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**RED ALERT**

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**President’s Message**

Greetings, Comrades! I am still jazzed from the awesome good time I had at Oshkosh 2013. For me it was the best Oshkosh in 11 years. The spectacular week, long, cool, dry, VFR weather made everything we did that much more exciting. My Oshkosh report on page eight of this issue details many of the reasons why this was my best Oshkosh.

AirVenture is still the greatest celebration of all things in general aviation. It is still the greatest, prolonged celebration of all things involving warbirds. From walking the flight line, talking to pilots, participating in seminars, attending Warbirds in Review, visiting the Cavanaugh Display Area, and, of course, flying in the warbird air shows, you can become completely intoxicated with warbirds. Oshkosh is also one of the best ways for the RPA to interact with, and support, Warbirds of America (WOA), and our fellow FAST signatories.

Seven to ten years ago, I remember flying out of Manitowoc with 30-50 airplanes! I remember the really big mass formations. I remember the CJ 50th anniversary mass formation. I remember the move from Manitowoc to Oshkosh. I remember the DC-3 formation flights. I remember the big jump in fuel prices, the boredom that set in with the mass formations, and the steep decline in Oshkosh participation.

Over the last five years, Dave Rothenanger (R10), as the Operations Consultant to the Air Boss, has been working with the four major mass formation signatories (RPA, T-34, T-6, and T-28) to improve the quality of our warbird airshow profiles. Things we have done include a Tuesday morning signatory mission commander (MC) breakfast, a plug-and-play approach to mission planning, direct signatory MC involvement in mission planning, elimination of extended mission durations, creation of more dramatic show openings, the creation of the parade pass, and, this year, the addition of 360s, shorter dog bones, and pitchouts and rejoins at show center. However, we think we can do better. Harold Cannon, WOA President, wants us to do better. He chaired a meeting of the four signatories, the Air Bosses, and FAST representatives. He tasked the group to brainstorm and plan next year’s shows in detail, adding as many of our ideas as possible, to jazz up the show, eliminate dead time between mass formation passes, and make it challenging and fun for the pilots to fly.

He wants this done five to six months prior to Oshkosh. Then, he wants the signatories to send these exciting new plans to our memberships. The goal is to entice more of you to bring your planes to AirVenture and fly in the airshows, especially the end of the week shows on Friday and Saturday. Here are some of the ideas I have:

1. Get some time in the low altitude strafe pattern with pyro for a four or eight-ship.
2. Start the show with a 1000-1500’ AGL, line abreast pass from east to west, perpendicular to the show line with a wall of all four signatory mass formations. All aircraft would be lights on, with smoke. Just prior to show center, the four signatory formations would bomb-burst north and south, into their respective altitude blocks and patterns.
3. Increase the current altitude blocks from 300’ to 500’. This would give more vertical maneuvering capability for each signatory’s mass formation, and individual maneuver flights.
4. Our mass formations visually represent the manner in which the vast number of WWII bomber and fighter aircraft filled the sky. What has always been missing are the dog fights that raged around these formations. To recreate these dog fights and fill the dead time between mass formation passes, the 8000’ long show line is divided into two, 4000’ maneuver boxes located over the crowd, north and south of show center. As the mass formation flies down the show line, the MC drops a two or four-ship into each box. These flights pitch out into extended trail and fly lazy eights, simulating dog fights. When the mass formation gets turned around, the MC directs each flight to depart to the west and rejoin the mass formation in the next dog bone. As the formation flies down the show line, the MC drops off another flight into each maneuver box. Using these alternating flights would keep aircraft constantly overhead the crowd presenting two different looks.
5. Put one of the RPA airshow teams in a low-altitude, holding pattern. The Boss would call them in periodically during know dead time, to do an X number of minutes routine until the next low altitude event. The team would then return to the hold and await the next call-in.
6. Get a 500’ AGL parade pass down the show line, either at the start of or the end of each airshow.

WOA knows we can safely ramp up the quality of our portion of the Warbird Air Show by getting pilots from the signatories involved in the planning both with each other and the air bosses. We told WOA that we could possibly increase the number of aircraft in the mass formations by giving our pilots the airshow plans five to six months in advance. We can’t bring back the days of one dollar per gallon 100LL but, remember, if you hold a commercial rating, EAA will pay for your airshow fuel.

I will keep you informed of our planning progress. My goal is to fly six four-ships in the 2014 AirVenture Friday and Saturday airshows. I hope our show plans can entice you to attend!

As always, train hard, and train often.

Terry “Mags” Slawinski
Editor's Notes

This Fall issue marks the end of the summer flying season. Unfortunately, it hasn’t been without tragedy. We lost a pilot and his passenger out west, in Colorado, when he impacted the terrain while practicing an aerobatic maneuver. We lost Tommy Geoghegan and his passenger, a fellow police officer, when they impacted the ocean off the Atlantic coast, while practicing spins. It’s always troubling, and disorienting, when we lose a friend suddenly, and unexpectedly. Although we feel the pain of loss, we still sometimes disassociate ourselves from thinking that it could ever happen to us. The truth is, we are all one misstep or miscalculation away from a similar fate. Aviation is a discipline so unforgiving of error that we all must constantly work to be on top of our game every time we strap in.

Mike

Red Alert is your magazine and would not exist without your input—your stories and experiences are what bring the magazine alive.

2014 ISSUE DEADLINES

Spring: 25 February
Summer: 25 May

Please submit material to:
Mike Filucci mfilucci@gmail.com

Cover
Craig “Hey Suze” Ekberg with Dan “Dawg” Delane on his six, close up on the tail of the B-25 during the Santa Barbara Veterans Day Fly-Over.

Photo by Robert “Speedo” Genat

Material contained herein is published for examination and evaluation of the reader. The Red Star Pilots Association has made no attempt to verify any of the contents and accepts no responsibility for any items printed in this publication. Articles written and published in this magazine are for entertainment only and are the opinion of the author(s). They are not intended to be instructional in nature nor promote deviation from a published flight procedure in any aircraft or technical flight manual, FAR, law or other regulation. The contents are not intended to be construed as offering legal advice or counsel.
For the second year in a row, it is my honor, and pleasure, to recognize and thank our very generous RPA donors.

As a 501(c)3 charitable organization, our volunteers invest TIME and MONEY to increase the membership’s bang for the buck. Both are precious commodities. Both are greatly appreciated. We all invest a lot of personal time and money enjoying our chosen level of RedStar aviation. Through personal philanthropy, our donors have taken their passion for, and vision of what the RPA is, and can be, to a higher level. Again, this year, we will use two Donor Reports to recognize our donors’ generosity.

The first report is the 2013 Report. It lists levels of annual donation using a $250 increment to define each level. One through eight red stars symbolically represent these levels.

The second report is the Life Time Report. This list consists of five levels of donation and is cumulative over the life of the donor. These levels use a $1000 increment to define each level. One to five Red Stars with Wings represent these levels.

Personally and on behalf of the RPA, I thank each of our donors for their very generous contributions to our association.

Terry “Mags” Slawinski

### 2013 Honorable Donors

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“It’s a good thing there are 2 of us up here.” Many times I have said this to my First Officer. When very good people work together as a team, they are exponentially much better at achieving their goal. In 2013, the RPA had an outstanding year at our many clinics, fly ins, and air shows. The volunteers listed below put in countless hours organizing, running, and supporting these events. Their dedicated efforts significantly contributed to the success and professionalism of the RPA. Personally, and on behalf of the RPA, Thank You and Well Done!

Terry “Mags” Slawinski
Clear skies, calm winds, highly skilled pilots, and extraordinary resources combined to make this event one that will be hard to top, and one that will remain in our memories for a long time. “Serious Fun” and “Culture of Excellence” are phrases that capture the goals and mindset of the RedStar Pilots Association. Desert Thunder is the embodiment of both.

Desert Thunder is not for everyone. Minimum qualifications, as well as performance criteria for pilots and aircraft, have been established in order to ensure safety. The capacity of the event is resource limited. Red Air on station time, and helicopter loiter times, are chief among these. Also to be considered is the impact upon the Forward Air Control ground personnel, who must be on station in less than hospitable conditions. Those who attended were the best of the best, and they all came prepared to learn, and prepared to compete.

The opportunity to participate is extended to as many as possible. For those new to this environment there are numerous opportunities to fly back seat with experienced pilots and there are IPs who can fly with those who are ready to perfect and test their skills in this task saturated environment. The goal is to preserve, perfect, and pass these essential skill sets onto the next generation of pilots. This year, the look-out, threat detection, defensive maneuvering, and mutual support were extraordinary. Our comm. still needs work. As observed from the ground, our F.A.C., LTCOL. John C. Allee, U.S.M.C., has said it best, “….you honed your terrain association, search pattern coordination, precision aircraft handling and air-to-ground skills.....should you ever find yourself volunteering for a CAP or SAR flight, you will be better for it.”

Most participants arrived Thursday afternoon. After securing aircraft, establishing fuel accounts, and getting oriented, many went on to the hotel to prepare for the evening briefs. However, many took advantage of the opportunity to get an extra practice hop, and an area familiarization. This is an indicator of the increased com-
petitiveness amongst the group. Another indicator is the increase in advance preparation taking place at home bases prior to the event. Many of the groups from the Bay Area, the L.A. basin, Phoenix, or San Diego had practiced the skill sets together prior to the event. The desert rats from Palmdale had even conducted a mini event one week prior. The result of this was readily apparent. The proficiency level, across the board, was noticeably better. Whether it be the contact navigation, the recce skills, look-out, the mutual support, defensive maneuvering, comm., F.A.C. procedures, precision aircraft handling, or air-to-ground delivery, everyone had their game on.

Thursday evening after Happy Hour, the group assembled for the admin brief and Mike “Beav” Carter’s compelling Tacform and Defensive Maneuver briefing. “Beav’s” professionalism and briefing skills acquired at the U.S.A.F. Fighter Weapons School are readily apparent. Whether it was the first time, or the 20th time you have sat in on one of his briefs, you will leave having learned something new and having been focused upon the task at hand. The group then adjourned to the Sandbar where new friendships were formed and old friendships rekindled. It is this camaraderie that makes the RPA events so memorable. It took some much longer than others to accomplish their social goals. Our senior statesman “Blitz” Fox was observed having great difficulty navigating back to the hotel. Apparently a two lane driveway was not nearly sufficient to contain this human pinball who was clearly “gyro out.” With the help of two staff ladies, he found his way back to the hotel.

Friday morning dawned with dazzling clear skies, and eager anticipation. After the morning admin and safety brief from our Ops Officer, Duke Molter, it was time to turn our attention to air-to-ground procedures. Did I mention the incredible resources and the talent pool available at this event? Our Forward Air Controller and scenario creator, LTCOL John C. Allee, “MO,” took center stage. “MO” is a former USMC F-18 pilot, Navy Test Pilot School graduate/instructor, U.S. Navy Fighter Weapons School graduate and he trained the Forward Air Controllers in Iraq. Using his unique background and qualifications, “MO” spoon fed us all of the procedures necessary to work effectively in the task saturated, Close Air Support environment. Like “Beav,” “MO” has credentials and briefing skills that provide him with unquestioned authority.

The morning flight schedule included Tacform, and an opposed practice route, for those wanting the practice. Some took to the air to conduct their own training. The Air Boss, Gil “NAFOD” Lipaz, ran the schedule board with an iron hand, matching resources with needs and assigning dedicated practice blocs, and working frequencies. The goal is to level the playing field, by providing the best training possible, in a safe, structured environment, for every participant. During the lunch hour, our F.A.C., LTCOL Allee, briefed the afternoon practice air-to-ground mission. T.O.Ts were assigned for entry into the Kill Box, and each element was provided the opportunity to work with the F.A.C., and make practice drops. Smiles and frowns were intermingled as the crews returned to base. This may be fun but it’s not easy.

As the sun dropped behind the mountains to the west, the desert air was still, and the full moon rose in the east. The traditional BBQ on the ramp was preceded by an animated Happy Hour. As has become a part of Desert Thunder, the BBQ is followed by what is, hopefully, an entertaining and informative presentation that is relevant to this event. This year it was the evolution of air-to-air tactics. They have evolved over the years and much has changed, but much has remained the same. As the Red Baron said more than a century ago, “Only the spirit of attack borne of a brave heart can bring success to any fighter aircraft no matter how highly developed it may be.” Aerial tactics have been shaped by technology, training, and geo-politics. Doug “Smooth” Matthews, a former Naval
Aviator, is both an accomplished student of history, and a wonderful steward of history (he owns and flies a P-51 Mustang, an F-4U Corsair, a T-33, an F-86, a T-6, and has other projects in the pipeline) covered the period from WW I to Korea. Darrell “Condor” Gary covered the transitional period from the guns only jets to the high performance missile platforms. This was a period of failed policy and a return to the lessons learned by prior generations of Fighter Pilots—lessons paid for in blood. During this period, the trajectory of tactical aviation was redirected and from it emerged the 4th and 5th generation fighters. Mike “Beav” Carter, using his background at the U.S.A.F. Fighter Weapons School and his experience as an operational test pilot, covered the air frame and technology platforms of the 4th and 5th generation fighters, and how tactics have adapted to this new environment.

At 0730 on Saturday morning, everyone assembled for the scenario brief. “Condor” provided the overview, “MADDAWG” covered safety and area restrictions, “Beav” covered the R.O.E. for Red Air engagements and grading and, finally, “MO” provided a Power Point briefing of the scenario. This year, the scenario had added complexity. Each element would navigate the assigned course, and be graded on accuracy/timing. Each would be required to recce an assigned point on the route and obtain as much detailed information as possible. Each would be confronted by four Red Air bandits at different points on the course. Each would be graded by Red Air on their response—comm./lookout/threat reaction, and mutual support. Once in the Kill Box, they would shift to F.A.C. frequency, and Red Air was no longer a threat.

