



# EAA602 Log Book

Adirondack Chapter Newsletter

April 2008

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HOMEBUILDERS



## From The Presidents Desk

by *Tim Couper*



Well, the longest Winter on record is finally coming to a close. I wish I would have had more days to fly on skis, but things never seemed to work out right. Richie... next year we'll have to do a better job keeping the hangar doors from freezing to the ground!

Thanks to Ken Sherwood for his excellent presentation on survival at the last meeting. And, congratulations to Ken and Bill for their new adventure taking over the FBO at FulCo! What a great opportunity for the 195 Factory, and hopefully an infusion of fresh excitement into the local aviation community.

Thanks to those who have stepped-up and submitted articles for our great newsletter! I am so impressed with the quality of writers we have in the club. I get compliments all the time from readers, and I tell them that it's because we have some great people who are willing to take their time to share their aviation experiences, in writing. I know it's hard, especially if you don't express yourself on paper very often. It doesn't matter how limited your writing experience is. It's your aviation story that we're interested in, not your grammar. Try it, you might like it, and it can be very rewarding. Ask any of those who have already had articles published.

This month's meeting will be at the Edinburg Town Hall at 7PM. We have much to talk about. After the business part, Larry will be giving a follow-up presentation on weather, only this time he claims that we'll actually be able to understand it. I'm sure it will be great, and Larry has guaranteed me that there will be neither Greek symbols used nor any Calculus formulas!

*Tim*

**The Meeting This Month Will Be At:**

**Edinburg Community Center @ 7:00pm on Mon. Mar. 30<sup>th</sup>**

## Upcoming Events

**Mar 29-30  
Glider Ground School  
Ballston Spa, NY, USA  
For info go to  
[adirondacksoaring.com](http://adirondacksoaring.com)**

**May 24 - EAA 602 Annual  
Poker Run, 1F2 Edinburg**

**June 28  
EAA 602 - Kenny Schleich  
Memorial Fly in BBQ,  
NY37 Galway**

**July 10-13  
Green Mountain Aerobatic  
Contest Springfield, VT  
For info go to  
[www.idc35.org/  
contests.html](http://www.idc35.org/contests.html)**

**July 28-Aug 3  
AirVenture - Oshkosh  
Anyone planning on going,  
contact me and we will get  
together in the campground**

**August 9  
EAA 602 & UL 90 Young  
Eagles Day,  
NY0Fulton County Airport**

**September 6 - Old Time  
Taildragger Fly-in,  
OHY7 Murphys**



## Cross Country by T-6

*by Mark Murphy*

Last month I wrote an article on my delivery of the AgCat to South Carolina. Since a lot of people enjoyed the story, I was encouraged to write about the trip Dad and I took to pick up the North American T-6. Since I am no Ernest Hemmingway, I will do my best.

For years I have always dreamed of owning a warbird. The dream came true about two years ago in May 2006. I had been looking at T-6's for about a year. I looked at a couple but for one reason or another they did not work out. This one was advertised in Trade-A-Plane. When I saw the ad it seemed too good to be true. It was a low time, with 100 hours on the engine and fresh paint. It was reasonably priced so I called on it. When I saw the pictures it was beautiful. Dad and I made a deal over the phone and I sent the owner a deposit. Now we had to get the plane from Mojave, California to home. We checked the weather and picked a good week to make the trip. Dad and I flew my Bonanza to Warsaw, Indiana to drop off Diane, my wife and the kids to visit with her family, while we were gone. The next day we flew on a one way commercial flight from South Bend, Indiana to LAX. When we arrived in LAX we felt like celebrities when we got off the plane. There was a man in a black suit that had a sign that said "Murphy". Wow, that was us! The limo driver took us to meet Jack and Maggie Watson, the owners of the T-6. They treated us to a wonderful dinner in LA, and Jack told us that he owned a company that made the explosive for air bags. He has done well for himself and was extremely kind and generous. After dinner they gave us the log books to look at that night in the hotel. Good bedtime reading material!

The next morning Jack picked us up for the hour and a half ride to the Mojave airport. The airport had several neat things to see and do. Dick Rutans scaled composite airplanes (Spaceship One) had his headquarters there. As we looked around we saw that Arnold Schwarzenegger's helicopter for the movie True Lies was there. We saw a beautiful restored Antonov AN 2 biplane. In the hangar with the T-6 were several jets and Huey helicopters. We could have stayed there all day to look around but we were on a mission.

