Palomar RC Flyers Transmitter

Build & Fly

COMBAT! Are you ready? March 11th will be the first of four combat meets this year. If you've never attended a combat meet, I strongly recommend you go. This is a great way to earn "Palomar Dollars". My first Palomar dollars were earned by attending and judging in a combat meet. You don't need any experience; the combat crew will teach you and it's not complicated. Combat is extremely entertaining to watch and even more exciting if you're judging for one of the pilots. As an added bonus, I'll be cooking hamburgers and hot dogs. So come on out, it will be a fun day.

If you decide to come out for combat and you would like to earn Palomar dollars, you'll have to check in with Darrell Albert. Darrell will get your name down on his Palomar dollar list and make sure you get credit for your time volunteering. I can't say enough good about Darrell; here is a man who has been an incredible asset to the Palomar RC Flyers. He's been an active member for many years. He has served the club as lead instructor, board member, and combat Contest Director. When you see Darrell make sure to thank him for all his time and efforts. Thanks Darrell!

Monday night training is starting up on March 12th. The club sponsors this program during day light saving hours and the instructors all volunteer their time after work on Monday nights. The program will run until November 4th this year totaling 34 Monday nights. This is a great way to introduce your friends to the hobby; potential new pilots can get some hands on flying experience with an instructor. The instructors are very good, covering all aspects of the hobby starting with safety and the basics of handling an RC aircraft. Dennis Newbeck is the lead instructor and organizer so contact him for more information.

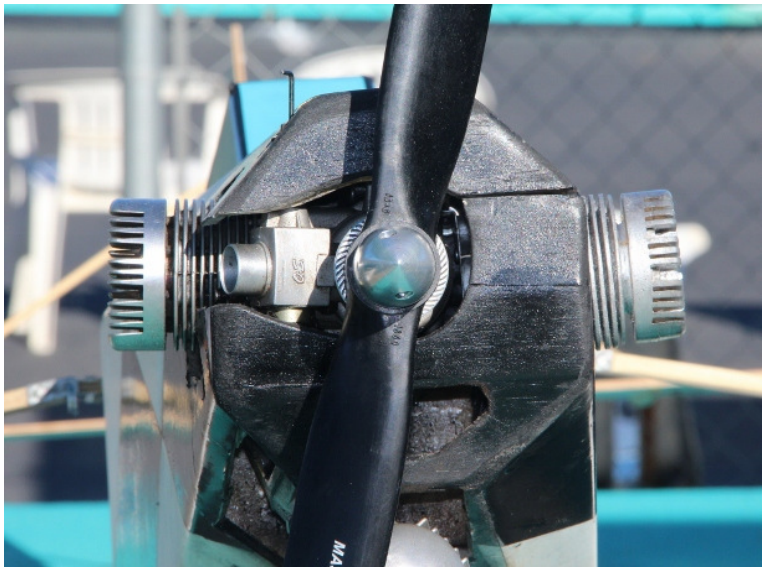
General Meeting. I've had numerous reports that Lucien Miller of "Innov8tive Designs" gave an excellent presentation at our last meeting. Thanks Lucien! Then Model of the Month again went to Frank Burke for his incredible DC-3. That DC-3 "POPS" when you open our website; great job Frank! Thank you Dave Truax for taking over in my absence and running a great meeting. I'm excited about our

