



January 2019 Newsletter

Knoxville TN AMA #594

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KCRC Meeting Minutes 12/11/2018

OLD BUSINESS

The December 2018 KCRC meeting was held on the 11th at Fellowship Church, 8000 Middlebrook Pike. President Ed Dumas called the meeting to order at 7:04PM. There were 27 members in attendance.

The November regular meeting minutes were approved by unanimous voice vote.

Michael Catlin gave the Treasurer's report which was accepted by unanimous voice vote.

Field Officer John Basalone had nothing to report this month.

Safety Officer Denny Evans had nothing to report this month

Ed Dumas reminded all holders of handicap permits that to have the privilege of driving their vehicle up to the flight line for loading and unloading, the sticker must be documented with the club Treasurer. To satisfy this the permit holder may provide a copy or photograph of the handicap sticker, license tag or registration showing the permit holder's name and expiration date.

2018 Elected Officers

Pres.....Ed Dumas.....ed@eddumas.com

Vpres.....Paul Funk.....paulfunk24@gmail.com

Secretary.....Roger Kroodsma.....jrt1953@gmail.com

TreasurerMike Catlin.....catlimi2000@yahoo.com

Executive Board

Randy Philipps.....randy@accesssolutionsinc.com

John Basalone.....jrbfarm@yahoo.com

Safety Officer

Denny Evans (Pending).....evans9633@bellsouth.net

The ballots for the KCRC 2019 officers were tallied and Ed announced the results:

President: Ed Dumas

Vice President: Paul Funk

Secretary: Roger Kroodsma

Treasurer: Michael Catlin

Board of Directors: Randy Philipps, John Basalone

Gene Waters presented a piece of KCRC historical memorabilia – A poster advertising a KCRC airshow to be held on Sunday August 29th. Although the poster did not state the year, it was ascertained that it was most likely 1982.

Ed announced that a meeting by KCRC officers Ed Dumas, Randy Philipps, Paul Funk and Denny Evans with the new Knox County Director of Parks and Recreation, Mr. Paul White, on November 14th, went well. According to Ed, Mr. White stated that the county has no current plans that would jeopardize KCRC's use of its current site. Mr. White also stated that he is pleased with KCRC's outreach efforts to garner even more community involvement in the club.

Randy Philipps reported Mr. White expressed particular interest in the "Fun Day" KCRC hosted last summer for a church youth group which was headed up by Denny Evans.

Randy reported that he has been in touch with the ORAU people that sponsor a student group, regarding coordination with them on drone events. Randy is also talking with a couple of RC car racing groups. One is Mr. Billy Kear with "RC Army" and him assisting us in designing a RC Track. Randy also mentioned that HobbyTown is willing to help us promote a RC Track if and when it happens. Paul White suggested the county might help KCRC to build a car track in the field on the South side of the runway. Randy also volunteered to research insurance issues regarding running surface vehicles at KCRC.

Paul Funk reported that the drone racing group in KCRC, headed up by Kevin and Evan Turner, have not been out recently due to weather and other obligations.

The indoor fly-in, previously set for December 14th, must be rescheduled due to a schedule conflict at the host facility, the K-9 Center. A new date will be sometime after the 1st of the year and will be announced at the January Banquet meeting.

NEW BUSINESS

Ed recapped the previous discussions that the club has had regarding reducing the number of regular club meetings from monthly to 5 per year including the January banquet. A vote was taken, which passed unanimously to reduce regular scheduled club meetings to:

January (Banquet); March; June; September; and December

Ed reminded all to please be courteous to others at the field.

Paul Funk cited a magazine article which said that drones (eg: multi-rotors RC aircraft) pose a significant and ever increasing threat to manned aircraft.

Paul suggested that KCRC members should advocate safe drone flying and adherence to all regulations to anyone flying drones whether or not they are club members.

Ed announced that the annual club Banquet will be held at the Golden Oak in Oak Ridge as it has been for several years. The date will be January 8th, 2019 at 7:00PM although members will likely start arriving around 6:30PM.

