth (or not so) Flight Leads.

Tip of the day: You can and should develop, practice and refine all four dimensions of smoothness by flying solo. With phantom wingmen, practice an entire flight profile as the Flight Lead. Lead a formation take-off, wingwork, extended trail, and the other maneuvers—all without anyone on your wing. Learn how to smoothly control your pitch and roll during maneuvers using the horizon. Learn what roll rates you need to execute various maneuvers. Learn what power settings work in your airplane to maintain an appropriate energy level but still leave the wingmen some extra power to maintain position. Learn how to transition from one maneuver to the next in a seamless manner. Practice leading some wingwork and then entering into extended trail with enough energy.

Practice and learn all these things without anyone on your wing. Then when you have real wingmen out there beside you tomorrow, they will come back from the flight thinking, “Gee, this guy is a really smooth Lead.”

You cannot be a smooth Flight Lead when you are ad-libbing the entire flight.
We fly two different forms of trail: extended trail (sometimes referred to as "offset trail") and tail chase. Each has its own distinct characteristics.

**EXTENDED TRAIL**

The purpose of extended trail is to teach pilots the use of lead, lag, and pure pursuit to control position relative to another aircraft. It just so happens that when the skill is mastered, it’s also one hell of a lot of fun.

In extended trail, all pilots in the flight will set the throttle at the beginning of the exercise and leave it in that fixed position throughout. The wingmen then use only lead, lag, and pure pursuit to manage position.

The extended trail position is defined laterally by a cone emanating from the six o’clock reference of the aircraft ahead. The inner limit of the cone is 30° out from the six o’clock, and the outer limit of the cone is 45° out from the six o’clock. The range of the extended trail cone extends from 200’ to 500’ behind the aircraft ahead (500’ to 1500’ for jets). Since each pilot is operating within a 200’ to 500’ range, the flight leader will not see an even distribution of airplanes when looking back at the wingmen.

The wingman’s challenge is to remain within the range and lateral limits of the maneuvering cone using only geometry. The flight leader will typically fly a relatively aggressive lazy eight maneuver to present the wingmen with turn circles to work with. Without vertical, horizontal, or oblique turn circles, there is no opportunity to use lead/lag.

For the wingmen, monitoring the nose position of the aircraft ahead is the best predictor of the action to take in order to remain in the defined zone. As the leading aircraft’s nose position tracks up, it will bleed off airspeed. The following aircraft will initially begin to close on the aircraft ahead—the immediate action should be to fly lag to prevent closure. As soon as the nose of the aircraft ahead falls through the horizon line, it will begin to accelerate away from the trailing aircraft—the immediate action of the trailing aircraft should be to pull the nose down into a lead pursuit position. This action will arrest the potential for increasing range between aircraft.

The lazy eight maneuver is very dynamic, with airspeed and altitude constantly changing. As a result, the trailing aircraft are maneuvering continuously, shifting between lead, lag and pure pursuit, as necessary, to maintain position.

We fly offset, within the defined cone, for a couple of reasons. First, because of the parallax effect, the offset position presents the pilot with better visual references for determining range and closure/extension rates. Second, the offset position keeps the trailing aircraft out of the vortices, and prop or jet wash. Transition through the six o’clock position (yellow zone) is normal during dynamic maneuvering, but the wingmen should not “hang out” there.

**Extended Trail Entry**

There are several ways for a flight leader to initiate extended trail. The most commonly used are the entry from echelon and the entry from close trail. From echelon, a one-second pitch out at 120 knots (200’ per minute) will place the wingmen in the 200’-500’ range, at approximately 400’, while a two-second or longer pitch out will place them outside the range and should be avoided.

From close trail, while flying wings level, the flight leader can initiate a 30° turn away from the flight and have the wingmen initiate their turns to fall into extended trail when they have the proper interval.

No matter the entry, the flight leader will make a radio call: "Redstars, go extended trail" and each wingman will, in turn, call in position: "Redstar 2, in; Redstar 3, in; Redstar 4, in."

**Extended Trail Exit**

When the flight leader has completed maneuvering and is ready to exit extended trail, a 45° level turn can be executed and held that until all the wingmen have stabilized behind. This technique has several advantages. First, it provides the wingmen with a stable platform. Second, it presents a turn circle to the wingmen so that, no
The purpose of tail chase is to teach pilots how to fly the same path through space as the flight leader, using power as a means to maintain a specific interval. Essentially, the wingmen are flying in Lead’s smoke trail. The throttle is not set, and power is the primary means to maintain position. Lead/lag geometry can be used as a secondary means to maintain position if the wingman has insufficient power to hold position or too much energy at idle power to keep from closing on the aircraft ahead.

In tail chase, the #2 wingman is extended behind the flight leader from a minimum of 200’ (1000’ for jet aircraft), out to 1500’, or whatever distance the flight leader has briefed. The #2 wingman sets and maintains the interval in this range, as briefed, and the challenge is for all the following wingmen to match that interval while flying along the same flight path.

Tail chase is typically employed in situations such as air shows, in ingress and egress from simulated targets or, for example, a low-level canyon run, where maintaining a prescribed, precise flight path is essential to the safety of the wingmen.

**Tail Chase Entry/Exit**

The same entry/exit techniques employed for extended trail can be utilized for tail chase, with the pitch-out interval increased to as much as seven seconds to put the aircraft at the aft end of the 1500’ range.

The flight leader will initiate tail chase with a radio call: "Redstars, go tail chase" and each wingman will, in turn, call in position: "Redstar 2, in; Redstar 3, in; Redstar 4, in."
The first time I flew with Todd “Banger” Bohlman in his Yak-52, he handed me my parachute while still standing on the ramp. I put it on and adjusted all the straps for a proper fit. Once in the plane I felt very comfortable, more comfortable, in fact, than I usually am as a GIB. We backseaters usually climb in and pull on the chute that’s already in the seat. I recall times when the chest strap wasn’t secure enough or the shoulder straps looked more like epauletts than parts of a parachute harness. A parachute is not a one-size-fits-all gadget. To be effective, it must be adjusted properly. That adjustment, or fitting, should happen on the deck, not in the cockpit. It would be an ironic tragedy if you were to jump safely out of a stricken aircraft, only to slip out of the improperly fitted parachute harness during your descent.