Once each element checked in with the F.A.C., they would be assigned a hold point. When the F.A.C. was ready for them, they would be given the six-line, and would read it back for confirmation. From there, they would be directed to an IP, and ingress to the target area. Under close control of the F.A.C., each element would be talked onto the target, and cleared in “Hot.”

After two passes at the target, they would be directed to a rendezvous point to locate the helicopter and escort it to the pick-up point for a downed survivor. Once again, each element would be graded on their comm./coordination/accuracy, and overall execution of the air-to-ground portion of the mission. Task saturation is the appropriate description, but this year thanks to preparation, the “helmet fires” were minimal.

The Bone was awarded to John “Lost” Long, and his wingman Kurt “IT” Howerton, who committed an act demonstrating unprecedented absence of situational awareness. While on the opposed course, the element reacted to a suspected Bandit, and in the process lost element integrity, mutual support, sight of the Bandit and sight of each other and sustained a complete loss of situational awareness. In the confused moments that followed, there was a breakdown in communications and the call was made to “pop smoke” in the hope of regaining visual. As can be imagined, this is not recommended procedure in a highly-contested, Bandit-controlled environment. Not only did Lead’s smoke attract his wayward wingman, but every Bandit in the northern hemisphere was now inbound. “Magnet” or “Bait” flight, as they will become known, were unanimously awarded the “Bone” by
Jeffery Ying brought his former French military Gazell helicopter to Desert Thunder. It’s role was to be directed by each participating team into a specific LZ by verbal commands only as the team circled overhead.

LTCOL “Mohamed” Allee once again created a real life FAC scenario by directing the teams into the target area. He then popped red smoke to signal the LZ for the helo.

CALL SIGNS

A call sign review board was convened at Desert Thunder. After extensive comment, the following callsigns were awarded by popular acclaim:

Rich Laughlin - Maxi
Ryder Adams - Notso
Chris Martindell - Bumper
Dee Grimm - Reaper
Todd Bohlman - Banger
Julie Sims - Ginger
Craig Ekberg - Dick *

(*)The senior callsign Imam, Ace Ellinwood, subsequently issued a Fatwa declaring the nomination to change Craig’s call sign to be invalid on a procedural issue.

No event like this can happen without dedicated people. Rachelle “Grins” Gary and Amanda “Animal” Walthour worked tirelessly before, during and after the event doing all of the things that no one else wants to do in order the ensure the success of Desert Thunder and to ensure that the participants are supported and are able to enjoy this time. Doug “Smooth” Matthews provides the iconic Red Air aircraft along with the pilots to fly them and the fuel to run them. Additionally, his knowledge of aircraft and history combined with his sense of humor ensure that Desert Thunder is an event that stands out in our memory. LTCOL John “MO” Allee USMC

their peers.
The final award, given by the ladies of the staff, the “Princess” award, went to Mike “Beav” Carter for unmentionable acts of self-indulgence (asking someone to close his oil drain valve while comfortably seated in his aircraft and claiming a “rough engine” prior to take off—the primer was still on). Finally, the “Night Crawler” award was given by unanimous acclaim, to Byron “Blitz” Fox, for sustained buffoonery throughout the course of the event, not to mention the fact that as a very senior citizen he can still hang…..or not.
and Mike “Beav” Carter bring expertise briefing skills and credibility that provides participants with an experience that can be found nowhere else. The generosity of Jeffrey Ying who provided the Gazelle helicopter, pilots and fuel to operate it brought a new dynamic to this event. Our Ops Officer Duke “MADDAWG” Molter and our Air Boss Gil Lipaz were responsible for safety as well as the implementation of the operational plan and flight schedule coordination. Our unsung hero Ron “LW” Lee collects the funds pays the bills and provides final accounting to ensure the proper use of funds. None of these are not easy tasks in this environment. Our sponsors Warbird LLC, Classic Fighters, Jeffrey Ying, Tiger Squadron and Red Eagles provided direct funding that greatly reduced the cost of the event and ensured that access was provided to many for whom the cost may limit their involvement.

As event organizer, I am truly blessed to have access to the resources that make Desert Thunder so unique. The aircraft, the financial support, the venue, the volunteers, the incredible talent pool all combine to make this the most anticipated one of a kind event on the flying calendar. In the end however it is all about the people. I am fortunate to be able to share experiences and the love of flying with such a wonderful group.

Above: Rachelle “Grins” Gary and her father Darrell “Condor” Gary enjoy a cocktail after another long day at Desert Thunder. Each year Condor has improved the event, testing aircrew’s ability to navigate, avoid air threats, and accurately bomb the target. This year Grins pitched in by building a website specifically for the event, and then working tirelessly everyday to ensure everything came off smoothly.

Right: The Red Air pilots brief their tactics for Saturday’s flights using the fighter pilots built in aircraft simulators. From the left—CJ pilot, Mike “Beav” Carter; Mustang pilot, Doug “Smooth” Matthews; Wildcat pilot, Mike Poley and Corsair pilot Mike Pfleger.

The Mentor Flight of Todd “Judy” McCutcheon and Kevin “Drag” Carson showed superior airmanship in the air-to-ground portion of the event.

The Frito Flight of Dan “Frito” Friedt and Skip “Ranger” Slyfield took the air-to-air honors by using their exceptional skills to repeatedly frustrate and foil the Red Air team.
How I Grew Up To Be A

By Jeff “Linedog” Linebaugh jefflinebaugh@gmail.com

‘Chang to ‘Stang—One Lucky Member’s Journey

Red Alert asked long-time member Jeff Linebaugh to describe his experience moving from his CJ-6 to flying the Commemorative Air Force’s P-51 “Gunfighter.”

How did you get your start in the RPA?

Actually, I first joined the Yak Pilot’s Association (Pre-RPA), when I bought my CJ6, in 1999. It was my first airplane and, as a bare-bones CJ, it was a big undertaking. Joining this group was a huge help in acquiring the knowledge to safely fly and maintain my CJ. With the tutelage of my “CJ Dad”, Pappy Goolsby, we worked to turn our CJ into an airplane to be proud of. After fresh paint, canopies, and an M14P conversion, the CJ really was a great machine. The best part of owning it though was getting to know other owners, sharing knowledge, and getting back into formation flying. The camaraderie in the RPA is unmatched, and has brought life-long friends and dreams realized.

But you sold your CJ?

Yes…Flying WWII warbirds has always been my dream. After a move to Memphis, I got the chance to help work on a Hawker Sea Fury and T-6, and met Dr. Morris Ray. After hearing my desire to fly warbirds, Morris gave me the opportunity to check out in T-6s and Tora-Replicas, and met Dr. Morris Ray. After hearing my desire to move to Memphis, I got the chance to help work on a Hawker Sea Fury. Yes…Flying WWII warbirds has always been my dream. After a move to Memphis, I got the chance to help work on a Hawker Sea Fury and T-6, and met Dr. Morris Ray. After hearing my desire to fly warbirds, Morris gave me the opportunity to check out in Fury and T-6, and met Dr. Morris Ray. After hearing my desire to move to Memphis, I got the chance to help work on a Hawker Sea Fury. Yes…Flying WWII warbirds has always been my dream. After a move to Memphis, I got the chance to help work on a Hawker Sea Fury and T-6, and met Dr. Morris Ray. After hearing my desire to fly warbirds, Morris gave me the opportunity to check out in Fury and T-6, and met Dr. Morris Ray. After hearing my desire to move to Memphis, I got the chance to help work on a Hawker Sea Fury.

Tell us about checking out in the Mustang?

That first flight was unforgettable…I couldn’t bear the thought of tearing up such a precious piece of history! I’d ridden in the jumpseat of Gunfighter several times, but without having a back-seat stick, the first flight is the first time at the controls. The T-6 flies similar to most of the WWII fighters, and is actually more of a handful on the runway than most. After two separate back-seat T-6 checkrides I was deemed ready. Nothing prepares you for that first takeoff though. Pushing the throttle up to 50” really sets you back in the seat, and keeping it straight demands your full attention. Once airborne, the Mustang is stable yet responsive, but very demanding of trim. Fortunately, Lumpy and another Gunfighter pilot, Doug Rozendaal chased me for my first flight. We worked through steep turns, stalls and slow flight, a practice go-around, and even an aileron roll before returning to the pattern. By the end of the first hour, and a hand full of landings, I felt like I might just make it as a Mustang driver.

How does the Mustang compare to the CJ?

The Mustang is not hard to fly. Takeoffs and landings are demanding, but it’s hard to have a big ego flying it when you think of all the newly minted 19 year-old pilots who fought for their lives in the airplane. The CJ provided great training for the takeoff, in that you are rudder limited adding power. Takeoff starts with lots of right rudder, but by the end of the runway (going 150 knots), you are hard on the left rudder until you can relieve the trim pressure. The controls are not much different than the CJ. Roll rate is comparable, as are the stick forces. (Yak 52 drivers would be disappointed in the roll rate.) Elevator forces are high, especially at higher speeds. Trimming is essential, and even small airspeed or power changes require attention in all three axes. Stalls are easy, as long as you are coordinated! What is amazing about the Mustang is how quickly it accelerates, and
how long it maintains momentum. Huge wingovers are a blast, as the airplane seems to be suspended on the wing forever. Formation? The airplane is rock solid, and with lots of power and flaps for drag (that can go out as high as 340 knots), it’s easy to fix mistakes. You haven’t lived until you fly in a 4-ship of Mustangs. Landings are much easier than the T-6, with wheel landings the norm. Visibility is not any worse than the CJ or the -52, until the tailwheel comes down. Go-arounds when slow and fully configured with 50 degrees of flaps can be a handful, and have bitten a bunch of guys.

Give us some interesting numbers pertaining to the Mustang?
Over 15,000 Mustangs were built, but only about 150 remain flying. VNE is 440 KIAS. Low cruise power setting is 30°/2300 RPM burning almost exactly 1 gallon/minute to go 220 KTAS. At high power, the coolant system flows nearly 3 gallons of coolant per second. The airplane is expensive to operate: engine overhauls run about $160,000 (1000 hr. TBO). Prop blades run about $25,000 per blade, if you can find them. Insurance is about $25,000/year. The going rate for a ride is $1995 for a half hour, and at that rate we barely break even. Gunfighter usually flies about 100 hours/year to fly 100 lucky riders.

What special experiences have you had with Gunfighter?
I feel unbelievably fortunate to get to fly the Mustang; every flight is still amazing. Some of the most special flights have been getting to take RPA friends for a ride. Getting to share the airplane with pilots is always a joy, as is flying Wounded Warriors, but nothing compares to meeting WWII vets who flew the Mustang. Seeing the look on their faces as they go back in time to when they flew the airplane, and listening to their experiences is priceless. To me, the P-51 is a tribute to what that generation accomplished. It represents the epitome of the might of the American people and the Greatest Generation. That the P-51 rolled out of the factory just 102 days after the contract was signed still amazes me. We need reminders of stories like this to fuel our next generation. To be involved with such a noble cause, and be associated with people that share that goal is the fulfillment of a life-long dream. Getting to fly such an amazing piece of aviation history is just icing on the cake. I am deeply appreciative of this opportunity that started with the RPA, and the terrific mentors and comrades I met through the group.

I’d been following the Confederate Air Force since my student naval aviator days in South Texas in the 80’s. The 1980’s. I remember how exciting it was to go to the Harlingen Air Show and see flying BF-109’s, Spitfires, Mustangs, Corsairs and the Tora Tora Tora team perform, followed by the gloriously Politically Incorrect re-enactment of the bombing of Hiroshima by the B-29 “Fifi.” Gas was so much cheaper then and they blew up gallons of it. One memorable show I got to meet and talk with Adolf Galland, Stanford Tuck, Pappy Boyington, George Gay and Bob Hoover who were all together on a tour. Fast forward to four years ago and the opportunity to join the CAF (now re-named ‘Commemerative’ as it was too difficult to get the Tuskegee Airman to wear the Confederate battleflag on their flight suits) as a flying Colonel came when the Utah Wing moved the museum to my home field at Heber City, Utah. The Wing aircraft consisted of a C-45 (Beech 18), a Boeing Stearman with a 450 HP motor and a privately owned Harpoon PV-1 bomber. Subsequently another Stearman and an SNJ has been added. I paid $1500.00 into the maintenance and operation fund for the Stearman and began flight training checkout. Because I had more than 500 hours of tailwheel time (which is critical to fly most CAF aircraft) it was a fairly straight forward affair. You pay for your own gas for checkouts and proficiency flying. The other costs are the annual $200.00 dues as a Colonel (I finally made 0-5, although in the fine tradition of the British Army I had to buy my commission) and $500.00 a year for insurance. These rates vary as to which aircraft you end up flying. At the Utah Wing we’re pretty relaxed and the aircraft is usually available most days to take out for .5 proficiency flight and bounces. This year with the dearth of airshows we haven’t taken the aircraft or our PX to many destinations, and have suffered financially because of it. I’ve flown about 10 revenue rides this year which run from 20-30 minutes and several parade flyovers.