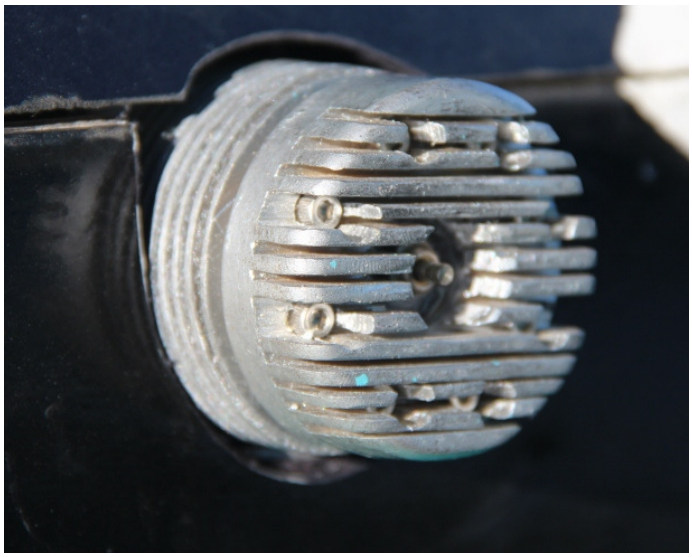
next meeting on March 15th as I've invited Randy Carlson to join us. Randy is the Civil Air Patrol Aerospace Education Team Leader for the Pacific Coast Region and is mainly responsible for the memorandum of understanding that was established between the AMA and the CAP. He will be explaining the CAP's MARC program and the benefits this program can have for our club. MARC stands
for Model Aircraft- Radio Control and is a guide line for a model building and flying program for Civil Air
Patrol cadets. The club will be hoisting the CAP Cadet Squadron 714 at our field on May 12th this year.

Caution! I was contacted by Ron Ramos from the Department of Environmental Health Vector Surveillance for access to the field so that he could monitor for Hantavirus. He indicated that he had found Hantavirus in the I-15 corridor both south and north of our location and will be doing monitoring
of the mice population on the field to determine if Hantavirus is in our area. Just use caution when working in the storage bins, especially bin #2 as there has been a lot of mice activity. Always let the container air out as much as possible before proceeding. There's very little danger outside at the field as
the virus is killed by sunlight. I'll report as soon as I have any news from Ron.

Thanks to everyone for diligence in keeping the noise level down for our neighbors. Remember keep it safe and I'll see you at the field….

Bill Hill,
President of the Palomar R/C Flyers, Inc.





Marv Clemens brought this 96", 16.5 lb. foam plane he built to the field on Feb. 9th. It has a 1.08 cu. in. O.S. 2 cycle engine, and must be flown wide open. The cylinder on the right is made from wood! Take a close look; it's a great looking fake and one cannot tell it's wooden. This time, I'm not kidding! Sometimes people comment when the engine is running that only one cylinder is on and that he ought to get the other firing too! The plane flies slowly like a trainer.

Joe Buko photos

Tom Johnston and his Toledo Special brings back the nostalgia of the 1940's. Larry Hufford is in the background. **Joe Buko photos**

Board Member Ron Schuyler and Larry Drisner

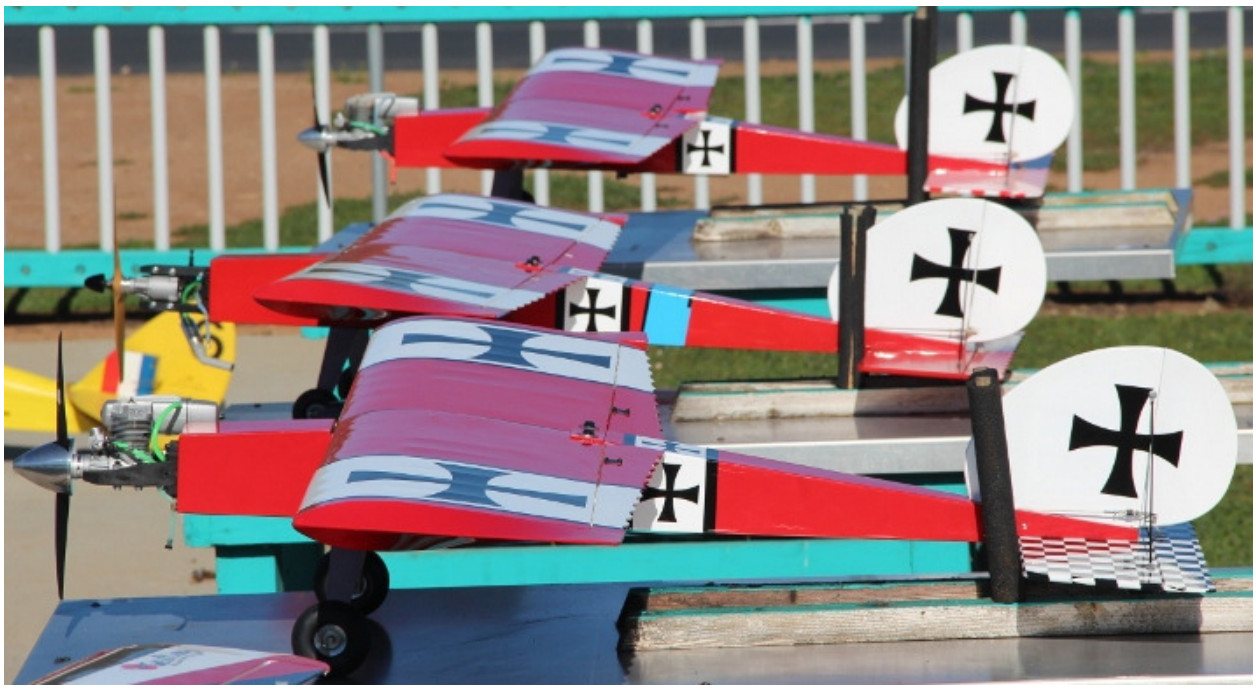
Joseph Kelsch maidened his new Pawnee on Feb. 9th