To find out more about parachutes in general, I contacted Robert Marshall. He’s an experienced parachute rigger with over 3,000 jumps to his credit. His business, Roberts Air Service, is located in a hangar in Ramona, California. In addition, he’s an A&P/IA, a private pilot, and sells and repacks parachutes. He has been doing this for over 25 years.

Robert explained that there are two basic types of parachutes: (1) a seat pack and (2) a backpack. Most warbird seats are designed for a seat pack chute. The major drawback of the seat pack is the lack of mobility when moving in or out of the cockpit. And do we even need to call to mind the issue of the “pant load” look as one ambles down the flight line? A backpack chute, on the other hand, is more comfortable to wear when in or out of a plane. It also offers a bit more stability when opening than does a seat pack chute.

The harnesses on both types of chutes are similar. The harness fits like a vest over the shoulders with a single chest strap and two leg straps; to the left is the D-ring. Fitting a harness is very important and can only be done properly outside of the cockpit on the deck. The shoulder straps must be adjusted so the chest strap crosses the chest, as opposed to high under the armpits or low on the stomach. The leg straps go around the upper thigh near the groin. It is each pilot’s job to ensure a comfy fit in this area, if you know what I mean. Neither the leg nor chest straps need to be tight, just snug. And while in a standing position on the ground, arch your back and spread your arms. This is the ideal position when free falling. If you can’t do this on the ground, using the parachute effectively in an emergency might be more difficult.

Once the chute is on, gather up the tail ends of the straps and tuck them neatly under the elastic band on each strap. You do this to prevent one of those loose ends from snagging some part of the aircraft as you jump out. Each cockpit should be surveyed for structural elements that could hamper a clean exit.

Abandoning a stricken plane in flight must be done as quickly and as deliberately as possible. Once the commitment is made to bail out, it’s time to go. Unbuckle and clear the seat belts. Open the canopy. Remove the headset. If you’re wearing a helmet, disconnect the jack(s). If you think it’s difficult getting in and out with a chute on, think about how much more difficult it will be in a 100-knot wind. In a Yak, CJ or T-34, you can stand on the seat and jump for the wing (you won’t hit wing as the airstream will blow you back towards the tail); or you can sit on the canopy rail and fall backward. Ideally, if you have the presence of mind, roll the plane on its back, apply forward pressure to the stick, and wait to be launched as if by an ejection seat.
There has always been a debate as to which side of the aircraft is preferable in the event of a bail out. One theory advances the notion that it’s better to consider the direction of propeller rotation and bail out on the side where the propeller vortex will help pull the individual down past the tail. Hitting the tail is the biggest hazard for anyone bailing out and this is another good reason to wear a helmet.

Once free of the plane and descending, it’s time to “Look – Reach – Pull.” Look down to find the D-ring. It is on the left side of all parachutes. This ensures that you are grabbing the D-ring, and not the harness. Reach for the D-ring with both hands, grasp it firmly and Pull straight out and away from your body. Ejected by a spring, the small pilot chute will deploy first, followed by the main chute. You can discard the D-ring and the wire attached to it.

Once the chute has deployed, you need to look up to locate the toggles. Toggles are the small handles used to control the direction of the parachute. There is one on each side, attached to a suspension line. Pull the right one and you’ll turn right; pull the left one and you’ll turn left. The idea is to use them to turn into the wind and maintain directional control to avoid water, obstacles and power lines.

Landing is inevitable as gravity always wins. Location and manner count. Hopefully, you’ve been able to find an open area and you’re heading into the wind. The best landing position is with your feet and knees held tightly together—with knees slightly bent and toes pointed so one lands on the ball of the feet. Think of these body components as linked shock absorbers. Each will flex, absorbing contact with the ground and lessening the chance of injury. Once on the ground, stand up and run to the downwind side to gather up the chute. If in a desolate area, the canopy can be laid out to signal one’s location or turned into a temporary shelter. The suspension lines can be saved for a variety of uses. When you’re stranded, save everything.

**Buying a Parachute**

All parachutes have a limited lifespan. If you’re interested in buying a used parachute, have a rigger inspect it to ensure it’s within its lifespan. Each parachute has a packing data card that records its history since new. No card—no sale.

A parachute rigger can be a big help when buying a new parachute. This starts with the inspection of the cockpit on your plane. A professional rigger will look at your plane’s seat construction and identify any cockpit snag hazards. Parachutes are constructed in ten sizes. A professional rigger will also suggest a parachute that is appropriate for your size and weight. Parachutes are designed for the weight of the individual who will be wearing it. And a rigger will always suggest one with the proper safety factor. The canopy material of a parachute determines the rate of descent: the more dense fabric, the slower the descent. A buyer also has a selection of latches from which to choose.

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**Care & Maintenance**

The biggest threat to the integrity of a parachute is sun damage. A plane left outside should have a canopy cover. The next recommendation is to allow the pilot’s perspiration to evaporate before storing it. If the fabric doesn’t dry out, the hardware can begin to rust. Federal Aviation Regulations require a parachute to be repacked every 180 days. If more than 180 days has passed since the last inspection and repack, the parachute is not considered airworthy. If the parachute is subjected to any severe conditions (dust, moisture or impact damage) it should be inspected and packed more frequently.★

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The properly fitting parachute should allow the wearer's hands to slide easily under the leg straps and chest strap when standing on the deck. Once seated these gaps will change, but in the standing position is where it's most important as that's the position someone will be in when the chute deploys.

Every parachute, when manufactured, has a tag sewn on the back that gives the part number, serial number and manufacture date. If buying a used parachute, it's important that this tag is still in place. Below the tag is the end of the rip cord, AKA the business end. The round seal is coded to each certified rigger and is added after each packing by that rigger.

The quick ejector snap is optional for both chest and leg straps. While easy to release, it also presents the potential for an unintended release.

The infamous D-ring. Always on the left side of the chest in a velcro pouch. There is enough slack in the cable to allow an accidental removal of the D-ring from its retaining pocket.