The T-6 was better than the pictures and after looking it over we decided to buy it. Dad took care of the paperwork with Jack. It took about an hour to get the plane ready with our bags, 2 GPS's, a power plug, and a hand held radio. The plane was now ours so I put the finishing touch on it. I gave it the name "Sweet Diane", after my sweet wife, Diane! I bought a decal with me from New York and put it on the side of the plane. With everything complete we were ready to start the plane and have Jack check us out in

it. The bad news; Jack had not flown the plane recently and was not comfortable taking me for a check out ride. Dad and I discussed what to do next. Neither one of us had ever flown a T-6 before. Jack did not know anyone in the area that could check us out. We decided that as long as we learned the "systems" and felt comfortable with the "mechanics" of flying the plane we would head home with it. Jack went over the operation of the airplane gear, flaps, hydraulic system, fuel, and power settings. We were ready to go and I decided to fly it first. Dad was in the backseat reading me the checklist. I taxied to the runway and got clearance to take off around noon time. "Well, here goes nothing", I thought and slowly advanced the throttle and the plane accelerated down the runway. The plane went right down the center of the runway and lifted off smoothly. I pulled the gear up and pulled back the power to 30 inches mp. There was no traffic so I asked the tower for a low approach, as we flew down the runway Jack waved farewell. I pulled up and banked to the left to say goodbye.

Dad and I were on our way home with our new plane. I called Los Angeles Approach and found out our transponder was not working. I was disappointed because I like to have flight following, especially since we were going from LA to NY. We headed to Blythe, CA about 150 miles away from Mojave, CA. The engine temperature was running in the high green, the weather was clear, the winds were mild, and I was flying high with the thrill of flying a warbird. We arrived at our first stop and Dad read the checklist to me for landing; fuel full tank, gear down, mixture rich, prop forward, flaps down, 100 knots. On short final we slowed to 90 knots, about 20 feet I started to flare, and then touched down, and a smooth rollout. It was great feeling as we taxied to the pump. Shutting down the plane the first leg of our trip was over with. It was so hot it was hard to breathe when we got out of the plane, or maybe it was because I was so excited. The plane was topped off and the fuel burn was calculated to be about 32 gph.

Dave, my dad, flew the next leg to Tucson, Arizona. He is a seasoned taildragger pilot and had no problem handling the airplane. We made our way to Tucson and landed safely and as we taxied to the ramp there were several derelict warbird lined up, which was sad. We had an ice cream at the airport while we were fueling up and decided our next stop would be Deming, New Mexico. I flew this leg and it was a very normal flight, everything was going smoothly. We decided to call it a day in Deming as we had put in a full day of flying. We were thrilled that everything had gone so well on our first day of flight. We hoped the rest of the trip would go as smooth, but this would not be the case.

*To Be Continued Next Month*



## New Adventures

*by Tim Devine*

By the time that most of you read this we will have all checked off the official first day of spring on our calendars and will be anxiously awaiting the runways to dry out so we can start the 2008 flying season. Memories of this past long winter will hopefully be just that.

But this past winter afforded me the opportunity to try a whole new dimension of our sport, winter flying on skis.

One of the great things about our chosen hobby is that there are always new experiences and adventures to challenge us and make us better builders and pilots.

I had toyed with the idea of putting the Champ on skis for the last two years, but with a son in college and limited funds it was definitely not a high priority item. If it wasn't for the great wealth of resources that EAA 602 chapter members have to offer I could have never made this happen myself.

Just to test the waters I put a note in the want ad section of the January newsletter seeking skis for a Champ. At the time I did not realize that Tim Cowper electronically sends our newsletter to the presidents of other NYS EAA Chapters. So on Saturday morning January 12, before I had even read the January newsletter, I was surprised to receive a phone call from Mr. John Morrow who is the President of the EAA Chapter based at the Kingston Ulster airport. Mr. Morrow is a CFII/ATP/Master Flight Instructor with a really nice little grass strip and float plane set up on Esopus creek just North of 20N. John had already read the January logbook and had a set of skis that he was interested in selling and they were already rigged for a Champ. I met with Mr. Morrow later that week and except for being a little dusty the skis were in excellent shape.

Well news travels fast in 602 so many people already knew that I had found skis by the time we had the Sport Island pub fly in. At the fly in I was able to examine some of the aircraft and how they were rigged to accommodate skis. During lunch I was able to pick up some pointers from seasoned ski flyers that helped to answer some of my questions about ski operations.