The museum is open most weekends and we’ve had several Open Houses, Hangar dances, work party Barbecues and such, and the Boy Scouts come out regularly to camp and earn their aviation merit badges. But the real payoff is when the WWII Vets come out for a ride, or to just be around the aircraft and equipment that were such an important part of their lives. It’s a transformation to see the years fall away, and sometimes the pain of lost friends shine in their eyes. Most of the summer weekends find the doors open and a group of pilots flying, socializing, working on airplanes and mopping up the inevitable puddles of oil that seem to materialize everywhere. The downside is that money is always in short supply and much of the membership is aging and beginning to fall away. Our Wing, and most others I’d imagine, are always on the lookout to recruit younger pilots and members. We’ve been lucky to get four new young pilots who aren’t grizzled old fossils like me. It gives me hope.

My ultimate goal is to get my Fighter checkout and start flying the Rocky Mountain Wing’s TBM Avenger. It’s a special goal for me as that is the aircraft that my Dad started out in as a gunner in WWII. I hope to honor his memory by flying and exhibiting it all over the Mountain West. Of course what I really want is to grow up and be Jeff Linebaugh!

—Skip "Ranger" Slyfield
There once was a flyboy named Charlie
His plane was big, blue, and gnarly
The chickens were scared
And Charlie, unprepared,
Dropped fowl as far as the highway

The skies over Easton, MD came alive one Saturday in late September as dozens of aircraft took to the air for the now world famous 2013 Chicken Drop event. Instigated and well organized by RPA member Steve “Mozam” Dalton in cahoots with Jim Meadows (and many others volunteered by them), this year’s Chicken Drop may be the greatest bombardment of bouncing fowl in history.

Early arrivals gathered at Chili’s on Thursday night to tell lies and plot bombing strategies. The assembled pilots awoke to mostly clear skies on Friday morning and formation training flights launched toward designated practice areas near KESN. While a few aircraft were delayed due to low ceilings to the north, by mid-afternoon the fleet numbered more than twenty aircraft from CT, VA, NC, PA and MD.

From an aircraft type standpoint, this year’s event was one of the most diverse with Yaks, CJ’s, RV’s, T-6’s, T-28’s, T-34’s. In the category of aircraft with wings that fold up on purpose, Charlie Lynch and family presented their spectacular and imposing Grumman TBM Avenger. This historic airplane is a real crowd pleaser that looks great, sounds great and does yoga at the pull of a lever. Or is it a push of the lever?

On Friday evening the reception and dinner at Mason’s restaurant was well attended by pilots, bombardiers and many supporters. As the evening wore on, the trajectory lessons, bragging, side bets, scheming and other psychological warfare began in earnest. The only quiet ones were the chickens themselves who had been confined to their quarters in the hangar.

Saturday morning was mostly clear with a scattered clouds as hundreds of local citizens turned out for Easton Airport Day.

The morning’s activities included a hot air balloon launch, P-51 flyby and “Jet Pull” contest involving rope attached to a Lockheed F-104 Starfighter. Sponsor contributions and a portion of proceeds from the sale of food and souvenirs would later be donated to Habitat for Humanity.

The Chicken Drop is the featured event of Easton Airport Day. Mozam began the mass formation briefing at 1100 with all hands on deck. While pleasing to spectators, aircraft dissimilarity complicates mission planning. The largest aircraft in the mass formation, the T-6 Texan, is nearly three times heavier than the RV’s in the adjacent flights, so extra care must be taken to ensure flight safety. In addition KESN is a towered airport near the Washington DC ADIZ that remains operational during the event. Hence the briefing included key members of the excellent and very cooperative KESN air traffic control team. The briefing began and proceeded flawlessly for about 60 seconds until Mozam’s high definition powerpoint graphics were unveiled. Consisting of light grey stick figure airplanes on a white background, Mozam claims he had composed this masterpiece using his index finger and an iPad while flying a 737. Some say he may have been blindfolded. Luckily and with help from some friends, Mozam was able to activate the emergency backup system (a flipchart and marker) which served well enough.

After the briefing, the target was marked (the airport manager’s pickup truck), the chickens and bombardiers received final instructions. Twenty three engines started at precisely 1200 hrs, then four flights of four and one flight of six took departed to join up over the field for the mass formation sequence. Being too fast for the rest of us, the big TBM Avenger and two T-28 Trojans launched separately, laboring skyward at full power under the weight of their clucking ordinance.

The mass formation maneuvers went off perfectly with several
passes over the field in various configurations. The diamond formations looked particularly good as the number four ships tucked close in the slot as briefed. In the final upwind pass, the flights approached the field in echelon, one by one pitching out into a long descending racetrack pattern back into the upwind bombing run.

The first ship over the target was piloted by Mozam, who took advantage of the free smoke oil by blanketing the target while his bombardier/bride Kibby took her best shot. As our readers may know, Yaks are not generally equipped with FLIR and radar altimeters, hence the rest of Mozam flight did the best they could through the thick fog. In a significant turn of events, the smoke had cleared by the time the T-34's came through.

In spite of rigorous selection and training there were a few misfires and many casualties amongst the rubber chickens. For a few harrowing seconds one chicken snagged a radio antenna briefly before skillfully breaking free and completing its important mission. After the last of the “light” bombers had made their pass, the Trojans and Avenger approached fast and low. As the Avenger passed over the target, the expectant crowd cheered but nothing happened until a few seconds and ½ mile later when the bomb bay doors opened, letting loose a stream of rubber chickens in numbers only Colonel Sanders could comprehend.

While many fared poorly, no chicken injuries could be attributed to contact with the target itself. The few that came to rest anywhere within the 450 acre airfield perimeter are expected to bounce back and fly again next year. Vast numbers of other chickens, mostly from one source, are missing and presumed captured by local residents.

The landing proceeded uneventfully but scandal erupted during the de-briefing. Randy “Bear” Devere was initially reported as the winner with a direct hit. Then, just as the applause began and Bear rose to his feet with a triumphant grin, there was a shocking announcement: officials were rescinding Bear’s victory. A grim silence fell over the crowd as reports surfaced that the chicken ejected from Bear’s CJ was in fact a stunt double while the real rubber chicken had stowed away in the target vehicle’s glovebox. Later, a senior RPA official (who declined to be quoted for this article) said Bear will be brought up on charges of fowl play, given a fair trial and then found either guilty or guiltier. The sentence is expected to involve a potent beverage.

As the crowd settled down after the stowaway scandal, the actual winner was announced. T-34 Mentor pilot Charlie Robertson and his bombardier had placed their chicken just a few feet from the target, thereby claiming their rightful place in the annals of rubber chickens. The crowd applauded, especially the T-34 pilots. The RPA pilots would later discover, Robertson’s victory was just the beginning of an evil T-34 master plan.

Later in the day, the weather was clear and warm as the RPA pilots enjoyed an evening cruise from St. Michaels through various waterways surrounding the Chesapeake Bay. With the sun setting and after the first or second trip to the open bar, a distant but unmistakable drone could be heard. Then, low on the horizon a flight of six T-34’s could be seen approaching the cruise boat head on. In a near perfect (for T-34 drivers) formation, they crossed directly overhead in two passes. The innocent and defenseless RPA pilots then watched as the aggressors carved a wide arc into extended trail, one following the other in low passes with landing lights blazing. After the ship’s captain was persuaded to resume a standing position in the wheelhouse, the rest of the cruise proceeded uneventfully.
All in all, 2013 Chicken Drop was the greatest yet. The weather, logistics and amenities were outstanding. Much valuable knowledge was exchanged through formation training exercises and, in some cases, proven in checkrides. More knowledge was exchanged between sorties and during social events as aircraft operating and maintenance topics were debated. The flying spirit and camaraderie that comes with sharing challenges was evident throughout and the event was entertaining for many more than just the flight crews. Moreover, we helped raise money for charity and most importantly, everybody stayed safe.

As the months tick away between now and the 2014 Chicken Drop, we trust the Avenger pilots will practice lever pulling (or was it pushing?) while the rest of the Northeast region RPA pilots plot their revenge against the T-34’s ...stay tuned! ★
Near a little town on the Chesapeake, a two-lane highway crosses level farmland towards an airfield and its half dozen vast steel barns, each suspending five stories of shadowy emptiness above an acre of concrete floor. The high hangar doors are narrowly open, and when you step sideways through them from morning sun you blink in indoor twilight. To one side a burly man in a flight suit gazes disapprovingly at a plane with its cowling off. Over in the corner sits a small jet in a state of meticulous deconstruction, its inwards arranged and labeled on adjacent shelves.

In the back of the hangar a dozen rummage-sale type folding tables are set up, and here the Red Star pilots will shortly settle with coffee in paper cups to scour the weather forecasts and plan the day’s formation flights. Within an hour, they’ll be flying wingtip to wingtip at 130 miles an hour a mile above this field. What for, is what I’ve come here to find out. My brother is one of the pilots. I’ve known him all my life and I’ve never gotten past a sense of awe and eye-rolling mystification that he does this. I mean, middle-aged men are understood to be partial to Harleys and Corvettes. But this pastime looks to me like a gnarly mix of military discipline, temperamental machinery, and suicidal tendencies. As a sister to two brothers, mother to two sons, I’m stumped by the imperatives of testosterone.

My brother has invited me to fly with him as bombardier for the Red Star pilots’ annual Rubber Chicken Drop, and today I have to pony up or chicken out. I’m still debating which one as I swing up over the wing and get into the back seat of his Yak-52. It’s a small bruiser of a plane painted in bad ass black and red. Its big nose is busting with engine that sounds like a cross between an old Dodge and a twin-screw trawler. It sounds like it will go 1000 miles an hour. It heaves smoke out like it means business.

My brother shows me how to do up the parachute harness and the five seat belts that will hold me in no matter which direction gravity is pulling. He shows me how to open my canopy for fresh air or to get out. There’s a small red “Eject” button on the dashboard. It’s held on with tape, right beside the green button that says “Panic.” Pilot humor. I get the headset on, so we’ll be able to talk. Not that I intend to chat. I don’t want to distract him from flying this thing.

Twenty-two planes go up, divided into flights of three and four. Our flight is four shiny military two-seaters built to take a beating. Taking off seconds apart, we come together in a diamond formation before we’re out of sight of the airstrip. My brother is flying in the #4 position, furthest from the lead and at the end of the whip. Known as “the slot” it’s generally regarded as the trickiest to fly. The space between wing-tips is no more than the width and height of a suburban garage—and when turbulence jostles us those gaps seem mighty tight. Sky is all around. Far below, and off to the horizon, lie green and gold patches of farm, slashed and carved by the dark inlets of the Chesapeake.

I expect to be scared but that doesn’t happen. As the flight begins its formation patterns I realize we are performing ballet a mile above Maryland’s Saturday shoppers and soccer players. One at a time, each plane banks into a wide turn, pivots on a wingtip and rejoins the diamond. Over the headset I hear my brother say, “Okay, here comes the break.” And then, “Remember to breathe through the G’s.” Next we climb and swoop in “extended trail” formation—we are playing follow-the-leader. My brother calls this “roller-coaster stuff.” I like feeling snugly strapped in as gravity squeezes and releases us. This is performance art built out of daredevily and roaring engines. But my idea about a testosterone sport is falling apart—the aerial skills up here are subordinated to art. These pilots entrust their lives to each other to create transitory moments of beauty. Later my brother tells me I’ve got the wrong hormones—it’s all about dopamines, he says.

Below us, a V of geese appears and vanishes to the south in a split second. I’m looking at the back of my brother’s head, and I can feel his total concentration. He does not take his eyes off the lead plane. His job is to stay within a few yards of three planes moving in three dimensions at the speed of a flat-out Ferrari. Radio communication is fast, precise, coded. There is no improvising up here. I wish I could see the formations from the ground; formation smoke trails making wide chalk lines on the blue. I wish those below could see what we see up here—open land and sky pressed tight to each other in a twirling waltz.

The crowd-pleasing highlight of the show is the Rubber Chicken Drop. Each plane will make a low pass over the airfield, and each back-seat bombardier will try to hit a yellow pickup truck in midfield with a terrified rubber chicken. My brother, the chicken and I have rehearsed this here to win, goddamnit. When our moment comes, my job is just to push back the canopy and release the chicken, without breaking an arm in the headwind. But, though my brother’s course was true, and my toss exactly as rehearsed, the chicken—that little shit—missed the truck by half a hangar-length, at least.

Back on the ground and unbuckled, we sit for a minute letting the engine wind down. I’ll be back to do this again next year, if we can pull a better chicken in the draft pick.

— Leslie Nicholson

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In December of last year, my brother-in-law invited me over to San Diego to fly in his Yak-52. My last experience flying light, single-engine aircraft was nearly 30 years ago when, employed as a North Sea helicopter pilot, I used to instruct in my spare time at the local aero club in a variety of Cessnas, Pipers and, one of my all-time favorite airplanes, the DH Chipmunk. Having retired from the world of helicopters in the mid 80s I embarked on an airline career—and that coincided with the end of flying for pleasure in small airplanes.

After two flights with John in his Yak-52, I realized that I had rediscovered the joy of flight. This article is intended to give an insight into the wide gulf that exists between flying modern jet transport aircraft, and flying relatively, high-performance piston-engined aircraft—and the steep learning curve in making the transition back to this type of aircraft. I returned to San Diego this Fall with the intention of obtaining my US Airman’s certificate and checkout in a Yak-52.

As many readers may be aware, long-haul airline pilots, it would be fair to say, tend to lose some of their “stick and rudder” skills, and this, coupled with the wide differences between the flight deck of a modern airliner and the cockpit of the Yak 52, adds to the steep learning curve.