Leaving the end of one of the straps loose is an invitation to trouble. It presents a snag hazard when exiting the plane. The elastic loop on each strap is there to gather up the loose ends and stow them neatly.

This is the B-12 snap; it's standard equipment on all parachutes. Easy to latch, but a little difficult to unlatch, which makes it very safe.

The thread-through buckle is an option that can be added to both the chest or leg straps. Its lower profile is more comfortable than the B-12, but takes more time to don the chute as each strap must be properly threaded through its buckle.

The toggle on the suspension line that is used to control the direction of descent. The small red thread is used to keep it in place on the riser and will break once the toggle is pulled.

Another important piece of documentation on each parachute is its record log. In addition to listing the packings, it also clearly spells out the maximum weight of the potential user and maximum speed of deployment.

This is the toggle on the suspension line that is used to control the direction of descent. The small red thread is used to keep it in place on the riser and will break once the toggle is pulled.

The quick ejector snap is optional for both chest and leg straps. While easy to release, it also presents the potential for an unintended release.
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Military trainers like the Yak-52 and Nanchang CJ-6 were designed according to specifications that suited their training mission. Those initial requirements did not include civilian ownership or operation. While a purist would never change more than is absolutely required, most of us in the “Masses” need to make changes to suit our operational style.

The Yak-52 is especially adept as an aerobatic trainer, while the Nanchang CJ-6 fits a broader scope of training requirements. The CJ-6 has more room under the skin to make changes to suit a civilian owner’s needs: long cross-country flights, military Basic Fighter Maneuvers (BFM) and airshow display flying.

When you remove the vacuum tube avionics and heavy cabling, the CJ is suddenly 200lbs lighter. Add a simple baggage compartment, a radio, a transponder, an ELT and the CJ is ready to go. Well, not quite. There still remain a few safety and reliability modifications required to put some reality into the term airworthy.

In this article, I will discuss the kinds of changes that enhance safety and reliability and discuss other popular modifications.

**Safety**

**Exhaust:** While Yaks come with stainless exhaust systems, CJs do not. If there are any original pipes still around, I’m sure they’re on borrowed time. A good exhaust system is absolutely required to prevent hot exhaust gases from burning oil lines and the gascolator. Even with a stainless system, those oil and fuel lines must still be fire-sleeved in case an exhaust pipe breaks or lock rings work loose.

**FOD Barrier:** Every Yak-52 should have a lower FOD barrier in place. Lives have been lost because of wayward items becoming lodged in the empennage controls. A removable metal barrier will last the life of the airframe. GET ONE NOW if you do not already have it.

**Intake Drains:** Safety? Yes, intake elbow drains help remove accumulated oil that could get (or has gotten) into the lower cylinders and cause a hydraulic lock. Perhaps the lock can be “pulled through” and not cause a problem—Perhaps. Perhaps a connecting rod can bend 1/8” out of straight, too. At some point that bent rod is a candidate for in-flight failure. The “book” says to drop the lower cowl, open the drains and remove spark plugs if a hard lock is encountered. Everyday operations seldom encounter such an accumulation of oil, so a single point drain mod was devised to drain off pooled intake oil without dropping the cowl. That works for day-to-day operations but after storage, expect to pull those spark plugs. This is an issue for all radial engines.

**Gearcase Window:** For the Series II M-14P engine, I have created a simple adaptation to position the prop so that the #1 cylinder is at Top Dead Center. In doing so, this pulls the lower pistons to the bottom of their stroke, so that oil from the case does not fill the cylinder and initiate a hydraulic lock. The Russians initially created this window modification; I designed a simple mod kit that’s similar. This mod can also serve to accurately time the magnetos consistently from annual to annual.

**Swaged Brake Cable Ends:** Older CJs came into Western service with soldered ball ends. Those ends often became metal-fatigued and pulled through; meaning loss of braking. Often early brake handles also would snap.

**Reliability**

For civilian use of Yaks and CJs some modifications can enhance system reliability and safety.

**Stainless Water Filter:** While the Nanchang was fitted with an air-water filter, it was made from aluminum and is subject to corrosion. A stainless-steel unit will outlast the airframe. Regular servicing is required. The type of climate and weather in which the aircraft typically operates determines servicing intervals. This will keep damaging moisture out of the pneumatic system where corrosion and clogging will result. In the end, this means fewer operational failures and longer component life. Yaks may also be fitted, enjoying the same benefits.

**Oil Filters:** Spin-on, 10-micron oil filter elements, not merely screens, help to remove carbon flake build-up and wear from silica (dirt). The benefit is less engine wear and longer mean time between overhauls. Aviation oils with Ashless Detergent (AD) additives work best when clean. Beware of using “Plus” oils intended for flat engines,
as these additives scavenge lead deposits. The master rod bearing has an outer layer of lead protecting the silver-plating underneath. Lose that plating and the silver degrades to the point of seizing the engine and sending parts out through the cowl.

**Air Filter**: A quality, Brackett air filter is available for the Nanchang that will keep dirt, sand and vegetation out of the induction system. The filter works in concert with the oil filter to prolong engine life. Yaks can be fitted with flat filters to assist the existing screen.

**Convenience**

**Rudder Pedal Mod**: Longer legs need more room when traveling than Yak or CJ cockpits provide. There are different mods on the market. I now have one that fits the Yak-50, Yak-55, Yak-52 and the CJ-6. Up to three-inches of extra legroom makes a big difference to me when going cross-country. Shorter legged pilots may feel that they do not need it, but what about the passenger in the back seat? Do you want their feet in the way of your rudder pedals?

**Baggage**: The old avionics bay behind the rear seat on the CJ-6 is typically used as a storage area. My advice is to keep it simple and light. A removable floor and shelf with tie downs can do the job. No need for lights, upholstery and panels.

**Air Fill Port**: A Schrader valve and quick, twist-on connect allows fill from a bottle. Use the high-pressure, strut type valve and not the hardware store variety.

**Aux Tanks**: More can be said about larger fuel capacity than I care to address here. Beware of complex vent systems and expensive bladders that require periodic replacement due to wearing of the fabric and small creases that start leaking. My solution was a simple—a removable aluminum tank sitting on the old ADF rack. I found that another 14 gallons was enough to extend range for over-mountain flights and maintain a reserve.