There were no Model of the Month entries.

There were no Crash of the Month entries.

Respectfully Submitted,
Rick Thompson, Secretary

A couple of notes on the minutes.

If you attended the December meeting you would have heard that KCRC is trying to extend our 'community outreach' by adding an RC car racing course. Until I visited the ROCCK racing track by the Knoxville Zoo I wasn't too sure as to what was involved. This Saturday (Dec 15) I visited the track and took some photos and video (and sound measurements).

Some technical details. The ROCCK club sets up the track after the fair in October and takes it down in March or April. The club does all the 'heavy lifting' by bringing in earth moving equipment to make the raised portions and the jumps. They also install the lap counting system which consists of a wire loop under the starting line and each car has a transponder. Software running on a lap top counts the laps, measures lap times and keeps track of the car's position in the race.

When I asked where they race or practice during the 'off season' months I received a variety of answers. South Carolina, Chattanooga, Cookeville, etc. So just having a practice track would probably draw members. Hey, they probably would build the track (with park district approval). One racer also talked about a 'carpet' track surface for unsheltered dirt surfaces.

As for the noise, the electrics ran about 65 to 70dB and the loud speaker was louder. The nitro cars ran at 80 to 87dB and that sound level may have been amplified by being under a metal roof.



The idea is not to turn KCRC into a model car racing club but to preserve our use of the field by showing increased use of the park district property. This is the reason for including the drone racing people. If the property is used by more than a handful (you know who you are) of people for a couple of hours a day and on weekends we stand a better chance of remaining.



Bringing the race car people 'into the fold' is much more complicated than inviting the drone people. The drone racers already have an AMA membership and insurance as well as a parent body. The race car people have an existing club(s) and parent body but it will remain to be worked out as to the times and conditions for the use of the field. Perhaps, the track would only be used for the summer months when the under cover venue is unavailable. Many more details need to be worked out and time will tell if it is a viable pursuit. If KCRC cannot work out a solution we risk having the park district work out one for us.

As to the drones, the current racing course is not being used due to the season and due to the drone racers having needed to move the gates to an event in another location. John Basalone has researched the costs of gates and for only \$13 each gate and a donation (also by John) of tubing KCRC can purchase gates and can have a permanent racing course available for club members.

By now you might have noticed that the layout of the newsletter has changed from portrait to landscape. At the meeting I asked who still prints out the newsletter to read, when I didn't get a reply I asked who reads it on a monitor. The number that replied indicated that the landscape format would be the best as this format is easier to read in electronic format. If you disagree, let me know and I'll take your comment under advisement.

As part of "community outreach" I have sent out an email asking for people to post fliers and club activities at your local library. To post a flier, one only needs to take it to the library staff and ask for it to be posted. The flier will be posted for 2 weeks only and then be taken down. Fliers NOT posted by the library staff will be taken down immediately. Several people have already committed themselves to post at various libraries.

Halls	Michael Catlin
Fountain City	Michael Catlin
Cedar Bluff	Ed Dumas
Bearden	Ed Dumas
Farragut	Stephen Jones
Lenoir City	John Basalone
Loudon	John Basalone
Kingston	John Basalone

If you wish to be added to the list just email me and let me know which library you will be posting at. If we have duplicates (a good thing) I'll try to evenly distribute the work load.

Now all we need is someone good at generating flier artwork. All my stuff looks like it was drawn by a 3rd grader on a good day.

Article of the Month

I was going to continue on with part 2 of lofting with conics but I got involved with the election (club) and with various pre-holiday events. I was able to read a very good book on the Spitfire and the Bf-190 and I would like to end by sharing some information about the Spitfire.

The book is "Dogfight: The Supermarine Spitfire and The Bf-109" by David Owen and presents much more information than I have space for here.

In 1934 the British RAF received a rude surprise in the form of the Bristol 135 a 6 passenger airliner with a crew of 2. The Bristol 135 soon was improved into the Bristol 142. Why the surprise? The Bristol could do 240 MPH, almost 50 MPH faster than the current British fighters. The aircraft also featured the new Hamilton-Standard variable pitch propellers which allowed for short take-offs as well as a high speed cruise.