In Hong Kong, at my day job, I turn up for work, to carry out a clearly defined task, generally one long flight from A to B. A team of people have already completed flight planning, provided me with weather and notams, have carried out all of the required maintenance checks on the aircraft, and pre-fueled it to a standby load of approximately 100 tons of jet A1. The crew, consisting of a Captain, two First Officers and a Second Officer, then review the flight plan with regard to the weather information contained in the briefing, and make an informed choice about the exact amount of fuel to be loaded. The computer flight plan will have already calculated the minimum required fuel to the nearest 100 kilos, on the basis of the aircraft weight, routing and average head or tailwind component over the route. The crew is encouraged to further refine this fuel in the light of changes to the aircraft’s actual weight as a result of changes to the payload.

Armed with this information, the crew proceeds to the airplane to carry out their preflight checks. The flight then begins, by accelerating approximately 390 tons of metal, high octane fuel and payload, down a two-mile long runway with the intention of flight. Risk analysis may indicate that this could be considered somewhat hazardous! By comparison, my first flight with John in the Yak-52 involved driving to the airport, opening the hangar doors and towing the aircraft out of the hangar. John then encouraged me to climb up the step ladder to top-up the oil tank and conduct a walk around, prior to lowering myself into the cockpit.

As I struggled with the straps of the parachute, then the five-point harness, sitting in my flying suit, I was already feeling hot and stressed. The layout of the panel in front of me, with its knobs, levers and switches—some in Russian, was so different as to be almost alarming. John guided me through the pre-start procedure, and finally as I pressed the Start button, the engine exploded into life, with a large cloud of smoke and a cacophony of noise.

Now the fun really started. After fumbling with the brake release lever, we taxied gingerly towards runway 27 at Gillespie. We snaked down the taxiway as I over-controlled the brakes and rudder. John commented from the back seat: “Well, it looks like you have the ground handling sorted out!” Power and pre-takeoff checks completed, we are cleared for departure.

Having lined up with the runway centerline, I slowly advanced the throttle to takeoff power—what happened to the concept of pressing the TOGA button to automatically set takeoff thrust? The instruction to lift the nose wheel off early, which I was encouraged to do, is NOT something I regularly employ during the takeoff roll on the Boeing 747. However, with John’s insistence on this, we were airborne somewhat sooner than I expected, and I then struggled to find an appropriate pitch attitude, while fumbling with the gear lever, throttle and prop RPM controls.

With only a brief moment to admire the scenery, John was calling for a right turn, whilst mentally I was still on the ground. En route to Ramona, as we passed over El Capitan reservoir, I tried some turns to the left and right. Using 25° of bank angle (the normal bank angle in my day job), was considered woefully inadequate, and I was encouraged to increase the bank to 60°, while searching for the correct pitch attitude to maintain level flight.

Next we looked at the slow-speed handling characteristics, and a stall with power-on was initiated. My normal stall recovery technique would be to lower the nose approximately 5° below the horizon, apply full thrust at the first indication of the stall, ei-
ther aerodynamic (in the form of buffet) or the stick shaker, while keeping the wings level, if required, with aileron.

This was clearly not going to cut it here.

With the pitch attitude, at what seemed to me, approaching 20° nose up, and the aircraft starting to roll and yaw alarmingly, my attempts to use rudder to keep the wings level, and hold the aircraft in the stall, proved inadequate. The aircraft quickly flicked to the left, and I found the ground below filling the windscreen.

I exercised a recovery, i.e. un-stalled the wings, rolled wings level, then pitched up to a climbing attitude with full power. The power-off stall was, for this airline pilot, just as exciting.

This part of the exercise completed, we continued towards Ramona, and talked about the approach and landing. It would be fair to say that, in my day job, the emphasis is on stabilized, 3° approaches. With all jet-transport aircraft, rate of descent is controlled by pitch attitude and thrust controls speed. Yak pilots might ask why airliners carry so much thrust during the course of the final approach and into the flare?

With the gear and flaps extended, the aircraft is in a high-drag regime. The turbofan engines are slung under the wing, and thus don’t contribute to lift in the way a centerline propeller does (i.e. propwash over the wing) Without this relatively high-thrust setting, the speed would decay and a very high rate of descent would develop, which would be hard to arrest with just pitch-up input close to the runway. Every approach to land is effectively a short-field landing. The approach is flown at precisely 1.3 Vs1/VSi, with a small five knot addition in normal conditions. This is to guard against the possibility of a runway overrun. At a typical approach speed of approximately 150 knots, a 3° glide slope equates to an 800'/minute rate of descent. A descent rate in excess of 1000'/minute is likely to trigger a "DON'T SINK" warning, and a significant risk of a hard landing.

On the Boeing 747, the flare is initiated at 30' radar altitude. Thrust is reduced slowly to idle at 10' radar altitude, and the aircraft touches down on the main gear. The nose wheel is lowered as soon as possible thereafter, with prompt application of automatic speed brakes, automatic wheel braking, and the application of the thrust reversers.

In the flare, the aircraft is NOT held off. To do so would be to risk the possibility of a tail strike. The objective is to get the wheels on the ground approximately 1500' air distance from the beginning of the runway and, employing all means available, to decelerate the aircraft once it has touched down.

But now we come back to the Yak-52. John reminded me, long since forgotten from 30 years ago, that power controls rate of descent and pitch controls speed, in these single-engine piston airplanes. Inevitably, my first attempts at the approach did not comply with the normal Yak operating procedure of a steep, almost power-off approach, at 100 knots. John casually observed that my final approach trajectory appeared somewhat flat, then, as I added power, the speed increased briskly while the rate of descent was unchanged.

Hey, Jet Man...

Again, holding off in the flare was also proving to be difficult as I was trying to unlearn the techniques ingrained into muscle memory of the last 21 years of flying wide-bodied jet aircraft. After several miserable attempts, we taxied off the runway towards Chuck Hall aviation to shut down, debrief and refuel. I climbed out of the cockpit bathed in sweat, convinced that it could surely not be possible for me to relearn this technique.

John explained the rationale for this type of approach in the Yak—the ability reach the runway in the event of engine failure, whilst retaining sufficient speed, (energy) to arrest the relatively high rate of descent, and achieve a smooth touchdown.

So began the transition back to flying for pleasure, after so many years of flying ultra-long-haul operations from Hong Kong, across the Pacific Ocean, to the US, and across the Steppes of the former USSR, to Europe.

I have subsequently completed a check flight in the Yak-52 to meet the required standard for my high-performance and complex checkout. However, you may draw your own conclusions as to my progress since a brief video of the takeoff and landing is featured on "The Yak Collection" Facebook page. All too soon, it is time to return to Hong Kong and my "day job."

By the time of my next return to San Diego for some more Yak flying, I shall no doubt have to relearn the techniques for handling these iconic airplanes.

I would be wise not to employ these new techniques when I next pilot a Boeing 747. If I were to do so, (assuming that I did not break the airplane), I feel sure that I would be called to my Chief Pilot’s office for a "tea and biscuits" chat, except there would be no tea and certainly no biscuits! ★
There are many advantages inherent in having an airplane that’s experimental exhibition. I could go on and on about the cheapness of parts, or some of the unconventional maintenance or other mechanical practices that you can do, as compared to a type-certificated airplane. But, I’m going to concentrate on the fun things. One of the fun things I did with my airplane was put on ox/propane guns. Also bomb racks, so I could drop bombs (big, Styrofoam ones), or even a dispersal unit for human remains, i.e. ashes. (Well maybe that’s not so much fun). But I would like to relate, in this short article, to something that was fun and might be useful.

In World War II a large number of land-based fighters, in particular the English Spitfire, were flown off aircraft carriers, as part of the delivery technique, to different regions of the war. These airplanes weren’t expected to land back on the carrier, but to simply take off and go to a shore base. The Spitfire had a flap similar to the Chinese CJ-6. It had two positions: up and down, (90°!). Of course, they took off with flaps up. The Brits figured the Spitfire would get off the deck of the carrier a bit easier and faster if they could use a partial flap angle instead of the landing flap angle. But, why go to a big modification program just so you could deliver an airplane? They worked around it by using wooden blocks that were of sufficient length that, when placed in the flap, would allow the flaps to come up a certain distance, and stay there for the takeoff. After takeoff, the gear was pulled up, and at a safe altitude, the flaps were dropped partially to allow the wooden blocks to fall out. The flaps could then be retracted for the cruise portion of the flight. The CJ is set up almost perfectly for this kind of scenario. It has a split flap, the same as the Spitfire. And it only has two positions: up or down. If you lose pressure while they are down, the flaps will bleed up, or, if the airplane is sitting on the ground, they will be pulled up by the bungee cord in the flap well. What I decided to do was use this World War II technique to set a takeoff, partial flap position, on my CJ-6.

What flap angle should I use? I could go into the NASA book, “Theory of Airfoils,” and look up the lift/drag ratios for different flap settings for the 23015, CJ-6 airfoil, and then figure a way to measure the angle on the bottom of the wing. There is a slightly faster way, which is accomplished by looking at the angle of the aileron when it is deflected fully down. Aileron travel is designed to give you maximum performance for roll for a particular airfoil. The aileron down position is designed to increase lift. This angle will be the same as the best lift angle for a flap. So, all one needs to do is measure the angle on the aileron while it is in the down position. And, of course, it doesn't matter which aileron. I did this by simply laying a piece of cardboard in the space between the inboard part of the aileron and the wing panel, and penciling in the angle for the flap.

Surprisingly, it came to exactly six inches. I then made cardboard blocks, six inches by roughly three inches, and glued them together to form a block 6” x 3” by approximately 1½ inches. This is not really important as to the exact dimensions, except for the length of six inches. With the air system turned off and the flap handle in neutral, I was able to pull the flap down by hand until I could stick the cardboard blocks into the flap well. Now, a bungee cord and aerodynamic pressure would hold the flap in that position during takeoff. I was a little concerned that one block might cause a torsional bending of the flap along its length, so I made a second block and placed them both just outside the wing root, on either side of the airplane—that would distribute any stress to both blocks, and keep the flap square against aerodynamic loads.

Now, after takeoff, I could retract the gear and then drop the flap to the landing position—at that point both cardboard blocks would fall out. I could then raise the flaps to the up position and continue to climb and cruise. To make sure that both blocks fell out, I put a piece of cotton cord between them, loose enough so it would not flop in the breeze below the flap. Therefore, when I...
dropped the flap after takeoff, if only one block fell out into the airstream, it would pull out the other block.

Why make the blocks of cardboard? Very simple, really. One: once cardboard is glued together in a block, they are quite strong. Two: they're biodegradable, as is the cord that holds them together. Unlike operating off a carrier in World War II, where wooden blocks would simply drop into the ocean, wooden blocks dropped around our airpark or even over water take a long time to degrade, and, quite frankly, are a little heavy. Made of cardboard, and simple cotton cord, then dropped into the woods or anywhere, it wouldn’t take long before they would degrade back into the soil. And three: they would not cause any possible damage if they landed on the roof of a car or house. Of course, I would pay particular attention to where I dropped them.

Results

To test the new flap position idea, I did three takeoffs at my home field, FD44, under normal configuration (flap up) and three takeoffs with the new flap position, plus one takeoff with flaps full down. I planned to use the same technique for all seven takeoffs—the tail of the airplane would be placed over the end of the runway; hold brakes, and apply full power. To keep from having to apply brakes for directional control, thus effecting takeoff distance, the airplane was pointed slightly to the left of runway center line and offset to the right of the center line. I would start applying back pressure on the stick to rotate between 55 and 60 knots IAS.

Field conditions were: a firm, sod runway with two inches of grass (this does increase takeoff distance). Temperature approximately 89° F, and a 50° crosswind from the right, at less than five knots. I found the distance for normal flap up, averaged approximately 339’. I then made three takeoffs with the flap blocks in place, giving me partial flap. I found that the takeoff distance decreased to a tight average of 296’. So, there was a decrease in takeoff distance but not as great an amount as I thought there would be. However, I did seem to get to a 50’ height sooner with the partial flap; although I did not measure the distances. I made one takeoff with the flap full down which used 489’. Also, dropping the cardboard blocks worked just fine.

Would this have gotten me off the deck of a World War II aircraft carrier? With a good sea breeze and the boat at flank speed, most certainly! If I remember correctly, Doolittle’s B-25 had a 467’ deck run off the Hornet, (CV8). I would be happy to demonstrate this to any Navy Captain, if one could get around the bureaucracy of getting my airplane on a carrier, in this day and age. Anyway, you might want to try this out. It’s easy, and it would be fun to see your results and re-live a little bit of World War II history. ★
Tim "Teflon" Stevens' Yak-52W

Manufacturer: Romanian (1999)
Model: Yak-52W
Engine: M-14
Prop: Three-blade MT
Upgrades/Mods:
Dynon D-10A Artificial Horizon
Garmin 596 Coupled with Trutrak Autopilot
Garmin SL30 NAV/COMM
Garmin 327 Digital Transponder
Horizon 1000 Digital Tach
Advanced Flight Systems AOA
JPI Engine Analyzer
Vortex Generators-Wings and Tail
Pulse Landing Light System
Aux Fuel Tanks-74 Gal Total Capacity
Electric Oil Scavange Pump
Cleveland Brakes-Toe Activated
Air Wolf Oil Filter
Smoke System
On the 22nd August 2003, the pilot of Yak-50 registration G-YAKK started his motor normally and allowed it to warm up. A few minutes later he released the brakes and had begun moving slowly forward when “there was a loud bang.” The main-air bottle had burst, fracturing two pneumatic lines and a fuel system line. A two foot diameter hole was punched in the lower fuselage, three other holes were made in the upper fuselage by explosion fragments and one fuel tank was deformed. The aircraft was described as “damaged beyond economic repair.” The UK report is a great read, with amazing photographs. It can be found on the internet here:


It’s chilling to consider that not only could G-YAKK’s air bottle have ruptured in flight, but also how close these same bottles are, in a Yak-52, to the passenger. Whether you like it or not, we are all, Yak, Nanchang, Sukhoi, and L29/39 alike, flying around with onboard bombs, pressurized to 750 psi.