The next members of 602 to step up to help me were Roger Johnson and Tom Kravis. At our January meeting at Murphy's hanger Roger presented me with copies of the original Federal Ski Company installation and rigging instructions for mounting their skis in a Champ. Tom Kravis then handed me the necessary mounting brackets to connect the bungee and safety cables to the aircraft. This gave me all the information and parts that I needed to get started. After purchasing the necessary longer AN bolts to accommodate the mounting brackets it took me about 4 hours to mount the skis. My next dilemma was how was I going to move the champ around now that it

was sitting on skis that were riding on two piano dollies. With the number of airplanes in the hanger there just wasn't going to be enough room to maneuver the Champ around.

The final member to help me out was Doug Sterling who decided to fold the wings on his new Glastar which now would allow me to pull back into the hanger, slide the dollies back under the skis and pivot the Champ 180 degrees so it could go tail first back into the hanger and be ready for another day of flying. I was good to go!

Sunday February 17 is overcast but high ceilings. The temp is 25 degrees and there is about a 7-knot breeze right down 24 so I'm going to give it a try. After pre heat and all the other wintertime rituals I am ready to go. I'm a little nervous as I haven't flown since November and I have never flown on skis. The local snowmobilers have been up and down the runway enough that it is sufficiently packed down but I don't know how the skis will handle the tracks. I decide that I'm going to taxi around to get a feel for how the airplane handles on skis. In front of the hanger beyond where its plowed the snow has about a one inch thick crust and is soft underneath. On wheels the Champ typically taxis nicely at 900- 1000 RPM. 1200 RPM has me wallowing over the crust, breaking through and kind of shimmying along. I decide to try 1400 RPM with the stick full forward. What a difference! The airplane gets up on the crust and is now taxiing along nicely. I am amazed at how easily it turns and I make several runs up and down the field trying different power setting and techniques until I feel comfortable.

It's now time to launch and after a rolling run up I taxi back to the threshold of 24 and give her the beans. I had forgotten how much airplanes love the cold air and with the 85HP Continental and a climb prop I am off in no time and climbing briskly. I pull the throttle back to 2250 as I pass over the trees at the end of 24 as I have already reached pattern altitude. I stay in the pattern and get set up for my first landing on skis. The AC is a little more nose heavy with skis than on wheels so I trim accordingly. Everything about the landing is identical except for the depth perception, of which there is little, and the clatter of the skis when you land. I pull off to much power and stop almost immediately. My next two landings I add power after landing and find that transitioning to taxi is quite easy.

I spend the next two hours doing touch and go's on the lake and buzzing ice shanties and then headed back to the barn. I get the Champ successfully up on the dollies and back in the hanger and make note in my logbook. Champ 7DC from 1F2 to 1F2, duration of flight 2.5 hr, notes first flight on skis!

Subsequent weekends included flights to Jack Schliecks, Argyle, and Mohawk Valley, which has someone

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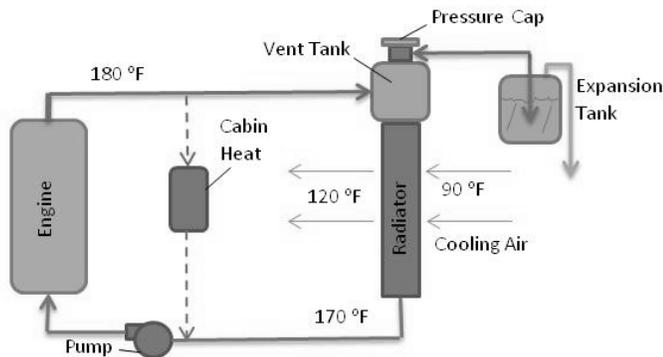
## Keeping your cool in the Air!

(Conclusion) by Larry Saupe

This is the final part of a several part series dedicated to heat transfer. In case you were wondering, Part 3, which was dedicated to radiation heat transfer, never made it to the newsletter. By the time the article was written it was unfortunately too large for the newsletter format. It will be placed on the website for those interested in reviewing it, or you can contact me directly.

This final part will cover troubleshooting of an overheated cooling system. When trying to determine a cause of an overheating engine cooling system it is important to keep the big picture in mind as to what we are ultimately trying accomplish with this system. The goal is to cool an engine by rejecting heat to the ambient air. For an air cooled engine this happens directly, but for a liquid cooled engine this is a two step process. First we transfer heat from the engine to the coolant (usually water or water/glycol mix) and then from the coolant to the air (using a radiator). Figure 1 shows a depiction of a typical liquid cooled engine installation.