During the first World War London was bombed at night by Zeppelins as well as biplane bombers and were very difficult to stop. If the bombers could out run the fighters it would be impossible. And, Nazi Germany was on the rise again.

Why were fighters so far behind in performance? Front-line fighter squadrons, like those of France, Germany and the USA, still depended on planes all too familiar to pilots of 1918. They were happiest with an open cockpit for the best possible view of the skies around them. They wanted maneuverability to dodge enemy fire and bring their own guns to bear on a fleeing opponent, which meant the low wing loading of a biplane. They wanted the supreme simplicity and reliability of a fixed undercarriage, and they wanted the familiar armament of a pair of machine guns mounted within easy reach on the engine cowling in front of them. Their tendency to jam in combat could be tackled by a hammer carried in the cockpit. Fighter pilots' preferences made failure inevitable. The drag caused by an open cockpit meant the only view it was likely to give was of a monoplane bomber disappearing into the distance. Pilots insisted the inherent maneuverability of a biplane was essential in fighter-to-fighter combat. Their large wing area enabled biplanes to roll more quickly and turn more tightly in a dogfight. So long as fighters were evenly matched, designers had little incentive to explore new ideas, but now the game was well and truly up. Something had to change.

Change was coming. In October 1925 in Baltimore on the shore of Chesapeake Bay the Supermarine S4 seaplane made its appearance. Slender with a high wing, powered by a 700 HP Napier Lion engine. The challenge, win the Schneider Trophy. The aircraft was designed by Reginald Mitchell who apprenticed making steam locomotives. He then moved on to Supermarine designing flying boats.

Why seaplanes for speed racing? It was because the variable pitch propeller hadn't been invented and with the propeller pitch set for high speed acceleration was dismal requiring long runways that also were not in existence. Except for the surfaces of lakes or bays.



Solving problems of high power and high speed would teach all kinds of lessons, some of them entirely misleading. Taming torque reaction, eliminating wing flutter and coping with excess heat emissions all lead to the Spitfire's design.

In October 1931 the Royal Air Force (RAF) issued specifications for a new fighter design.

With the British aircraft industry in recession, new work was welcome and his design joined a bizarre mixed bag of competitors. There were twelve initial entrants, six biplanes and six monoplanes. Armstrong Whitworth entered two; the AW21 monoplane and the AW35 Scimitar biplane. The Blackburn F3 was a biplane; a whole series of Bristol designs included the Type 123 biplane and the Type 133 monoplane, and the Gloster SS37 became the Gladiator biplane. Hawker entered the private venture PV3, a more powerful version of its Fury biplane fighter, while Westland entered another biplane, the PV4, and a parasol wing monoplane.

Mitchell's entry was the Supermarine model 224 which lost out to the Gloster SS37 and was to be called the Gloster Gladiator.



Supermarine model 224



Gloster-Gladiator

Fortunately, the Air Ministry had realized the Gladiator could only be a stopgap, and Mitchell and Supermarine were the right people to provide the long-term answer. They issued a new contract to back the project on 1 December 1934, after only a month as a private venture.

This was just in time. After the disappointment of the 224 Spitfire, Mitchell was determined to produce a world-beater, but his days were already numbered. His doctors diagnosed cancer and ordered him to reduce his heavy workload. Instead, driven by his fear of the Nazi threat, he strove even harder to avoid the mistakes of the earlier machine. He would only have one more chance to develop the supreme fighter and could afford no more mistakes. Everything had to be right first time. Fortunately, the gap between the previous specification and the one issued for the new fighter contract allowed him the freedom to follow his own inspiration, enough to secure the success he yearned for. When Air Ministry specification F37/34 was issued on 3 January 1935, it was written around his new Supermarine fighter project.

Now to find an engine for the new aircraft. Enter the Kestrel.



Running on 87-octane, the first production version delivered 450 hp in 1930. Rolls-Royce recruited a supercharger specialist, Jimmy Ellor, as they wanted the Kestrel to be supercharged from sea level up to high altitude.