**So when is an air bottle NOT a bomb?**

When an internal visual inspection and hydrostatic testing confirms that the bottle is still capable of performing the service expected of it. This test is recommended every five years. There are two air bottle failure modes (rupture, and slow leaks caused by pin-holing). The report, above, suggests a widespread belief that non-catastrophic pin-holing is “more likely,”—this has led to “inappropriate attitudes towards prevention, detection and rejection of corroded bottles.”

Further, the report noted that even if the manufacturer’s proposed maintenance schedule were followed—“bottles to be removed every 50 hours and drained”—it is unlikely that corrosion would be inhibited, because of the constant presence of moisture during operation. In light of this, the UK agency recommended one year, rather than five year, proof-pressure testing. In fact, annual visual inspections are common in the compressed gas industry. SCUBA cylinders, for example, are required to undergo an annual visual inspection, and they are constructed of materials suited to resist corrosion.

Perhaps, in 2003, replacement bottles were more readily available. If you have tried to get your hands on one of these bottles lately, you’ll know all about the “cost factors” that might be causing that “attitude.”

Finding new Yak main air bottles is an ongoing problem for current and prospective owners.

**Getting them tested**

If you want to remove the bottles from a Yak-52 yourself, it’s not an enormous job. The rear seat comes out first.

Your aircraft may be fitted with one of the George Coy “wrap your passenger in fuel” style, reserve-fuel tanks. If so, plan an extra hour to remove that, because the safety-wired turnbuckles on both main and emergency Yak-52 air bottles face forward, and are obscured by this reserve fuel tank.

Do remember to vent both air bottles before releasing the connections! With the plane’s gear down and locked, cracking either of the emergency air handles will soon vent that circuit, and it’s up to you how you choose to vent the main circuit serving flaps, brakes, and starter. Also remember to check your plane, since “no air” means “no brakes.” The tee on the top of the emergency bottle has different size threads to ensure correct reassembly.

As luck would have it, there is a tank-testing company in LA that has recently moved into a brand-new test facility. Brian Tyminski was kind enough to meet me at Fullerton airport. As we drove the short distance to his FAA repair station, he gave me the 411 on the past and the present of Compressed Gas Systems.

In 1948 Brian’s grandfather started Tym’s Inc., servicing fire extinguishers. In the 1950s, soda/acid fire-fighting technology was being replaced by pressurized CO₂, and similar, pressurized systems also began to appear in aircraft. In 1956, Grandfather hired an individual named John to focus on just the aviation-cylinder business—which by the seventies had become prodigious. Sadly, John died a few years ago, and Brian stepped up to take his place. In 2012, Brian bought the aircraft side of the business from Tym’s, moving it to Cerritos. (Tym’s Inc. is still in Inglewood and continues to provide commercial, non-aviation compressed gas and fire extinguishers services)

Brian has targeted both general aviation and the business jet markets, choosing to remain clear of big air carriers, and in 2013, his business has tripled.

That means the doors are open for everything from Gulfstream to Yak, Mig, and Nanchang!

CGS currently services:

- Halon-based fire extinguishing systems and portable fire extinguishers
- Aviation oxygen systems including

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**ON BOARD**

By John Warwick john.warwick1@gmail.com
pressure regulators, valves, cylinders, lines, and fittings

- Pneumatic systems – such as our Russian and Chinese air bottles.

The 750 psi rating on our air bottles is considerable, but still meager when compared to pressurized oxygen in modern bizjets—typically 1850 psi. Gulfstream aircraft have other systems requiring 4500 psi—and for that reason, CGS can test up to 10,000 psi.

The internal surfaces of modern steel cylinders are “Parkerized,” or surface treated to prevent corrosion. The Russian bottles are not processed like that. Brian observes, by this stage in their life, the repeated introduction of moist, compressed air, has created small but acceptable amounts of pitting and corrosion in nearly all Russian/Chinese bottles he has inspected. The G-YAKK report contains a cross-section photo of the failed air bottle wall. The wall thickness when new is only sixty thousandths of an inch. As that picture shows, the thickness remaining after bad pitting had taken hold was alarmingly small.

Clean up time

At CGS, the refurbishment process starts in a dedicated cleanup room. All grease and oil contaminants are removed, prior to testing, and it is here (by visual detection of mechanical problems) that 99% of bottles fail. The staff at CGS has been trained to detect a multitude of problems, including damaged, or missing threads, internal corrosion, and pitting beyond acceptable limits.

Acceptable bottles are then de-greased internally and hot air-dried in preparation for hydrostatic testing.

The water jacket test

My main air bottle was prepared with an adapter to add pressurizing water once submerged in the hydrostatic test chamber. Flowing water eliminates any air inside the bottle under test, then with the chamber sealed, the working pressure of 750 psi is applied. The system pressure is monitored, and stability will indicate that there are no leaks.

The basic idea of the hydro, or “water jacket” test, is to note the change in volume of the pressure vessel (as water pressure is increased inside it) by accurately measuring the water displaced by its expanding outer surface. How well it returns to its original shape after relaxation is a health check of the vessel’s metallurgy.

The Department Of Transportation oversees cylinder manufacturing, testing and performance specs to ensure the safe transport of the pressurized cylinders. However once a pressure vessel is mounted inside the aircraft, it’s considered part of aircraft—and it becomes the FAA’s responsibility! The bottles installed in our aircraft were not manufactured to DOT specifications, so industry, OSHA, FAA, and DOT rules are implied by CGS to ensure a safe, and reliable inspection procedure. CGS uses 200% of duty pressure for 60 seconds. This is a standard for welded DOT spec cylinders, such as those found on fire extinguishers.

As my air bottle expanded under internally applied water pressure, water left the rigid test chamber, was lead to a beaker on an accurate scale. The expelled water’s weight was measured in grams. When the test pressure of 1425 psi was applied, my Yak main bottle expelled 157 grams, (and so 157 cubic centimeters) of water.

A stretched spring should return to its original length when the load is relaxed, and so is the case for pressure vessels. If it doesn’t, and remains stretched, this is an indication of under-performance, and possibly the approaching end of useful life.

The DOT criterion is that up to 10 percent residual stretch is acceptable. So when the internal pressure on the cylinder is relaxed, you would expect to see a zero on the scale if the bottle has returned to its original size. In my case up to 15.7 cc residual would be OK. If the bottle under test does exceed this residual limit, DOT test criteria allow for a retest, but it must withstand an additional 10% pressure. If your bottle passes, (as most do, according to Brian), it will be metal-stamped on the neck or grounding lug with the month and two-digit year of the successful test. CGS also attaches a sticker with the date of the next retest.

Remember to adequately package your cylinders for shipment to the test lab. They are now too rare to allow them to be damaged in transit.

If your tank failed, what now?

With experimental-exhibition airworthiness certificates, we are at liberty to do what we must as replacements for original parts become scarce. But Brian has words of caution for owners considering adapting other tanks. The owner of the Yak-50 shown in this picture has adapted a Boeing 737 halon tank after the original Yak factory air bottle failed hydro. Some halon systems operate at lower pressures than our Yak pneumatic systems, but they are also an emergency system, designed to discharge by the pyrotechnic fracture of a critically designed rupture disc, (this can be seen facing the camera). Any modifications to an approved DOT pressure vessel are illegal according to transportation law, and may be viewed unkindly by the FAA.

On top of that, the rupture disc is an intentional point of failure that did not exist in the original Yak bottle design.

On the upside, I understand there is a perfectly sized Carbon fiber bottle for Yaks that is used in the SH-60 helicopter, (used to inflate the emergency flotation device.)

The good news—you can pick one up for around $15,000.

Good hunting for your next air bottle, and until you absolutely need one, get them tested on schedule. CGS is working with cylinder manufacturers in the aviation industry to design a direct replacement for the Yak air bottles. Development is currently ongoing. ★
As a group, pilots tend to be healthy, or at least we start out that way. In the beginning, we have to pass that FAA medical exam to receive a student pilot certificate. Then, unless we leave aviation, we all become “aging” pilots. With age comes mileage and, even though the FAA checks up on us every so often through its medical examiners, we need to learn to assess our own fitness to fly.

Fitness to Fly

Between aviation medical examinations, you act as your own AME, and you must decide on any given day whether you are safe to fly. The FAA has rules that provide guidance in this area until you see your doctor again. These are covered in Federal Aviation Regulation (FAR) parts 67, 61.23, 61.53 and 91.17. As pilots we should all be familiar with the regulations that pertain to us.

In addition to the FAR’s, the FAA website www.faa.gov contains links to many publications about aviation medicine and pilot safety. For example, the “Pilots Handbook of Aeronautical Knowledge” includes a chapter devoted to aeromedical factors. It contains good descriptions of our body’s normal functions as they relate to pilot performance and flying. It also contains a review of the common side effects of many medications. The FAA “Risk Management Handbook” includes the I’M SAFE mnemonic used by some pilots to assess their daily fitness to fly. The mnemonic is interpreted as:

I - Illness - Is the pilot suffering from any illness or symptom of an illness which might affect them in flight?
M - Medication - Is the pilot currently taking any drugs (prescription or over-the-counter)?
S - Stress - Psychological or emotional factors which might affect the pilot’s performance?
A - Alcohol – FAR 91.17: Consider the 8 hour, 0.04% rules. And hangovers are dangerous, and considered an “influence” that you are “under”!
F - Fatigue - Has the pilot had sufficient sleep and rest in the recent past?
E - Eating - Is the pilot sufficiently nourished?

If there is any question whether you meet medical guidelines to fly safely, there are other resources at your disposal. In between flight physicals, you can still call your AME. Additionally, the Aircraft Owners and Pilots Association (AOPA) has several resources including the AOPA Medical Certification Department at 800/USA-AOPA, as well as detailed information available at AOPA Online.

Chronic illnesses and medications definitely need to be reviewed with your AME. When a chronic condition can be treated by a choice of several medications, the AME might be able to guide the choice toward a medication most compatible with flying. But what about minor issues that crop up between visits? Are over-the-counter medications safe for flying? Is there a printed list of what I can and can’t take and still be “legal” to fly?

Medications “Approved” by the FAA

The FAA does not publish a list of “approved” medications, and for good reason! There’s no way to make sure that any medication is always safe for flying. Having said that, even though there is no official list, Pilot Medical Solutions (http://www.leftseat.com/medcat1.htm) has communicated with the FAA to compile an unofficial list of generally acceptable (and in some cases, specifically unacceptable) medications. While this list is fairly comprehensive, use caution because the validity of such lists is extremely short lived. And revisit your responsibilities under FAR 61.53 (2) and 91.17(a)(3) above.

Regardless of whether your prescription or over-the-counter (OTC) medications are “approved,” one of the FAA’s primary concerns is whether the underlying medical condition being treated is compatible with safe flying. For example, the FAA would normally consider it OK for you to use pseudoephedrine (Sudafed) to clear up mild nasal congestion; however, if you’re using the same drug to resolve congestion-induced vertigo, you would not be considered fit to fly.

When assessing your own fitness to fly, keep in mind your body’s reaction to medications as well. Even a drug that is generally considered safe can cause adverse side effects or allergic reactions. If you have had any such reactions in the past, you should not fly while using that medication. For example, if the Sudafed you’re using to control mild nasal congestion starts causing dizziness, headaches, or irregular heartbeats, you definitely should not continue flying while using the drug.

If you’re using any medication for the first time, give yourself 48 hours on the ground to check for any adverse or allergic reactions and generally see how the medication affects you. While this will be enough for most medications, there are some that may require additional time or specific checks before you’re cleared for takeoff.

“Hot Topics” in the Recent News: Sleep Apnea & Obesity

Sleep is a group factor that can affect your fitness to fly. While all pilots need to assess whether they are sufficiently rested to fly safely, the FAA has recently proposed screening all obese pilots for Obstructive Sleep Apnea (OSA) as a requirement for the FAA medical exam. What is sleep apnea? It is a condition that causes people to stop breathing for frequent, short periods during their sleep. In severe cases, it can contribute to profound fatigue during the daytime. If you haven’t heard of it or the proposed FAA rule, it might be worth your time to review this through the AOPA website (www.aopa.org/news-and-video) and view the AOPA’s thoughtful response to the FAA proposal. Basically, for pilots with a body mass index (BMI) over 40, the FAA would require an overnight sleep study in a sleep study center, which can be both expensive and inconvenient. Over time, the BMI of 40...
would be lowered to require more pilots to be screened. What is your BMI? Calculate it by your taking your weight in kilograms, and dividing it by your height in meters, squared—or, check out one of the many BMI calculators and charts online.

Most of us can’t help but pick up a few pounds over the years. But one pound a year over twenty years can make the difference between being an ideal weight (BMI 18-25), overweight (BMI 25-30) or obese (BMI 30+). In addition to increasing your risk for sleep apnea, being overweight or obese leads to many other health problems that can affect your fitness to fly, including high blood pressure, diabetes, heart attacks and strokes.

I can tell you from my medical background, and both personal and family experience that low-carbohydrate diets work amazingly well. By reducing or eliminating the sugars in your body available for quick energy, your body is forced to metabolize fat, which it doesn’t ordinarily like to do. It likes to keep fat around because it’s the most efficient way to store energy for long term use. Unless you have advanced training in nutrition, any weight loss approach should be medically supervised to avoid problems like dizziness, electrolyte imbalances and kidney damage. And you should consult your AME about your fitness to fly while on any specialty weight-loss diet.