Tom Johnston looks like he's trying to spook Treasurer Varley Longson and Secretary Don Wadlington. Tom, it didn't work. Look at their smiles. **Joe Buko photos**

Steve Hoffmann and his brand new 7000 series bird.

Joe Buko Photos

Joe Buko photo

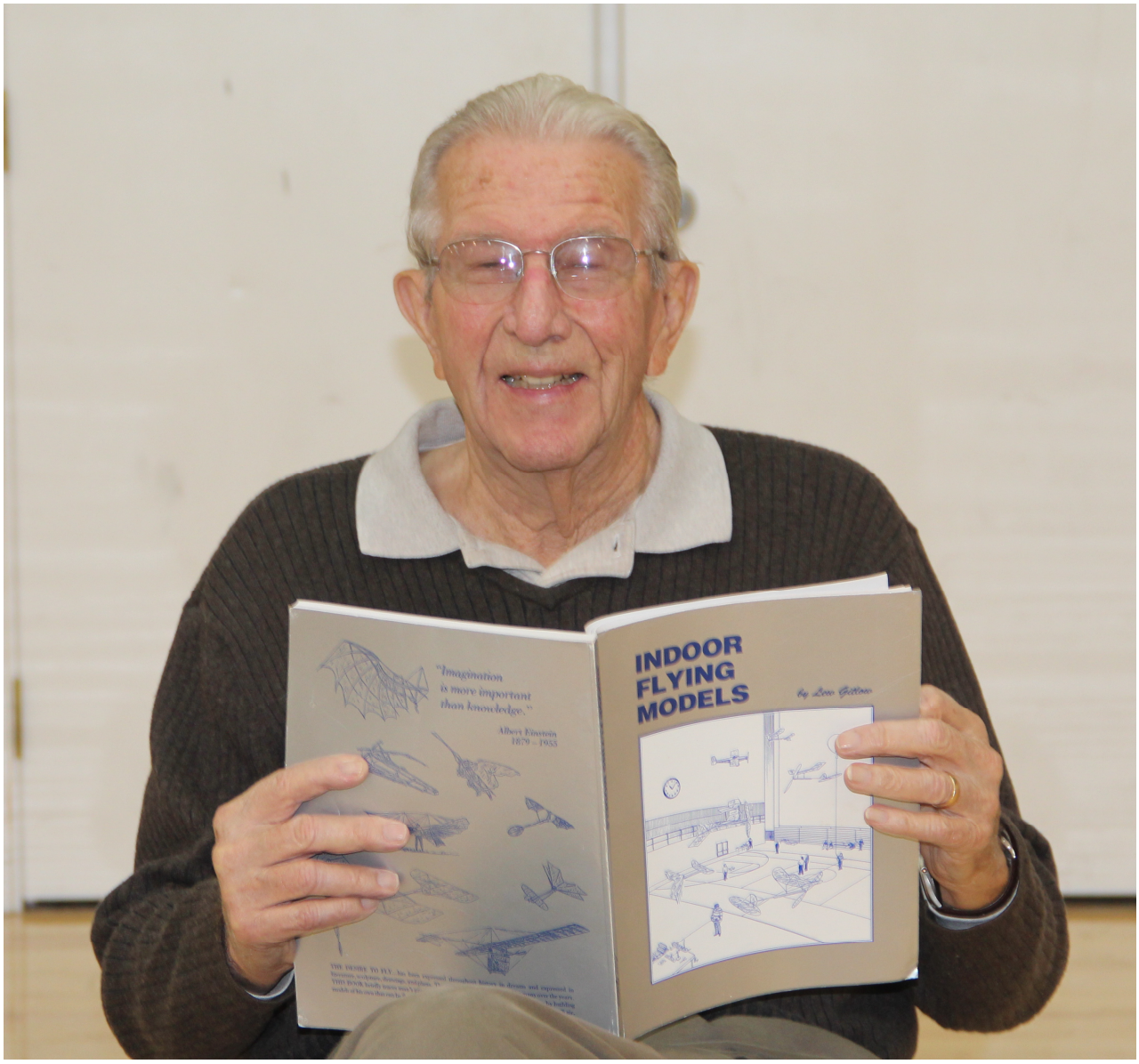


January 31, 2012 These sticks are popular even though they are ugly like old Volkswagons. They fly well. One of them belongs to Don Wadlington, our club secretary. One of Don's quotes goes: "I feel so sorry for people who don't fly r/c planes. They don't know what they are missing. They must lead very sad lives!"