Intended as a fighter engine, work continued on Rolls-Royce's PV12 Merlin. With bores widened to 5.4 inches, and stroke lengthened to 6.5 inches and a moderate capacity increase to 27 litres. At first, cylinder banks and crankcase were cast as a single unit. The propeller drive used double-helical reduction gears, and the cooling system was a strange hybrid using both water and steam and including both a radiator and a condenser. These were three steps too far. When the prototype PV12 had its first bench test on 15 October 1933, and it suffered a series of failures.

Accurate double-helical gears were difficult, even for Rolls-Royce. Failures of water jackets and cracks in the complex engine castings forced a return to separate blocks, heads and crankcase. Straight cut gears solved the reduction gear problem and the cooling system switched to ethylene glycol like the racing seaplanes.

For each failure, a solution would be found or a different approach would be used. If components failed, they were strengthened and the engine was reassembled and retested. Repeat failures received similar treatment, and little by little, reliability and power improved. Ramp cylinder heads were tried and rejected, pistons and supercharger bearings were strengthened, and the Merlin II went into production to power the early Spitfires and Hurricanes.

The engine was now increasingly reliable and delivering a useful 890 hp at take-off, rising to just over 1000 hp at 3000 rpm and 16,250 feet. Inlet and exhaust valves had double sets of springs with sodium-cooled exhaust valves seated on Stellite coated steel rings, screwed into the cylinder heads. Most superchargers had two-speed drives with different gear-sets connecting engine and blower through hydraulic clutches to let the pilot select one or other as necessary. At low altitudes, low ratio cut manifold temperatures and avoided over-boosting, but shifting to high gear as the aircraft climbed allowed performance to be maintained.

One note about the Merlin, it was carbureted and had a float which regulated the level of fuel in the fuel bowl. Fine for level flight and coordinated turns but problematic when the engine was inverted or the aircraft was pushed over into a dive. There were several advantages to carburetion the first being simple design and manufacture over fuel injection. The second being that having the fuel sprayed into the engine airflow caused the air to be chilled by 77 degrees F and adding 60 extra horsepower. The solution to inverted or negative G flight was

Actually simple and was called 'Miss Shilling's Orifice' and was the work of Beatrice Shilling, known as 'Tilly', a Farnborough engineer who designed a carburetor washer with a hole large enough to admit fuel for full engine power even under negative-g. How it worked was simple. When a carburetor is upright the float maintains a certain fuel level or 'head' to deliver fuel to the spray bar. If the fuel level rises the float closes a valve slowing the fuel flow and allowing the fuel level to be drawn down. If the fuel level is too low the float lowers opening the valve more and allowing the level to rise. When inverted the the action is reversed and the float moves in the opposite direction and soon the chamber is full and the mixture richens to the point that the engine quits or misfires. The orifice was sized to restrict the fuel flow to prevent 'flooding' the float chamber while still allowing adequate flow at full power operation.

One has often seen Spitfires sitting on the ground and their 'scrambled' pilots running for their planes. One may ask why didn't the pilots sit in their planes with the engine running? The answer was simple. Since the coolers (coolant and oil) were outside of the propeller blast run times on the ground were limited by engine temperature. Even taxiing could cause the engine to over heat. On a cold day, starting the engine for the first time, the coolant would boil in around ten minutes. In warmer conditions, seven minutes would be the limit for the aircraft.

What about the famous elliptical wing plan form? Ludwig Prandtl derived a theory that indicated that the lowest induced drag for a wing occurred when the lift distribution was elliptical. Prandtl showed that an elliptical span wise lift distribution the most efficient, giving the minimum induced drag for the given span.

On a final note. The Spitfire Merlin engine had another advantage, it had 100 Octane fuel available. By using a higher octane fuel boost pressures could be raised increasing horsepower and effective service altitude. The Spitfires captured by the Nazis were tested with the 'standard' 87 octane fuel which gave a false impression of the aircraft's full capabilities.