Further Reading
There are two aviation publications that have a monthly column devoted to pilot health: AOPA Pilot and Soaring magazine. If you haven’t already guessed, I have been a longtime fan of AOPA and its mission. The organization’s monthly magazine AOPA Pilot carries a series of articles by Dr. Jonathan Sackier titled “Fly Well” that address medical issues for pilots.

Soaring is the monthly magazine published by the Soaring Society of America, the US organization for glider pilots to which I’ve been a member since 1979. The magazine carries a very well-written series of articles titled “Soaring Rx” by Dr. Daniel L. Johnson. The Soaring Rx articles are written in an easy-to-read format that illustrates how a particular medical problem affected a particular pilot involved in an aircraft accident. Many of the case reports involved highly-experienced pilots and are well worth reading. They can be found at http://www.danlj.org/~danlj/Soaring/SoaringRX/.

Summary
We all started our flying careers with the ability to pass the FAA physical. Eating right, managing medications, and continually assessing our own fitness to fly will buy us more time not only in the air, but on the ground as well. Stay healthy, my friends.

Mike Pfleger is a FAST rated Flight Leader and flies his own T-6, as well as being rated in many other aircraft.
So, you’ve mastered close formation, and have your wing or flight lead card. Looking for a new challenge? The next logical step is to learn to fly Tactical Formation. Every fighter pilot learns tactical formation early in his flying career, and employs it every single day in training and combat. This article will introduce the basics of tactical formation. In a future article, we’ll work on advanced tactical formations. In the future, you will see this topic included as an appendix to the RPA formation manual.

Why Fly Tactical Formation?
The reason that combat pilots employ tactical formations is for visual lookout, survivability, and tactical surprise. Back in WWII, wingmen flew what was commonly known as “welded wing”. Wherever lead went, number 2 was close behind, and he usually kept lead from being shot. However, no one was really checking 6 for poor #2, and this led to unacceptable losses from unobserved gunshots. With the advent of the jet age, the “combat spread” was developed to gain visual mutual support. It allowed each pilot to check the other’s 6 o’clock, and made it more difficult for the enemy to visually detect and engage both aircraft at once. With the advent of air-to-air radars and missiles, this spread formation aided in electronic lookout, offensive maneuvering, weapons employment and tactical surprise. It is also highly effective in the low altitude area for maneuvering and defeating surface to air threats, since only one aircraft is typically engaged at a time by guns or SAMs. After becoming familiar with tactical formation, it will become second nature, and you’ll become as comfortable in tac form as you are in fingertip.

Definitions and Comm
Let’s start with some definitions. The basic two ship is called an Element (or Section in Navy terms). A Flight (or Division) is a four ship. We will only talk about two-ship tactics in this article. Basic comm brevity is defined in the RPA Formation Manual, and is similar to what you already use. Below are some additional brevity words you’ll need to memorize. Wingmen are not limited to “Two,” “Bingo,” “Mayday,” “Lead you’re on fire,” and “I’ll take the ugly one” anymore.

Bogey—Unknown aircraft
Bandit/Hostile—Confirmed enemy aircraft
Visual—I see a friendly Aircraft
Blind—I do not see the friendly aircraft
Tally—I see the bandit/bogey
No Joy—I do not see the bandit/bogey

Tac Form Communication
(No reply is expected from the wingman)
“Viper 2, go tactical left/right side:” Wingman will go to line-abreast position
(Visual signal in lieu of radio call: From the route formation position, the visual signal to go to tactical formation is for Lead to porpoise his aircraft.)
“Viper, 90° right/left, go:” Delayed 90° change of direction
“Viper, 45° right/left, go:” Delayed 45° change of direction
“Viper, Hook right/left, go:” 180° in-place turn
“Viper, Cross Turn, go:” 180° turns, both aircraft turn into each other
“Viper, Check XX left/right, go:” 10° - 30°of in-place heading change
“Viper, In-Place XX left/right, go:” both aircraft immediately turn the directed amount
“Viper, Shackle, go:” Used to clean up fore/aft formation errors or to move the wingman to the opposite side of the formation.

We will cover these turns, and the applicable comm, in detail, shortly.

Figure 1—visual lookout priorities (low altitude)
**Responsibilities**

When in tactical formation, there is a division of responsibilities to ensure that the formation is effective. Lead is the primary planner and decision maker, performs route navigation, target look-out and acquisition, and lastly visual lookout and mutual support of #2. Number 2’s job is to maintain formation position, and provide visual lookout and mutual support of #1. If possible, #2 has navigation position awareness as responsibilities allow. Because many real-world tactical formations operate at very low altitudes, terrain awareness is the first responsibility for both pilots. The mantra I taught new F-16 pilots was “near rocks, far rocks, lead, check 6”. First, avoid hitting the ground right in front of you, next be aware of terrain farther ahead of you, then monitor your formation position, and finally check 6 to ensure no unobserved threats. Figure 1 shows the wingman’s visual scan pattern, with #1 being the most important, and moving to #4. At higher altitudes, terrain avoidance in sector 1 becomes less important. As with any lookout, take at least a couple of seconds in each sector to scan for threats. Your head will be constantly moving. One of the things I often see as Red Air for Desert Thunder is that no one is looking outside of the formation (sectors 3 and 4), instead looking too much at each other or trying to navigate the course. Unobserved entries are certainly fun for a bandit.

**Formation Position and Station Keeping**

The proper formation position is one that allows each pilot to check 6 of his wingman out to a distance that will detect a threat before it can shoot. Since we will simulate a gun only threat, we need to look behind our wingman out to about 1000 feet. We will fly what is called the "Line Abreast" position.

![Figure 2—line abreast formation](image)

You determine horizontal alignment by imagining that you have rank on the shoulder of your flight suit and putting lead there. It will be uncomfortable to look that far left/right...it’s supposed to be! If you fall behind, it becomes difficult for lead to check your 6, and will not make our tactical turns work out correctly. The 20° aft of line abreast position shown in the diagram is the maximum allowable error, you should always be working back to line abreast.

In order to judge distance, I’ve come up with some rules of thumb for our type aircraft. The distances are important for visual lookout and turn geometry due to our small turn radius. If your eyesight is significantly better or worse than average, these might not work for you! The first point is 250ft spacing. This is where you can still see lead’s hand signals and is just outside of route formation. At 500ft, you can still see lead’s helmet and the aircraft details (rudder, etc). At 750ft, you can see the canopy outline and still see the aircraft insignia (Red Star, Stars and Bars, etc). At 1000ft, you see mostly a silhouette, and you can only discern a rounded Yak versus square CJ vertical tail. As with the fore and aft position, you are striving to always remain in a 750-1000ft window.

**Turn Execution**

Using our descriptions above, you can now fly tactical formation in a straight line. The challenge now is how to execute turns. In order for these turns to work, there is a contract that must be followed. For our Yak/CJ aircraft, this means that we will fly at 120kts IAS, all turns will be 60° of bank at 2g’s, and we will maintain a constant throttle position (we’ll lose a bit of speed in the turn). The wingman will always go high on crossing flight paths, however the wingman will not cross lead’s flight path in order to go high. For example, on a cross turn, if the wingman is low, he will remain low during the maneuver. In all cases, the wingman is primarily responsible for element de-confliction. If lead wants the wingman to do something other than the contract turn, he will be directive. The last part of the contract is regaining position. If you find yourself behind the line, avoid large power changes. You can trade some altitude to gain speed and get back in line abreast. If you are ahead of the line slightly, then a shallow climb will slow you down to get back in position. If one aircraft is significantly ahead of the other, lead will direct a check turn to regain line abreast, or a “Shackle” that will get the aircraft in front back in position (description to follow).

The key to tactical formation is being able to fly the plane by feel. You will only get momentary glances at airspeed and attitude in the cockpit (remember your lookout scan in Figure 1). Be able to know what 2g’s feels like, and what the proper turn rate is. Watch lead and anticipate. Know where you will go when directed to turn 90° (hint - it’s directly on your shoulder). All turns are based on your line abreast range, and since turns rarely are perfect, a timely correction to your position goes a long way to effective tactical formation.

The first turn we’ll cover is the delayed 90° turn. From the line abreast position, lead calls “Viper, 90° Left, go”. In Figure 3, look at the left turning example. At the command, #2 will turn 90° per the contract and roll out. Lead will time his turn to roll out line abreast with #2 and the formation continues in the new direction. For the right turn example, Lead will initiate a 90° right turn. Number 2 will time his turn to roll out line abreast. In order to time your turn, you must evaluate your formation position. If you are in the 750-1000ft window, you begin your turn just as lead’s nose points at you. If you are closer than 750ft, begin the turn slightly prior to nose on, and float the turn a bit to regain spacing. If you are too far out, then turn after nose on and turn a bit tighter to adjust your lateral spacing. These are fluid events that will take some practice. After you gain experience, you’ll know when to adjust your timing.
The hook turn is the preferred method of changing heading 180°. While executing the hook turn, one aircraft will be blind for a short period of time. For turns away from the wingman, he will match lead’s turn rate so as to be at 0° aspect angle (dead astern) after 90° of turn. From that point, maintain the turn via the contract, and lead will fly off of #2 until the turn is complete. For turns into the wingman, lead will match #2’s turn rate through 90° of turn, then the wingman will re-acquire lead visually, and fly so as to roll out in line abreast position.

For turns less than 90°, you can execute the delayed 60° or 45° turns. They are executed with the same radio call “Viper, 45° right, go”. You observe lead turn 45°, then let your flight path cross in front of lead (#2 always goes high) and looking over your shoulder, you turn to regain the line abreast position. If the turn is taking too long due to being wide, you may turn across the nose of the other aircraft, then maneuver to regain the proper line abreast position. For the example of the 45° left turn, the wingman simply turns 45° and rolls out. Lead will perform the rest of the turn and subsequent positioning to line abreast.

To reverse the direction of the turn, you can use a Cross Turn or Hook Turn. (“Viper, Crossturn, go” or “Viper, Hook left, go”). Due to the nature of our aircraft turn performance and the contract, the cross turn will generally result in the formation being too wide, and will require corrections. The cross turn is just that, it crosses flight paths, so you must be aware of deconfliction roles (#2 goes high if he does not have to climb through lead’s flight path). Both aircraft MUST acquire the other aircraft until they pass. Lead will be directive if any conflict exists.

Finally, if the formation is not in the proper position, then a check turn may be the fastest way to regain line abreast. A check turn is called by “Viper, Check 30° left/right, go”. Both aircraft immediately turn the directed amount, and that should result in a line abreast formation, as in Figure 6. For the In-Place turn, both aircraft turn the directed amount (“Viper, In-Place 90° right, go”), this may result in a trail formation, such as an in-place 90° turn from line abreast. This is commonly used for g-warmup maneuvers.

To change the position of the wingman from one side to another, or to clean up a formation where the wingman is sucked aft, the “Shackle” is used. Think of this as a tactical crossunder. The command of execution is “Viper, Shackle, go”. Both aircraft will check 30°-45° into each other, with the wingman going high.
one aircraft is sucked aft, that pilot will use less of a check turn, so that he can catch up with the other aircraft. Both pilots should be maneuvering so as to regain line abreast position.

Rejoins from Tactical Formation
When it's time to rejoin from tactical to close formation, there are three types of rejoins, straight ahead, turning and from trail. For the straight ahead rejoin, lead will initiate with a radio call and/or wing rock, reduce airspeed by 10KIAS, and monitor #2 during the rejoin. The wingman will add power slightly, and begin to angle into lead, balancing power and aspect to maintain a controlled rejoin.

Turning rejoins from tactical are usually turns away from #2, initiated again with a wing rock and/or radio call. Lead will reduce speed to standard rejoin airspeed, if required, and will again monitor #2's rejoin. Number 2 will maneuver initially toward lead to reduce range, as the turn away will cause excessive distance. Once inside approximately 500ft, the rejoin is conducted normally. The last method for rejoining is from trail. Lead will direct an in-place 90° turn (“Viper, In-Place 90° left, go”) so as to put the wingman in trail. A normal turning rejoin can then be performed. Be aware of your trail range, and adjust your rejoin geometry accordingly.

Summary
Tactical Formation is the foundation of all fighter combat maneuvering. It provides mutual support, tactical surprise and offensive flexibility, and has served fighter pilots well for over 60 years. It is challenging, to be sure, however tactical formation is simply an extension of your current skills and builds recognition of geometry, fluid maneuvering and visual lookout. As with close formation, discipline is the key. Fly the contract, always maneuver back to the proper position, use your visual lookout priorities to avoid padlocking on lead, anticipate the next turn and listen to the radio. As with all of our RPA “Serious Fun” flying, you will enjoy it more and be safer if you are proficient. Chair fly some tactical formation scenarios in your head this winter, so that when you are ready to learn this new skill, a seasoned flight lead will show you how to fly tactical formation safely and effectively.

In a future issue, we will introduce wedge and fighting wing formations, and discuss options for 4 ship tactical formations. For specific questions, please don’t hesitate to contact me.

Certificate of Formation Qualification
Presented By The RedStar Pilots Association To:

In recognition of the successful completion of the prescribed course of formation training as required by the RedStar Pilots Association and the Formation And Safety Team (FAST)

AIRCRAFT MAKE, MODEL AND REGISTRATION NUMBER:

RECORDED ON THIS ______ day of ______ in the year ________

Qualifying Pilot               Check Pilot

Congratulations to our pilots who have achieved formation qualification
Wingman
Scott Powers 9/28/2013
Ron Stark 9/28/2013
John Swartz 10/12/2013
Lamar, Colorado

Left: Scott "KONG" McMillan leads a 4-ship with Joe "Felix" Wilkins on his right wing, Terry "Pumper" Calloway on his left wing, and Al "Raid" Tinnes in the slot.