**Rudder Trim**: Cockpit-adjustable rudder trim can help keep the slip-skid ball centered and a balanced fuel burn between tanks. The same principle works for all low-wing aircraft. (Look for an article on adding an adjustable rudder trim in a future issue of *Red Alert*.)

**Popular Mods**

**My Opinions & Advice**

**Props**: For a princely sum, huge, three-blade props mimic the look of a WW-II fighter. However, there are other choices at a good price and with better performance.

**Malcom Hoods**: More headroom is not a bad thing, especially when wearing a flight helmet. But the cost is higher than a standard canopy and an ill fitting one

**Rockets, Guns and Bombs**: Wow! Where did you find all that junk? Realize that the mounts often induce several times more parasitic drag than the device hanging on it. My advice is to attach it after you get to the show.

**Bladder Tanks**: Yes, they hold more fuel, but they are expensive and need replacing at some point. With either a CJ or a Yak, expect the same issues and lifespan that general aviation aircraft experience. I prefer metal or composite tanks.

**After-Market Pistons**: After-market pistons are available with “gapless rings,” they are reported to do what they claim: lower oil consumption. High-compression pistons add horsepower, but they also stress the engine, gears and bearings with extra loads. Expect a shorter time between overhaul and greater susceptibility to hydraulic lock.

**Smoke System**: Smoke ’em if you got ’em. My advice is to use proven components and modest sized smoke oil tanks. Do not re-invent a system that already works.
The Net Effect

Weight: What does it all weigh, including the ballast, to correct for CG changes? The Nanchang Maintenance Manual says 2414lbs (1095kg) empty. After removal of the “stuff” mentioned above, expect an empty weight substantially LESS than that. Even with an M-14P and 51lbs of ballast, my CJ weighed 2,343lbs empty. Here, empty means with unusable fuel and 9 quarts oil.

There are Yaks and CJs out there with more weight than stock. Those pilots accept the degradation in performance and efficiency as a trade-off for the “right stuff” look of a fire-breathing WW-II fighter.

The Next Buyer: Prospective buyers should expect that all of the safety modifications described above have already been installed. They should also expect that reliability mods and some creature comforts have been added as well. As a service to the community, I created a CJ Buyers Guide that’s sold on the RPA website store. I would like to think that it brought new people into the community over the last several years. Now someone needs to do a buyer’s guide for Yaks.

Whirlwind replacement prop blades offer good performance at a price $10,000 less than the big three-bladed props. They also come in carbon fiber and screw into the existing hub.

This is the 24-inch Les Crowder spinner with a Whirlwind reconditioned Russian V530 prop. This spinner is much sought after for the “look” but must be reinforced and occasionally repaired for cracks that develop. Whirlwind reconditioning of the stock paddle blade is great choice to make without breaking the bank.

MT “Focke Wulf 190” prop can be seen on some Red Star airplanes. It’s a beautiful prop but expensive.

CONGRATULATIONS TO THE FOLLOWING RPA MEMBERS WHO HAVE ACHIEVED FORMATION QUALIFICATIONS.

LEAD
Andrew Elliot

WING
Marco Caflisch
Bill Davey
Janet Denton
Patrick Falley
Robert Johnson
Heather Lang

Bret Lowell
Paul Kessel
Christopher Maurer
Gary Pope
Scott Wallace
Mike Weed
Every summer writers warn about the effects of density altitude on aircraft performance; and every year pilots mush off runways into trees and power lines. Why is that? For one thing, density altitude is a non-denominational, equal opportunity killer. It doesn’t matter what kind of airplane you’re flying or what rating you might have.

Conceptually, I think everyone who completes ground school in pursuit of a private pilot certificate understands that with higher altitude or hotter temperature, aircraft performance decreases. But, even some experienced pilots don’t appreciate the significant impact of high temperature and/or high altitude on an aircraft’s ability to fly. In part, the performance degradation is masked in many POH tables—it really doesn’t jump out at you.

A friend of mine who has been a private pilot for some time had his “Aha” moment when he was shown a Koch Chart, which you will find below. To determine the additional runway distance—and corresponding decrease in rate of climb penalty at any given temperature, take a straight edge and line it up with the temperature on the left scale, and with the airport's pressure altitude, as shown below, on the right scale. You may determine airport pressure altitude by setting the Kollsman window at 29.92 and noting the altimeter reading. Next, check the effect on your aircraft performance on the scales in the middle of the chart.

In this example, with a pressure altitude of 6,000 feet (Big Bear’s field elevation is 6,752 feet) and a temperature of 100° F, you will need to increase your standard day normal takeoff distance by at least 200%—and you should expect 75% decrease compared to standard-day climb performance.

After seeing this chart during a Wings seminar, my friend commented that he now understood why he had such a hard time taking off and climbing out from Albuquerque one summer day several years before. To his dismay, he realized he had been an accident waiting to happen for all those years, because he didn’t appreciate the drastic effect higher altitudes and higher temperatures have on every airplane’s performance. My son and I had a similar experience one summer day taking off from a high altitude airport. But, because we were aware of the density altitude, we readily accepted a little crosswind to use a longer runway, rather than the one more aligned with the wind.

You can see from the chart, that rising temperature profoundly affects aircraft performance, specifically takeoff distance. That’s because there are fewer molecules of air going over your wing to generate lift; through your propeller arc to push and generate thrust; and into your engine’s fuel/air mixture to generate power—a triple threat. A good solution: take off early in the morning before it gets hot, if your schedule allows. If not, check your takeoff data carefully; make sure you have plenty of runway available, and use it all. Density altitude is so critical many airports now include it in their ATIS. So, if you’re taking off from an airport with an elevation of 4,000 feet and the ATIS is reporting the density altitude at 7,000 or 8,000 feet, an alarm needs to off in your head: “Did I calculate my takeoff data accurately and with the most current weather information?”

Types of Altitude

Pilots sometimes confuse the term “density altitude” with other definitions of altitude. To review, here are some types of altitude:

- **Indicated Altitude** is the altitude shown on the altimeter.

- **True Altitude** is height above mean sea level (MSL).