o

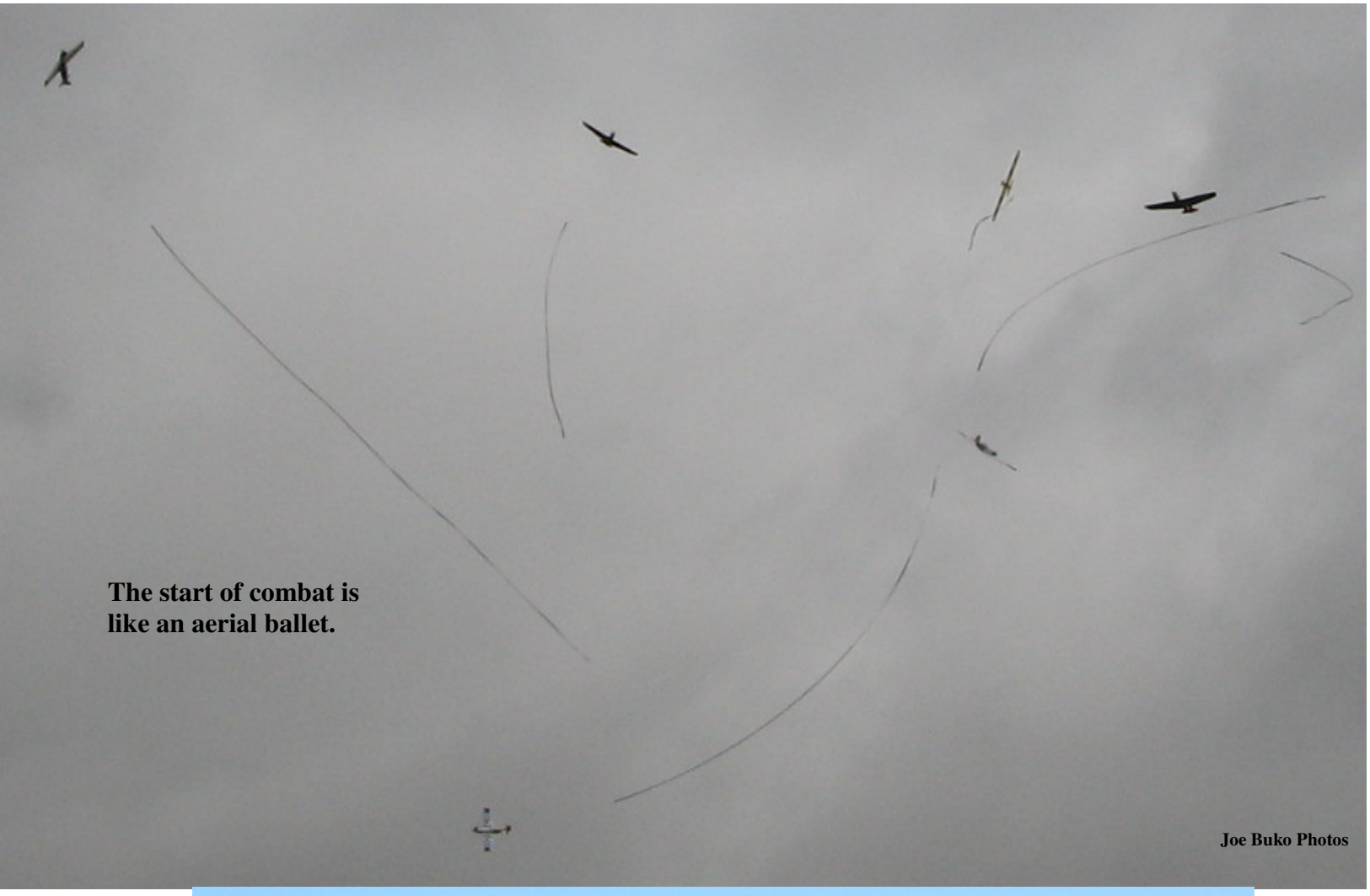
Joe Buko photos

Heinz Marschhauser and Bill Hill on Sunday, Feb. 5, 2012 @ Grossmont College Gymnasium flying indoor rubber. Heinz is just beginning this wonderful hobby.



Jack Dedrick reading the "Bible" while enjoying indoor flying @ Grossmont College Gym on Superbowl Sunday morning. Jack died on Feb. 26, 2012 from pneumonia and his obituary begins on page 28. **Joe Buko photos**

Flying three indoor rubber planes at the same time presents no radio frequency problems.



The start of combat is like an aerial ballet.

Joe Buko Photos

January 26, 2012 Ian D. Maclaughlin and former P-51 pilot, Thom Harleman

Tom has over 700 hours in a P-51!

Rich Andersen on Jan. 26, 2012. He has been a club member longer than anyone else.

Larry (Gannon Box) Hufford, a life-time member, uses this Gannon Box to smooth our roads. Thanks, Larry for your continued hard work and dedication. We appreciate you.

Joe Buko photos

Club treasurer Varley Longson's sharp P-40 cruising a slow fly-by.

Ed Ramsay's Fokker DR-1. It's a 1/4 scale Tri-plane from Balsa USA. He says that it flies like a trainer!

Joe Buko photos