Figure 1: Typical System Arrangement



Often the weakest link in the system is performance of the radiator. Recall that performance of the radiator is influenced by both the water side and the air side. The radiator will have its highest capability when each side (water side and air side) have equal authority. So... if say the water side readily wants to transfer heat to the radiator, but the air side cannot take it away (say from fouling or low air flow), the heat rejection will be diminished and the engine will overheat. In this case the metal temps (tubes and fins) on the radiator would be very hot. In the opposite case, if the air side was performing well and the water side was not performing well (as would happen due to low flow, fouling or trapped air) the engine

would still overheat but the tube and fin temperatures now would be rather cool (much cooler than design). If we could measure the radiator temperatures (on the heat transfer surfaces) this would give us a quick clue as to where the problem was (air side or water side). Metal temperatures will gravitate toward the temperature of the highest performing side.

If we can't accurately measure these temperatures, what quick tests could we do to determine the problem? As previously mentioned, a happy heat exchanger is designed for equal thermal authority on each side. When one side starts to fail, performance will become very sensitive toward any changes on the failed side (as this becomes the thermal limiting "bottleneck" portion of the system). It will also be rather insensitive to the high performing side in this scenario. This response allows the user to try a few quick things to see which side is thermal limiting.

We have an overheating engine (as indicated by high water temperature). The first thing we want to try is to change the performance on one side of the exchanger and see how the cooling system responds. Often the air side is something we can quickly check. If we partially change the airflow to the radiator, do we see an immediate and proportional response (say by increasing airflow or partially restricting it)? If so, we most likely have a problem with the air side. If we see only a slight response, the problem will most likely be water side related. Changing performance on the water side is not as easy as the air side, but can be accomplished. Anything that would alter the water flow rate would be effective. If you have a cabin heating system you could momentarily restrict the flow to the cabin heat which will then send more to the main radiator. If you see engine cooling improve to this change you most likely are water side limited etc.

Once we determine which side is limiting, what do we do next? If it is the air side, we need to look closely at the cleanliness of the radiator, and also the full air flow path to and from the radiator. The flow path downstream of the exchanger is just as important as the upstream side (if not more so). It is not uncommon to see elaborate ducting to bring air into a radiator, only to see large restrictions downstream to nullify most of the upstream work. It is also very important to try to discharge the air from the radiator into a low pressure region of the airstream.

If we determine our problem is on the water side, we next need to determine if the loss of performance is due to fouling, plugging, entrapped air or low water flow. The hydraulic design of the piping which carries the coolant from the engine to the radiator and back is crucial to allow radiator performance to be at its best. Ultimately we want the highest possible flow rates and also a system which will allow for automatic purging of any air that enters the system.



When reviewing or installing your system imagine yourself as a bubble of air trapped in water. Are there any places along the flow path where you could be trapped and not float upward and enter the vent tank? If so, it most likely will happen. Heat exchangers typically have the inlets on the bottom with the outlets at the top to aid in purging any trapped air. An exception to this would be a vertical radiator with a vent tank located directly on the top (as is often the case in older automotive applications). Any air that passes into this style of radiator will collect directly in this integral vent tank before it enters the radiator tubes. It will then get pushed overboard into the expansion tank when the system heats up. Failure to remove air results in heat transfer surfaces not getting proper heat cooling/heating and also creates an overall restriction in the flow path which lowers the main coolant flow rate (double whammy here).

Close attention should be paid to the hydraulic path the coolant takes from the engine to the radiator and back. Each engine water pump has a specific performance curve and is designed for a maximum allowable back pressure (maximum line losses). Exceeding this value will quickly render a system ineffective. Care should be taken to ensure that the coolant line sizes are not undersized and do not contain any unneeded length or bends. Directional changes cause very high hydraulic losses and should be kept to an absolute minimum. A single 90° elbow can be equivalent to many feet of straight tubing. A few 90° degree elbows in a run may make for a nice looking and neat package, but the penalties imposed by the flow restriction may be more than the system can handle. All is not lost though. If these items are needed, line sizes can often be increased to allow for less restriction. One last item in the coolant path, which effects performance, is the water pump. Pumps often lose capacity as they age. A close inspection (or replacement) of this item yields high dividends whenever maintenance on the cooling system is being performed.

An area often overlooked in the cooling path is the flow rate of auxiliary coolant flows. If say the cabin heater is flowing much more coolant than the system was originally designed for, flow that was intended to go to the radiator actually bypasses the radiator (through the cabin heater) and sends the heat right back to the engine. I ran across this once when a cabin heater had been bypassed using a very short hose (the cabin heat exchanger was leaking and this seemed like a quick fix). This bypass circuit had much less restriction than the original cabin heating system. This allowed for a much greater amount of coolant through the bypass circuit, ultimately overheating the engine.

Here are a few interesting troubleshooting examples I was involved with.