- **Absolute Altitude** is height above ground level (AGL).

- **Pressure Altitude** is the indicated altitude when an altimeter is set to 29.92 in Hg (1013 hPa in other parts of the world). It is primarily used in aircraft performance calculations and in high-altitude flight.

- **Density Altitude** is formally defined as “pressure altitude corrected for nonstandard temperature variations.”
I have long believed that the Yak-50 is one of the world’s most charismatic aircraft, but its history has not been well chronicled. In my determination to purchase one, I became involved with an extraordinary range of people, both in the East and in the West. It is a story worth telling, although it does stray somewhat from areas of technicalities and flying.

The Yak-50 was designed in the very early 1970s and had been in test since 1972. It was essentially a redesigned 18 PS but now featured a semi-monocoque fuselage and all-metal wings with fabric-covered control surfaces. And it was smaller, with a 360hp engine. The prototype had fixed main-wheels with large spats and a “teardrop” canopy. The aircraft was clearly going to do well at aerobatics, and a total of 312 aircraft were built between 1973 and 1986. Of course, we here in the West were not aware of them until the 1976 World Aerobatic Championships held in Kiev, then of course in Russia. The Russians inevitably performed well, coming in first and second in the men’s category, and then first to fifth in the women’s.

Western pilots came back marveling at the Yak-50s purely from that lovely low growl but in particular, its size, making the Western Pitts look totally insignificant.

I first competed in 1978 at a World Championship held in Czechoslovakia. When I first saw the Yak-50s, they lived up to everything I’d anticipated. Then we heard that Letsko had been killed following a structural failure during a practice flight in his 50. Igor Egorov, the 1970 world champion and runner-up to Letsko in 1976, took his place on the team.

When I returned to the UK, I explored all avenues that I thought might lead to an aircraft for me: The Yakovlev Design Bureau in Moscow; the Russian Embassy in London; the British Embassy in Moscow; the Russian Trade Delegation in North London. I even contacted the Russian pilots I had met, but without much initial success. Then one day a call came and the voice at the other end of the phone greeted me by saying, “Me Vadim Zedneprovsky, Russian Trade Delegation; you want Yakovlev 50 – I sell you.” Of course I met with him, and indeed he actually did have a sales brochure, in English, for a Yak-50. This gave me the impression that there might be a genuine intention of selling, although historically the Russians had never sold any of their front-line aerobatic aircraft. My new friend Vadim clearly knew nothing about aircraft, but superficially he did seem to think that a deal might be possible.

Much to my surprise, some six months later I opened a newspaper to see a photograph of Vadim being escorted by burly British policemen onto a Tupelev 134 at Heathrow. The caption read, “Russian spy expelled from the UK.” Further below I found more detail of his “activities incompatible with his diplomatic status”! There would be no Yak-50 for me from Vadim.

While my desire for a 50 was undiminished, I couldn’t see much progress take place toward actually acquiring one. Furthermore, for various political reasons, the Russians didn’t participate in the 1980 world Championships. The next time that I came close to a 50 was that the ’82 world Championships in Austria. Although time had passed, I had kept in contact with various members of the Russian team, specifically Victor Smolin and Halide Makagonova. Victor went on to win the championships. Halide came third in the women’s championship, flying the Yak-50 newly equipped with a three-blade, Hoffman propeller. This gave me the opportunity to spend more time with the Russians, and when the championships were over, I was one of a very small handful of Western pilots who were invited to fly the 50. My instructions came from Victor. The briefing, as I sat in the aircraft, consisted of my being shown the undercarriage lever with the clarification: “chassis up-chassis down”. For the Russians, “chassis” indicates undercarriage. So, with that rather brief instruction on the 50 systems, off I went. But, gosh, how different it was from other aircraft I had flown. It was noisy, hot and I couldn’t get over how poorly harmonized the controls were. For example, a very light elevator, moderate rudder pressures and yet very heavy ailerons. Naturally, the Yakovlev Design Bureau overcame, in a limited manner, the aileron issue later with rather ugly wing-tip servos. The basic problem was never really sorted out. However, these issues were relatively minor and I came away from my flight even more eager to own one of these planes.

By the mid-1980s, I had made no further progress on my quest...
for a Yak-50. Through my Russian friends I had heard rumors that due to the structural problems with the very hard-flown 50s of the Russian team, the Russian authorities were putting a lot of pressure on Yakovlev to come up with a new and much stronger aircraft. The result was the Yak-55. The homely but functional new design did well right away in the 1984 World Championships. However, Moscow had initially issued instructions to restrict the flying of Yak-50s in Russia. In early 1986 there were rumors that all 50s were to be scrapped and logbooks returned to Moscow. This was a potential disaster.

Of the 312 aircraft that were built, seven went to Bulgaria and it was becoming impossible to track what happened to them. The only other export market was the DDR (Deutsche Demokratische Republik), the former East Germany. Eight planes were delivered there shortly before the 1980 World Championships, so pilots had no time to practice. After a fatal accident involving one of them they decided to change to the Zlin 50, which had been performing extremely well in the hands of the Czech team. A deal was struck for six of the remaining 50s. They had decided to keep one aircraft for their national museum. So in early 1987, the deal was completed. As soon as I could, I went there and ferried back to the UK the two aircraft that I had agreed to purchase.

Back in the UK, I decided to involve Vic Norman in the project. He’d become a very good friend and was keen on anything that was exciting and had to do with aviation. We thought about sponsorship, since our two planes were the only Yak-50s that would be available. In our opinion, the first privately owned Russian aircraft in the West would be very newsworthy. We considered the various companies and businesses that might be interested, and one name stood out—Vladivar Vodka. This company based in the UK had a rather clever advertising campaign where they pretended to be Russian. They were based in Warrington, and their slogan was something like, “Vladivar—the Vodka from Warrington.” Vladivar was actually owned by a big brewing company called Greenalls, who also made Bombay Sapphire gin and other products. They seemed to us an obvious fit.

Vic and I met their marketing director. We had both enjoyed quite successful sponsorships in the past, so we already knew how present ourselves. Happily, the enthusiasm at Vladivar Vodka was already there, so it was rather like pushing against an open door.