Above: The coughing, lurching, clanking crew taxi has plenty of room for the entire Colorado Yak Pak.
Left: Mark "Navy" Davis takes part in a long-standing Lamar tradition, namely, flour-bombing the crew taxi, as it attempts evasive maneuvering, enroute to the airport on Saturday morning.

Above: Scott "KONG" McMillan pulls off the target following his dive-bomb run on the crew taxi.

Below: Ron "Miyagi" Stark shakes the water off after being doused by his Yak Pak comrades, in celebration of his wingman qualification—another Yak Pak tradition.

Photos by Donna "CK" Davis
Sunday, November 10th was the day of this year’s annual Santa Barbara Veterans Day Parade and Fly-over. On the ground, several local collectors brought out their vintage military vehicles, motorcycles, tanks and halftracks. And in the air, 17 aircraft were readying to make their passes.

To turn heads skyward, the Santa Barbara Sheriff’s Huey made the first pass above the parade route. It was followed by Darren Moore in his beautiful P-51. While offshore to the west, the Big Gaggle assembled.

Three flights made up the Big Gaggle: the lead flight featured a B-25, escorted by four Nanchangs from the Tiger Squadron, lead by Craig “Hey Suze” Ekberg. The C-47 brought up the second flight, with Scott “Gomez” Glaser in his Yak leading four Nanchangs. I led the last flight of four T-34s.

Each flight made a total of five passes over the town—three passes up State Street over the parade route, followed by two passes over the beach area in front of the VFW building. Following the last pass over the beach, the C-47 departed for its home base in Paso Robles, and the Tiger Squadron broke off from the B-25. This allowed the five aircraft that were escorting the C-47 to join on the back of the B-25 for photos.

The T-34’s final pass was made with number three performing the missing man. Also, on this pass, Lead brought the flight down to a “more favorable” (classified) altitude, for the crowd to get a better look at the planes.

I want to thank everyone involved for their professionalism, as always, the feedback from the viewers was extremely positive, as they say the fly-over is what really makes the Santa Barbara Parade a special event. ★
Mission Commander, Michael "Viper" Malaco leads the T-34 flight for the Santa Barbara Veterans Day Fly-Over.
Having taken a fall break, I'm back to talk about effective leadership. The winter edition of Kong's Korner will focus on effective leadership skills, and how to apply them to formation training. In my research of leadership styles, I decided to focus on three—the Autocratic, Democratic, and Delagative leadership styles. All three have their merits, and are appropriate to the kind of flying we do. As you read on, think back to a time in your formation flying history, and how each of these styles was applied, both effectively, and inappropriately.

Let's start with the Autocratic style of leadership. The Autocratic style of leadership is a simple concept. Layout a plan with clear expectations of the who, what, where, why and how of the flight (the briefing), then execute the plan with little or no input from the group. This method is not a strong method for making the best decisions so it is often left to the most experienced member of the group to take the leadership role. I lead, you follow, is the simplest description.

Under this style of leadership, the role of the wingmen is to follow the lead aircraft, and the leader’s role is to keep the wingmen safe. Careful planning, decision making and a high level of situational awareness are required of a good lead pilot. Wingmen must trust that the lead pilot is doing what he briefed, in order to accomplish a safe, and successful flight. Conversely, allowing a wingman to lead from the rear of the flight is dangerous and can lead to mistrust in situations that require quick reactions to dangerous situations.

An autocratic leader’s strength is his skill and experience. His weakness is his single-mindedness. In formation, we resolve that particular weakness by the use of the “Knock-It-Off” call. This is the one phrase that an autocratic leader must recognize, and recognize it not as a failure of leadership, but as a safety call in situations where his skill, and experience, may have failed him. Wingmen must not be afraid of reprisals, nor should a lead ignore the “KIO” call. It is the one tool that makes an autocratic leader highly effective.

Moving on, let’s discuss the Democratic leadership style or, as psychologist Kurt Lewin calls it, Participative leadership. Under this style of leadership, the leader encourages input from all members of a group. He encourages, and directs the group’s discussion, and leads them to the best decision. One thing that clearly differentiates the democratic leader from the autocratic leader, is that the democratic leader retains the authority to make the final decision, while all the while listening and taking input from the group. Airline Captains have been using this technique effectively for years (CRM). In order to arrive at the best decision, it is imperative that he calls upon the experience and training of the entire group. Buy-in from everyone is not necessarily required when making the final decision, but it makes for a more cohesive application of leadership. Democratic leadership can be effective in situations that are not immediately critical, but may become so, if timely and effective decisions are not made appropriately.
In our FAST world, democratic leadership is most often found in our instructor cadre. We select instructors who are experienced in these skills primarily because we are not teaching primary students. We are helping experienced, and skilled pilots, achieve a higher level of learning. We facilitate their learning by allowing them to explore the concepts on their own, with guidance and example from those that already possess the necessary skills. An autocratic leadership style does not lend itself well to the classroom. One could argue that a democratic leadership style is therefore not effective in flight. I would argue that there are times where a good lead pilot needs to employ both styles and recognize when each style is appropriate.

As an example, let’s examine a cross-country flight. There is, typically, not a high level of threat on a cross country. The lead has briefed a good plan but must evaluate that plan as he goes along. Changing weather, aircraft mechanical issues, and pilot fatigue are all factors that can be discussed amongst the group. The leader should rely on his planning, and experience, to guide the flight in the safest direction, whilst taking into account the inputs of the wingmen. Democratic leaders have a role in formation flight, but ultimately it may come down to the autocrat within us to make that hard decision that goes against the grain.

The third type of leader is the Delagative Leader. This is the type of leader none of us should aspire to become. This leadership style is really a façade of sorts. The Delagative leader may appear to be a democratic leader on the surface but he usually just goes along with the collective. This is a dangerous position to take. When the collective body decides on a course of action that is either dangerous or unsafe and the leader makes no effort to stop it, he has just subjected himself to the same dangers as the collective. Peer pressure comes to mind when we talk about this type of leadership role, but does it ever have a place in formation flying. I would offer one example of a time we employ this type of role effectively.

A new lead pilot, one who has never been in a leadership position, by default becomes a delagative leader. He has been put into a position of leadership but possess no experience other than that of being a wingman, subject to the leadership of others. This, by default, becomes the most dangerous time in formation training. We have placed a willing, but delagative pilot, in the lead of a flight that requires the use of autocratic leadership skills. It is imperative that we clearly define the role of this new lead pilot, and designate an instructor who can employ his democratic leadership skill set to teach the student leader how to overcome his delagative behavior. It is not until we recognize that a lead pilot candidate has overcome his delagative style that we turn him loose with a group of inexperienced wingmen. We have all been in flights where we choose to follow the newest wingman in the group. I just hope that that particular wingman has been given clearly defined instructions, and limits, because your life is now in his hands.

Think for a minute about your style of leadership. How does it work for you, and are you employing the correct style in the correct fashion? Many of us want to become lead pilots. Not all of us will become lead pilots, and that’s okay. Understanding your role and your ability is just as important to you as it is to your fellow formation pilots. Leadership is not a position that you are given, but one you have earned through education, experience and skill.

Fly Safe and Fly Smart
There are few things so elegantly simple, and yet so misunderstood, as the propeller. We all understand the propeller is a rotating airfoil, but the loads on the prop are very complex. There are many loads on the prop, the chief being centrifugal force—the blades trying to sling their way away from the hub. In addition, there are bending forces from the blade producing thrust, and torsional acceleration/deceleration loads from the engine. There are drag forces, and there are asymmetric forces because of the angle at which the aircraft moves through the air, in addition to wind from varying angles during taxiing.

All the parts need to work in harmony, both aerodynamically, and structurally. Since the prop is, proportionally, a large part of the dynamic weight, and since it turns relatively slowly, it can generate plenty of tactile feedback when it is not happy.

From an aerodynamic standpoint, the blades must produce equal amounts of thrust. Traditionally, this is done by measuring and setting the blade angles equally. This makes the assumption that all blades are created equal (they are not), that each blade has the same stiffness (they do not), and that the contours are the same (they most certainly are not). Amazingly, they are enough alike that the vast majority can have the blade angles set statically and work just fine. There is a lubber line on the blade clamp and an index on the blade. Gross errors can be seen here, but as little as $\frac{1}{2}^\circ$ in pitch can cause modest discomfort. Since blade track is considered a once-per-revolution event (the discrepant blade will pass a point once every revolution) it can adversely affect the balance, which is also a once per revolution event.

The "uncontrollable" aspect of propeller vibration occurs at the blade pass rate—the rate at which the blades pass a point in one revolution. You may notice this in a strong quartering tailwind. The accelerated air from the propeller is actually a corkscrew, and on a fixed point, appears as pulsations on the windshield, side windows, and cabin walls. As propellers age and get filed down thinner and thinner, the N per revolution (N being the number of blades) tends to be worse. With X amount of thrust shared among blades, this pulsing is more pronounced in a two-blade propeller, than a three-blade. The blade plan form also has a strong effect—elliptical and swept blades being generally smoother, in addition to better aesthetics, in my humble opinion.

The "correctable" part of propeller vibration consists of good propeller maintenance, proper build, and setup. Despite painstaking care in all these areas, there is one "no-see-'em" improvement—dynamic propeller balance. Dynamic prop balance measures the forces created by mass imbalance. Since the basic balance—the gravity balance that was done at overhaul —does not incorporate the running forces, the two can be quite different. The mean imbalance in the Yak and CJ series runs about 0.4 to 0.6 inch per second (IPS). An acceptable imbalance is somewhere between 0.15 and 0.2 IPS. With care, this number can be reduced below 0.05, or so, if all the parts are tight, and the prop tracks well.

What do these numbers mean? Well, at 2000 RPM, each 0.1 inch per second equals about .001 inch physical displacement. 0.001 inch equals 1 mil—like the mil thickness on yard trash bags. You can imagine how the prop would feel at 1.0 IPS (10 mils). Terrible! Most pilots can tell the difference between 0.3 IPS and a balanced prop. It depends on how much time you have in the aircraft, your experience flying different types of aircraft, how much partying you did the night before, and so on. Some pilots could not tell if the prop was out of balance unless they had to count the blades.

Instrumenting the prop consists of placing an accelerometer on the engine case, and setting up an optic sensor. A small piece of reflective tape acts as trigger for RPM measurement, and for setting a band pass filter in the analyzer. I won’t go into the vagaries of signal processing, but I will say, unless the filter is narrow and there is an ability to massage the reading a bit, the M14 engine gear ration will make it difficult to impossible to derive a signal in the older Chadwick analog balancers, and in some of the less sophisticated newer digital "cheap" balancers. As a rule, if the balancer is digital and has a vibration spectra capability, with hard copy print capability, it should be suitable.

The engine is run to temperature and readings taken at selected RPM. As an operator, it is important to repeat the RPMs as closely as possible, run to run, for the selected balance points. There are variations in the readings through the RPM range—you can’t mix and match and expect a planned approach. Kind of like flying the final approach with a different sink rate every time. You can do it if you are really good, but it is better to be consistent.
To balance, weights are placed on the hub or front spinner support, typically a few grams to several ounces. These are derived by making experimental weight changes to the propeller. Since every propeller responds a little differently, the response will similarly be different. The response to these changes is measured and a recalculation is made to balance. On a particularly bad propeller, this takes more engine runs than on a moderate imbalance. Oddly, fine tuning a close one also takes a few extra runs, because the changes are so small and the signals so weak, discerning a “true” response can be difficult.

These readings are often plotted on a polar nomograph. Some digital balancers do this internally, but any balancer worth its salt will default to the nomograph if there is a problem. It is a visual representation of the mass of the prop, and changes to it. A surprising amount of accurate troubleshooting can be done this way, often down to single parts!

The final installation of weights is done mechanically. This step is a make or break, sometimes literally. On the Russian props, the weights are fitted to the hub near the base of the blades. They are crescent shaped and are normally distributed asymmetrically on the prop. On the MT prop they are through-bolted on the front spinner support. They are not to be left on the outside of the spinner, and the use of stick-on weights is in the same league as duct tape for a structural repair.

In addition to balance, an engine spectra is often performed. This is a whole new area of discussion. Suffice to say it is useful from a health standpoint for the engine. It can be compared to others, and it can be trended against itself for component troubleshooting.

What to Expect
Smother operation. Most pilots notice the difference at idle power, and at low power settings in the pattern. The engine acceleration is also much smoother. There are power gains, to be sure, since it takes energy to create vibration, and if vibration is reduced, it translates into “free” horsepower. Perhaps the biggest gain is in the reduction gearbox and ancillary equipment on the engine. These parts are needlessly flailing with an out-of-balance prop, and last much longer in a smoother state. Oddly, it makes little difference to the prop itself.

Lastly, the balance does require a logbook entry. The balance should remain OK for approximately three or four years of average use, or approximately 400-500 hours. Obviously, if any major propeller work is done, or the prop or engine are swapped, a new balance will be required. ★
The Professional and Proficient Pilot

In my last Contrails article I discussed the benefits of keeping your aircraft in proper mechanical order, as well as the pitfalls of not doing so. In that article I also mentioned that there is another half to this equation, that of the professional and proficient pilot. Let’s explore this concept and discuss ways we can each make ourselves into just such a pilot.