### **Overheating snowmobile engine**

A friend of mine was into lake ice racing. Due to the limited snowfall the sled started running a bit hot owing to the lack of snow against the tunnel coolers. He decided to add a radiator at the front of the sled. It was a properly sized heat exchanger and had been successfully used on similar model sleds. When he installed it, the sled now overheated much worse than without it! He made sure his air path was good, but still the sled overheated. As the air side was in good shape we decided to look at the water side. A quick inspection yielded two important observations. 1. The exchanger (which did not have an integral vent tank) was piped with the inlet on the top and outlet on the bottom (high possibility to trap air). 2. The piping to the new exchanger was excessively long and included many 90° short radius elbows (resulting in excessive pressure drop). The system was re-piped in about an hour and the overheating problem was alleviated.

### **Overheating V-8**

On another occasion a friend had a small block that was overheating (as evidenced by high water temperature). As he hoped increasing the water flow rate would help the situation he removed the thermostat. This resulted in even higher water temperatures! How could this happen?? Doesn't increasing the water flow rate make the water side of the radiator more effective?? The answer is yes it does. But... it also makes the heat transfer from the engine to the coolant more effective as well (must never forget that the engine also behaves as a heat exchanger). In this case, the air side of the radiator was the root cause of the original overheating. When he increased the water flow rate the ability for the engine to give heat to the coolant increased, however, the radiator couldn't get rid of the added heat effectively owing to the poor air side performance. As a result the water temperature increased. A point to keep in mind is that water temperature is just that, water temperature. We use it to infer how the engine is doing. In this case, the engine internal metal temperatures were most likely slightly lower (than before the thermostat was removed) even though the water temperature had increased. This might seem like an odd concept at first. Had the original overheating been due to a water side issue (instead of an air side problem) the engine coolant temperature would have actually lowered when the water flow rate increased.

Hopefully this series on heat transfer has been somewhat beneficial to your applications. If you have any questions or if I can provide any additional information please feel free to contact me directly.

## New Adventures Continued

new operating the diner. Each weekend has also been a new learning experience. While the Champ still fly's the same I have had to learn new techniques for take offs, landings and taxiing. I am learning a lot about snow conditions and how they affect the performance of the skis. While a clear sunny day with bright blue skies would seem like a no brainer to go flying, once the temp gets above freezing and the top layer of snow gets wet and heavy the AC really has to work to just taxi. I found out through a ski flying website that it helps to wax the skis or spray them with Silicone for spring weather flying.

According to a number of ski flying web sites the ideal way to go is to cover the bottoms with a plastic coating of some sort. Some people have also had the bottom of their skis treated with spray on bed liner without the pebble material and say it works fine. Looks like this summer will be spent investigating which treatment works best and

then prepping for next season.

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On Saturday March 22 I head up to the airport with hopes of getting in one more day of ski flying. With the days getting longer and the sun traveling higher in the sky the snow has started to go and I know my Winter flying days are numbered. When I arrive at 1F2 to my dismay there is a twenty-foot patch of water and mud directly in front of the hanger that I will need to cross to get to snow that still covers the field. Looks like my ski flying days for this season are over. It's a nice day so I came prepared to work so I jack up the airplane remove the skis and put the wheels back on and get ready for spring. With a little luck hopefully the snow will go quick, the field will dry out and we can all get flying again soon.

But for now I'm just happy that I was able to get in some great ski flying this winter and keep my piloting skills tuned up for the coming spring season.

## Notes From Your Editor

by Doug  
Sterling  
863-2409



Well - here we are - another month and still looking at snow on the runway. GLOOOOM. This has to end soon I guess. Bruce Brownell (owner of the airport) told me that the ground is almost always cleared off by the beginning of April. I hope he's right or I'm going to go crazy. All I can think of is getting my new bird (GlaStar) in the air again before the price of fuel becomes out of sight.

I've been able to get fuel flows down to 7 GPH at 130 MPH. I guess I can live with that, but the thought of \$5 plus av gas is scary. Got to keep running on Mogas as long as I can. Remember to keep checking for methanol in your fuel EVERY TIME YOU GET GAS FOR YOUR BIRD. Don't take chances, this is important for the health of your fuel system & powerplant.

I'm almost ready to start the final coat painting on my Pulsar. Put the filler on and sand it off than repeat it a few more times. 90% ends up on the floor. What a pain in the rear prepping the fiberglass for paint. I'll never get another fiberglass plane unless it's gell coated first.

O-Well enough blabbing, time to get back to work - summer is coming soon - I hope. See you at the meeting Monday.

*Fly Safe, Doug*

## EAA602

819 North Shore Rd  
Hadley, NY 12835



GOD BLESS AMERICA  
September 11, 2001  
We will never forget.

April 2008

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