They were great sponsors. They gave us huge amounts of booze and loved the exposure that we gave them. We painted the aircraft in the colors of the Russian team, which we thought was much better than the rather drab, East German version. Interestingly, we were able to obtain West German certificates of registration and airworthiness, so the planes had German registrations. There are of course international rules governing these things such as the requirement that all registration letters applied externally to an aircraft must be in Roman script. We thought it would be amusing to have it in Russian Cyrillic script, and so we did. Amazingly it took UK, CAA almost nine months to spot this flagrant breach of international regulations, but we got a lot of publicity in the meantime!

Naturally, we had no manuals, no tools, no spare parts and, in-
Todd "Banger" Bohlman's Yak-52

Manufacturer: Yakovlev 1985
Engine: M14P
Prop: Whirlwind W530 Composite Whisper Tip™ Scimitar Blades
Avionics: EFIS - Dynon EFIS-D10A, Radio - Garmin 250XL, Transponder - Becker ATC 41
Extras: Smoke system by - Smoke-System-helper.com
Todd "Banger" Bohlman's Yak-52

Manufacturer: Yakovlev

Engine: M 14P

Prop: Whirlwind W5 30 Composite Whisper Tip™ Scimitar Blades

Avionics: EFIS - Dynon EFIS-D10A, Radio - Garmin 250XL, Transponder - Becker ATC 4401-1

Extras: Smoke system by - Smoke-System-helper.com

Photo by: Speedo
If there’s one difference between the warbird community on the East Coast and that on the West Coast, it could be that East Coast flying tends to be more of a “bird of a feather” variety. In other words, it seems that warbird groups on the West Coast fly together more frequently than those on the East Coast. The Great Southern Warbird Fly-In of 2018 was going to change that paradigm. This event, designed to bring the various warbird operators together, was the brainchild of the RPA’s Jon “Saber” Blake and Jim “Zack” Olzacki, President/Commander of EAA Warbird Squadron 24 and Director of Warbirds of America.

In Zack’s initial invitation to warbird operators in the Southeast, he wrote, “The concept is to meet and greet fellow warbird operators and owners from all warbird organizations from across the southern states. Any and all warbirds, whether you belong to a group or not, fly formation or not... it doesn’t matter, come and enjoy.” December 7-9, 2018, was selected as the weekend for the event that took place in Lakeland, Florida.

As Zack and Saber developed their plans, they decided to add the element of fundraising to the event to benefit The Veterans Airlift Command. The VAC provides free air transportation to post-9/11 combat wounded veterans and their families for medical and other compassionate purposes through a national network of volunteer aircraft owners and pilots.

As plans began to take shape, Saber told Red Alert National Correspondent Jay “Ocho” Selman what they had in mind. This got Ocho thinking about adding a new dimension to the event. Ocho says, “For the last two years, I have had the honor of being an official photographer for Sun ’n Fun, giving me a chance to work with some very good aviation photographers. It occurred to me that this might be a perfect opportunity for these photographers to enjoy the thrill of air-to-air photography. In addition, I thought that this could be combined with some professional instruction and serve as another opportunity to raise funds for the Veterans Airlift Command.” José Ramos, an accomplished photographer and a representative for Nikon, was the group’s instructor. Each attendee covered their own expenses and made a donation to the VAC.

In his “State of the Squadron” report to the EAA Warbird Squadron 24, Zack wrote, “The Great Southern Warbird Fly-in was a resounding success in spite of poor weather (Hurricane Michael) reducing our attendance. We had just under thirty Warbirds attend. We originally had RSVPs for almost 60 people which would have resulted in quite a few more Warbirds. The event was intended to draw together Warbird operators and enthusiasts from all Warbird organizations as well as individuals, including Red Stars, T-34s, and NATA to name a few.”

Saber’s report to the RPA leadership reflects a similar opinion. “As Zack stated in his report, the goal was simple... get warbird pilots from all over the Southern States to flock together for one weekend, do a little formation flying, and get to know fellow warbird owners from different groups.”

Not only did Saber and Zack agree that the Great Southern Warbird Fly-in was an unequivocal success, but it looks certain that they will repeat this event in late 2019. Furthermore, they hope that this event can be used as a blueprint for similar events with the participation of warbird pilots from around the country.
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INFORMAL FORMATION CLINIC
Mesa, Arizona

Words & Photos by Jay "Ocho" Selman
Scott “Munchie” Andrews, the RPA’s Southwest Regional Director, has organized the Informal Formation Flying Clinic at Falcon Field, in Mesa, Arizona for the past 11 years. Munchie, who is also a captain for American Airlines, has owned his CJ-6 for 14 years. He says, “Back then, about two dozen Nanchangs and Yaks were in the Phoenix area, and a hangar filled with warbirds was right here at Falcon Field. But nobody was running a formation clinic in Arizona, where it was greatly needed. Some say I stepped up to the plate; others say I got suckered in. Either way, I ran my first clinic in 2008 and it quickly became a rite of spring here in Arizona.”

Munchie’s event has two notable characteristics. First, the event attracts a large number of Leads, Instructors and Check Pilots, thereby ensuring that all “newbies” receive instruction. This year’s clinic saw 19 aircraft and 32 pilots, including seven Leads and three Check Pilots. Second, while some formation clinics are set up to focus on one or two aircraft types, Munchie welcomes all aircraft types, provided the pilot is serious about learning to fly formation. He notes, “There are operational limits, of course. An L-39 pilot might not have another plane in the same speed category. The same holds true for a Stearman. However, we have no trouble matching those pilots with an instructor and working with them on the basics of formation flying. Pilots have a bad habit of judging other pilots by the aircraft they fly, and that simply is not correct. One of our Flight Leads, Andy Elliott, also the...
events Operations Officer, flies an RV-8.”

As with all RPA clinics, this one began with a safety briefing. Andy “Dribble” Elliott presented it along with an extended brief on local airport and airspace procedures. Since Falcon Field is his home airport, he is well-qualified to give this briefing. Elliott also focused his brief on the unique challenges of flying dissimilar aircraft in formation.