Professionalism
What does it mean to be professional? I’m sure many of our readers are either former military officers or university educated businessmen. Just about any business oriented training program will define professionalism and describe the benefits of conducting oneself in a professional manner. Look at the following definition.

professional adj.
1. Of, relating to, engaged in, or suitable for a profession: lawyers, doctors, and other professional people.
2. Conforming to the standards of a profession: professional behavior.
3. Engaging in a given activity as a source of livelihood or as a career: a professional writer.
4. Having or showing great skill; expert: a professional repair job.

n.
1. A person following a profession, especially a learned profession.
2. One who earns a living in a given or implied occupation: hired a professional to decorate the house.
3. A skilled practitioner; an expert.

I particularly like the third bullet as a noun: A skilled practitioner; an expert. How many of you consider yourself an expert? How many consider yourselves skilled? If not, why not? Is it only the pilot with military experience or the most hours that we consider to be the expert? Can a civilian pilot, even with low time, prove himself to be a professional? I am certain you have all met such people as part of the RPA and other Warbird organizations.

Note the reference about conforming to standards. How many times have you heard someone say, “We’re not in the military” or watched someone who refuses to conform to standards such as those for FAST? Being professional does not take away from your freedom or ability to show your unique aviation personality. Rather, it is the precise, professional approach to what you do with an airplane that makes others want to be like you. Remember, imitation is the most sincere form of flattery!

As an air force commander, I used to tell my troops, “Being professional is about how you conduct yourself when there is no one looking over your shoulder.” We also used to say in the air force, “Train the way you fight, fight the way you train.” The point is not to have two standards. Do things the right way, every time, then you don’t have to remember to do something different when it counts, ie a checkride, etc.

Let me close out this subject with this observation: we had many demanding missions in the military. Risk was something we managed and mitigated, but never escaped. As civilian pilots flying Warbirds, you also have risk. You can’t escape it. Airshows, aerobatics, and formation all have their risks and rewards. If you don’t want to do any of the above then what’s the point of owning a Warbird. What is it we put in our annual program letters? “I am the owner of NXXXX, based at XXX, and plan to show the unique characteristics of this aircraft at the following events…”

Proficiency
When I flew A-10s in the ANG we had the exact same mission requirements as our active duty counterparts. We had to fly 36 sorties per half year. Our specific mission events included basic fighter maneuvers (BFM), low level, formation, instrument approaches, low and high angle bombing, low and high angle strafing, level and toss bombing, balutte retarded bombs (no snickering) and snakes, laser designated bombs, CBU, and Maverick missiles.

I’m sure I’ve forgotten some of the events but you get the picture. Every sortie had to count for something. There was no time to waste. Also, living in New England, winter sorties were often delayed or canceled for weather. So, you had to plan for 12 days each month in order to guarantee 6 sorties.

How many of you practice at least two to four times per month? What are our events? Aerobatics, formation, instrument approaches, and low altitude maneuvering. Let’s not forget pattern work: normal, no-flap, engine failure, short and soft field procedures.

The jet Warbird pilots are required to do an FAR 61.58 proficiency check every 12 calendar months or they cannot carry passengers. How many of you prop guys at least do an FAR 61.56 biennial each year? There are many maneuvers which are best practiced with an instructor or evaluator on board. Instead of looking at these rides as a risk, why not consider them an opportunity for you to hone your skills.

Here in the southeast, I get together with my RPA friends at least a couple times per month. BJ Kennamore, Jeff Dennis, Robert Langford and I are very comfortable with formation and airshow performance because we practice together every chance we get.

Remember that flying airplanes is a little more involved than riding a bicycle. Your skill sets are perishable and therefore need to be exercised on a regular basis. The older I get the more I shy away from doing silly things or taking unnecessary risks. I also work very hard to stay proficient. I flew 1800 warbird hours in the last six years, 1250 of them in jets. My commitment to being proficient is strong. I hope all of you share the same commitment to keeping yourselves safe, and upholding a professional reputation for the FAA and the public to see.

Fly safe and always remember to “Check Six” ★
I Bought a Complete Nanchang CJ6 off of Ebay for $20.80!

By Robert "Speedo" Genat

As a kid in the mid-1950s, I built lots of model airplanes. It was that post WWII/Korean War/Cold War era when the country was still savoring its Axis win and gearing up for the jet age with new, detailed plastic kits relegating wooden models to kindling. It was also an era where glue had an intoxicating smell for a ten-year old, but I didn't know why. As I grew into my early teens, model cars became my passion. I figured I'd never own an airplane, but someday I'd most certainly own a car.

In the early days Monogram and Revell reigned supreme in the model airplane world. But today, the Japanese, Chinese and several European manufactures have come forward to produce outstanding kits of aircraft other than the most popular military jets or warbirds. Trumpet is a Chinese manufacturer that makes two versions of the Nanchang CJ6—one in 1/32 scale and the other in 1/48 scale. Due to its larger size, the 1/32 version is highly detailed including a complete radial engine and fine cockpit details. Both versions include a color guide and decals for a stock Chinese military version. For those who want to build something different, a little searching on Ebay will result in three-bladed props, spinners and a large variety of decals to make your look CJ the way you want it to.

I built the 1/48 version in about a month of free time. I opted for my own agressor paint scheme of a light and dark gray with a black cowling for some visual interest. It was a fun project that required a steady hand, stronger glasses and some patients. I did lose a landing gear door and broke the wing step. Damn those small parts...

The CJ below was built by expert model maker Gary Wickham of Sydney, Australia. It's Trumpet's 1/32 version that includes much more detail than the 1/48 model, including moveable control surfaces and an opening canopy. Take a look at the build process of this model on Wickham's website: http://scalespot.com/onthebench/cj6/cj6_build.htm

My 1/48 scale CJ is not the quality of Wickham's build, but was a fun exercise. Building one of these kits would be a good way to experiment with a paint scheme for a real CJ without the expense of painting a real aircraft.

Finding either a 1/48 or 1/32 kit in a local hobby store is almost impossible. The best way is to buy one off of ebay.
Some 13, or so, years ago, the AirVenture cup race was established to revive cross-country air racing, which had mostly died out years before. The route changes, but the destination is always somewhere near Oshkosh, and the race ends on the day before AirVenture starts. I always thought that it could be fun to race, but the main obstacle was the limited fuel capacity of the CJ-6, especially with an M-14P engine. Previously, I had run my CJ-6 in several short races, with good results. Another motivator for racing was my anger over the hack job on the Nanchang, as published in the AOPA magazine.

This year, sub-classes for Yak and CJ-6s were added under the “Heavy Metal” category, and a “no penalty” fuel stop was allowed. Another factor was the starting point, which changes from year to year. This year the race started from Mt. Vernon, IL, which is just east of St. Louis, and close enough to my route from Florida to make the detour. The race course ran north, 364.8 NM to Wisconsin Rapids, and then turned east to Waupaca, for 35.3 NM, for a total of 400 NM. Oshkosh is approximately 30 SW from there.

So, I coughed up a $270 entry fee, which turned out to be worth three meals, some beers and a bus ride—I’m told more was available but details were never briefed. Administrative overhead got the rest I guess. Additionally, there was the hotel bill at Mt. Vernon and the fuel to get there. I had called ahead for hanger space, so I could prep for the race the day before. Then, there was plenty of paperwork, insurance certificates, waivers—all stuff needed to cover butt if something went wrong.

My problem—N285CJ ain’t what she used to be since I removed the performance engine, and sold my Crowder spinner to “Med.” He needed it to complete a Flying Tiger look on his CJ. Worked out great for him, but I ended up losing a bunch of knots. All I could do was tune the engine, tweak the trim tabs for 170 knots, and “race tape” the airframe in critical areas, such as joints. Throw in a few temporary fairings, a liberal dose of MMO in the fuel and engine, a wax job, and I was ready. The M-14P, with paddle blade prop, is stock, except for my electronic mag conversion, and my own spark-plug wire upgrade. A temporary induction ram air mod helped a bit, too.

After some testing and calculations, I figured my 14 gallon aux tank would provide a reserve to the 40 useable in the mains so I could run 200 NM at 80% power to make a fuel stop, factoring in a 30 mph headwind. It turned out to be a 12 mph headwind to the stop, so everything was good.

Lots of interesting airplanes and pilots showed up for the event, as well as a shorter race on Saturday, run by the Sport Air Racing League (SARL). Some big names in the business, like Klaus Savier of Lightspeed and a couple of Reno racers showed up, as well. The only airplane that looked comparable in size, weight, and performance, was a Comanche 400, piloted by a couple of young bloods, on their first outing. It ended up that I edged them by less than 1 mph.

The Race
A flying start was used—each plane departed single-ship, and then circled back over the start line at 1000 AGL, to clock the start time. My start was towards the end of the line-up, as my speed would be rather slow in comparison to the rest. The “rest” included 48 planes, most were...
Lancairs, Glassairs, canards, a couple of Turbine Legends, both a GP4 and the only GP5 flying, Swearingen SX300s, plenty of RVs, and an odd assortment of factory-builts.

My start went well, and soon I settled in on the 356° heading, and spotted a few guys up ahead of me in the clear air. Playing with the shutters, oil cooler door and trim, I finally found settings I was happy with, trueing out over 200 mph, and getting 190 mph ground speed at 1200 AGL. RPM was set to 2400 and throttle WFO, burning 23.5 GPH. After a while I spotted what looked like big white birds, same as we see in Florida. Those birds kept getting bigger, and soon I was passing some airplanes. One VariEZ had a sick E-Mag, and the Diamond was just slow. A few more planes passed under my wing and at the halfway mark I overflew the fuel stop at Dixon, IL to stop the clock, and landed.

So far, so good, but now Murphy joined in the fun. The re-start was never really briefed in detail, because all the SARL guys knew how it worked. I turned back on the direction I came from to gain altitude and airspeed for the in-bound restart leg. As with the previous start I called in at two miles. The reply I got was that the clock was restarted as I was supposed to call in over airport center. My protest was in vain since the timers were sitting approximately ¼ mile from airport center at that time, and all they had was the radio call to mark. Oh well, what's an extra two miles, anyway.

Northern Illinois terrain slopes up a bit towards Wisconsin, over some ridges, and now there was a ceiling at 1100 AGL, with stronger winds as well. Bumpy air resulting from wind flowing over the glacial mounds added to the sensation of speed. As the Wisconsin Rapids Airport turn came up, I spotted an RV ahead, about ¾ mile, but I lost him in the turn—tough bugger to spot under a gray sky.

The east-bound heading was better—ground speed went up to more than 200 knots and it all seemed downhill. Approximately three miles out, I heard the RV calling in at the same distance as I was, from the finish. At 200 knots there was only seconds to sort out where he was, so I lowered my nose to look. As I crossed the finish the RV shot upward from under my nose to a pitchout 50 yards in front. Surprise is understating the effect. Hmmm, that was a lot lower than the briefed arrival. I followed him for a bit, waiting for his in-bound turn but it never came. A radio call confirmed that he was not stopping there for the cheap gas so I turned back.

As I taxied up at Waupaca, the line boy must have figured I was a transit and not a racer so he parked me away from the line at the pump. By the time I got it sorted, I was next-to-last for fuel. An hour and a half later, and I was off for Oshkosh. It was neat to overfly the field at 3500', and then slice down into the warbird arrival through smooth air at 190 knots. Sunday afternoon and the North 40 was almost full, and the South 40 filling up. After approximately five unanswered calls, I gave up calling tower, and headed in for an overhead break. Tower spotted me and had called a mid-field break to sequence on the downwind.

Later, a rented bus took all of us down to Wendt’s, on the lake, for dinner. Really good local beer was furnished, and I had a great piece of fish to wash down. At the awards ceremony, my first leg time was clocked at 191 MPH, and numerous folks were surprised a CJ-6 would go that fast for such a distance. Perhaps they believed what they read in the AOPA "fly-off?"

Later, my time was re-adjusted to 187 MPH overall—my two mile screw-up, and headwinds, took their toll. My award? Well, first place in Heavy Metal. I have been explaining that I also placed second and third, since I was the only entry. So, now the bar is set, since this was the first run of a CJ-6 in a SARL race. The SARL Heavy Metal Yak class record is 116 mph in a Yak-52. Come on guys, I know you can do better than that.

Met many interesting folks, as well, and picked up some speed tricks too. The 2014 race will start from South Dakota—I’ll pass on that and the race won’t be back at Mt. Vernon until 2015. Maybe some other Red Stars could show up, as well? Meanwhile I’ll be organizing a 40-mile sprint during Sun ‘n Fun 2014, and Red Stars are welcome to compete, since I can’t oversee the event, and run the course at the same time. ★
BARREL ROLL  

The traditional barrel roll employs a 90° offset reference point such that, at the inverted position, the aircraft heading is 90° from the entry heading (top figure). There are times when the 90° offset is not desirable, such as during an airshow, when the performer is confined to an aerobatic box, or cannot direct energy toward the crowd. In these situations, the offset can be modified to something less than 90° (bottom figure).

In theory, the barrel roll is a graceful, one-G maneuver. There is continuous, coordinated change in both pitch and angle of bank once you start the roll at 20° nose up. Since you never pull more than one G, this also makes it a good maneuver to demonstrate to a passenger who would like to try aerobatics, but has never experienced inverted flight or high G loads.

Bob Hoover produced a well-known video where he demonstrates the one-G phenomenon by pouring a glass of tea, while rolling a Shrike Commander. You can see the video by following this link: http://www.youtube.com/watch?v=uw2qPLEgKdQ
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