Thursday consisted of a preliminary warm-up of two-ship flights, probably the only time during the weekend that birds of a feather flew together. On Friday, training began in earnest with four-ships. The first flight up was a good example of the sort of formations that were flying out of Falcon Field; it consisted of one Nanchang, two RVs, and a Cirrus. The objectives were to have Mike “Gadget” Radomsky working toward a Lead card in his Cirrus and prepare Marco Caflisch for a rec ride and check ride in his RV-8. The afternoon flight was even more diverse, consisting of a CJ-6, RV-8, a Cirrus and a Mooney.

By Saturday morning, there were enough planes and pilots to assemble one flight with three out of four planes creating an “almost similar” flight—two Yak 52s, a CJ-6 and one of the world’s nicest-looking Navions. After spending most of Friday addressing an oil leak, Tim Brown flew number three in his Yak-52 and finally, Dick Stich brought up the rear in his eye-catching Navion, resplendent in the colors of the Air Force Thunderbirds. It was probably the most colorful formation of the day.

The traditional Canyon Run took place on Sunday. This is a beautiful, 6.5-mile morning flight through Arizona’s Superstition Mountains. Seven aircraft participated in trail, at seven-second intervals. It becomes an old school, follow-the-leader flight through one of the most scenic areas in Arizona.

Having now run for 11 years, Munchie’s Informal Formation Flying Clinic at Falcon Field remains one of the premiere formation clinics in the country. There’s no substitute for experience, and that’s one attribute that Munchie brings to the event in abundance.
Soar through the skies with the only shoe designed exclusively for the world’s best pilots. Our patented heel slider provides frictionless movement across floorboards assisting with rudder control, carbon fiber arch support provides enhanced stabilization and dual-density RMF midsole and Ortholite insole keep you comfortable on and off the tarmac.
Newest Item in the RPA Store

Lift Knee Board

Lift’s performance in-flight knee board made from high strength ballistic nylon that includes a FIDLOCK™ buckle system. Features a removable EVA leg pad and an integrated support system for digital tablets up to the size of an iPad mini.

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- Integrated support for digital tablets – Fits up to iPad mini
- Comes standard with included LIFT Aviation acrylic clipboard

The Chinese government has now approved the CJ-6 for civilian use. The CJ-6 is the only Chinese produced aircraft to have been routinely used for pilot candidate selection and training in its domestic aviation schools. Luo Ronghua, general manager of the Aviation Industry Corporation of China, said the approval marked a milestone in China’s development of general aviation through deeper military-civilian integration. Li Jian, deputy director of the Civil Aviation Administration of China, said the administration issued the airworthiness approval to the CJ-6 after considering its long-standing service and safety record as well as huge market demand.⭐

With Oshkosh just around the corner, the RPA’s advance team is getting an early start on setting up its position on high ground there. Lock & Load boys!
Red Alert Wins Prestigious J.D. Power Award

On April 1st, the entire staff of Red Alert was flown, by private jet, to New York where they received a J.D. Power Award in the catagory of Best 40-Page All-Color Magazine Dedicated to the Promotion of Safe Formation Flying in Russian and Chinese Warbirds. Editor Robert "Speedo" Genat accepted the award from guest presenter Oprah Winfrey.

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Jessica Rogers Red Alert's New Ad Manager

Jessica Rogers has been an RPA member for two-years and instrumental in the Music City Mingle in the Nashville area. Balancing the role of being an Aerospace major at Embry Riddle and a dedicated mother to her 12 year old son Wyatt, she still manages to be an active member of the aviation community by serving as a board member for the local Women in Aviation, SE Section Membership Chairman for the Ninety-Nines and EAA. Jessica received her Hp & Complex endorsement in the Nanchang CJ-6 and is currently working on her instrument rating. Jessica aspires to be a commercial pilot as well as an airshow pilot within the warbird community. Jessica can be contacted at: redstarpilotadvertising@gmail.com
The proper term for an airport that doesn’t have a control tower or an airport whose tower is not operating, is a non-towered airport. Calling it an uncontrolled airport ignores the procedures the FAA has established in the Aeronautical Information Manual (AIM) for the orderly flow or traffic into and out of that airport (AIM 4-1-9).

This article was prompted by an accident, in March, at Compton, California, where a T-28 apparently overran and landed on top of a Cessna at this non-towered airport. The investigation is in process and the final details have yet to be determined.

Who’s responsible for controlling the flow of traffic into and out of a non-towered airport? We are! Each pilot using the airport needs to do everything possible to ensure safe and well-coordinated airport traffic flow in the air and on the ground. The procedures are simple and straightforward. When arriving at a non-towered airport pilots need to listen to the ATIS, ASOS or AWOS and start monitoring the common traffic advisory frequency (CTAF) 20 to 15 miles out from the airport to listen to the frequency and get a feel for the activity at the airport. Ten miles from the airport the pilot should make a call in the blind stating position and intentions. This should be followed by calls entering downwind, turning base, turning final and clearing the active runway with taxi intentions. Departures are just as easy. After getting airport information from ATIS or ASOS the pilot needs to make a call on CTAF stating where they are on the airport and which runway they are taxiing to. During run up the pilot should continue to monitor the CTAF to be aware of traffic in the pattern and when ready for takeoff, make sure there is no conflicting traffic on final or base leg. And then announce which runway they are departing on and the direction of turn out. Continue to monitor the CTAF until 10 miles away from the airport. An important thing to remember is that not everyone operating at a non-towered airport may have a radio. Pilots should strive to expand their situational awareness beyond that provided by radio calls. The plane on approach does have priority to land but can defer to those waiting to take off and go around. Finally, the plane on approach has the responsibility to ensure the runway is clear of any other traffic.

Many RedStar activities like to use non-towered airports because of the flexibility afforded in that environment but it is incumbent on all users to be on CTAF and clearly communicate what they are doing. We need to make sure we’re on our A-game when we arrive at or depart from a non-towered airport with a formation of aircraft. Priority goes to traffic in the standard box pattern. Pilots flying straight-in approaches and overhead patterns need to sequence with other traffic in the pattern. The same is true for pilots flying instrument approach procedures to the airport when the VFR pattern is in use.

Some civilian general aviation pilots think we do overhead patterns to hotdog and show off but there are advantages to flying to initial for the break. First, it’s a much more efficient way to get two or four aircraft on the ground and not congest the traffic pattern. Next, when you fly the RedStar recommended 45 degree, 1.5G break and short pattern it will put you inside the conventional box pattern downwind and base legs. As you come off the perch each flight member can check once more for traffic on final. If you do have to extend your downwind for traffic on final, remember to clear for any additional traffic on base. Also, as you come off the perch you get a clear look at the touchdown zone and rest of the runway to again clear your flight path before you land and assure there is no conflicting traffic. Finally, the flight’s not over until you’re in the parking spot and the prop stops spinning. Check 6 and 12.
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It's a well-established fact that cutting back on fat, simple carbohydrates and eating more vegetables all have a positive effect on overall health in general and on cardiac issues in particular. But have you ever thought about brain health? Of all our organ systems, the brain is the most valuable organ when it comes to the safe operation of an aircraft.

The risk of dementia has doubled in the last 25 years. This is partially due to the fact that we are living longer and that dementia risks typically increase with age. There may also be environmental factors contributing to neurodegenerative processes. Can this be arrested or slowed down? Are there non-pharmacological ways of addressing this?

A recent study from the Yong Loo Lin School of Medicine in Singapore demonstrated that eating a daily, half cup of mushrooms could slash the risk of developing mild cognitive impairment in seniors over the age of 60. There were noticeable benefits from just one serving a week as well. There is evidence that a plant-based antioxidant called ergothioneine delays cognitive decline.

Much attention has been given to the Mediterranean Diet in terms of reducing heart disease and stroke. It’s now becoming apparent that the Mediterranean Diet may impact neurodegenerative diseases as well. Alzheimer’s disease is strongly associated with the accumulation in the brain of a protein called cerebral amyloid. This amyloid can be imaged using PET scanners and quantified accurately. Studies in Australia took cognitively healthy seniors and followed the development of amyloid in a control group and in a group on the Mediterranean Diet. The results were impressive. At one year, the Mediterranean Diet group had 20% less amyloid than the control group. At three years, they had 60% less amyloid.

Interestingly, the greatest benefits occurred in a sub group that consumed high quantities of fresh fruit. In mouse models, Vitamin C has been linked to a reduction of amyloid burden. It’s suggested that following a Mediterranean Diet and consuming high quantities of fresh fruit will give a person a few more years of good cognitive function. Also, MRI imaging studies reveal less brain atrophy (shrinking) in participants following the Mediterranean Diet.

The Mediterranean Diet ensures that you receive an abundant source of vitamin A (found in foods from animal sources) as well as pro-vitamin A, carotenoids found in plant pigments (plants). Evidence suggests that these compounds prevent amyloid clumping and amyloid deposition. Olive oil, a monounsaturated omega-9 fatty acid, inhibits the activity of an enzyme (beta-secretase 1) that is involved in the synthesis of amyloid in the brain. Additionally the Mediterranean Diet will shift cholesterol being stored in the “lousy” low-density lipoproteins (LDL) towards the “happy” high-density lipoproteins (HDL). This is great for heart and arteries.

One of the largest population studies to date comes from the Harvard School of Public Health. This study evaluated 27,842 participants working in the health care field (average age 73) in terms of their subjective cognitive function. The findings indicated that individuals who had higher consumption of tomatoes, lettuce, Brussels sprouts, peppers and strawberries were associated with lower odds of poor cognitive function. There were strong associations seen with tomato sauce and orange juice.

The explanation advanced for the results seen is that vitamins A, B, C, and E and carotenoids, flavonoids and polyphenols reduce oxidative stress in the brain and help prevent age-related neurologic dysfunction.

The conclusion we can make is that good, rational eating will preserve our brain function and allow us to fly our aircraft longer. Perhaps we can come up with the RPA Pizza: made with tomatoes, mushrooms, peppers and a glass of OJ. Our mid-life dietary choices will determine our risk for later cognitive declines. Even if you are past “mid-life,” dietary choices will still make a difference. Did I make a case to abort the $100 hamburger and have the $100 healthy Mediterranean Diet lunch? ⭐

Ah, yes. The pizza. A favorite of almost everyone. Typically made with lots of cheese and several types of meats. But the tasty looking one above has no meats or cheeses, yet it looks appetizing. It takes some skill, but a vegetarian pizza can be created without meat or cheese and still taste great.

Chuck "Cowboy" Crinnian MD is the RPA’s Flight Surgeon, Lead Pilot, FAST Lead Representative, ATP, CFI and Senior AME. Please call Chuck if you have any questions regarding the FAA Wings program, safety or medical certification concerns. Office#: 480-451-7676 or go to his website: www.aviationdoc.net

Words by: Chuck "Cowboy" Crinnian
“From what I have been able to feel on the stick, the vibration has significantly diminished or has gone away completely. The engine has a smooth drone, similar to what I’m used to on M-14s.”

- DynaVibe user after prop balancing

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The M14-P is a four-stroke radial air-cooled engine. It has an odd number of cylinders—nine—so that a consistent every-other-piston firing order (1-3-5-7-9-2-4-6-8) can be maintained, providing smooth operation. This firing order is designed to leave a one-piston gap between the piston on its combustion stroke and the piston on compression. The active stroke directly helps compress the next cylinder to fire, making the rotating motion more uniform.
This is one of the cylinders (also called a "Jug") from an M-14P radial engine. The view is of the rear of the cylinder with exhaust port on the right and intake port on the left with the spark plug in between. Multiple fins create lots of surface area for cooling. The flange at the bottom is where the cylinder is bolted to the case.

This is the business end of an M-14P cylinder. The cylinder head's combustion chamber is hemispherically shaped. On the right is the intake valve seat and on the left is the exhaust valve seat. At the six and 12 o'clock position are the spark plug openings also fitted with inserts. At the two o'clock position is the port for air for starting.
The M14-P has a short but rigid crankshaft. All of the connecting rods are attached to the crankshaft's single throw by way of the Master Rod. It's the beefy rod at the top which is for the #4 cylinder.

This is what hydraulic lock does to a connecting rod.

This is a piston for an M14-P engine. It has a flat top and clearance notches for the valves.
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