Our photographer Ethel Burke and her husband, Life-Time member, Frank, the master builder, especially of WW11 birds.

Frank Burke's DC-3 and its admirers. L to R: Larry Guthrie, Roger D. Cosio, Board Member Denver Bates, Ellis Chee, Don White, Board Member Alan Wolstenholme, Larry (Gannon Box) Hufford, Roger A Cosio, Board Member Ron Schuyler.

Feb. 16, 2012 Club Meeting

Larry Guthrie is a returning member from 5 years ago, and we welcome him back.

Roger D. Cosio and Roger A. Cosio

Steven Hurd

Josef Murek

Bob Barrie and Barry Hirschberg, our web master, have much in common. Both are full scale pilots. Bob was a Naval aviator and Barry flies a Boeing 777 and gets to see much of planet earth.

Curtis Pineau brought his AJ Slick 540. It weighs 20 lbs. and has 270 watts per lb. The plane is sold by 3-D Hobbies. Checkout those wheel chocks!

Ron Schuyler helps Club Secretary Don Wadlington as they hand out free tickets to members for the $50. door prize that is given at each meeting.

Ethel Burke and Darlynn Barrie at our club meeting

New member James M. Caughney and Sean O'Connor, a former Transmitter editor.

Larry Hufford looks over some of the helicopters that Lucien Miller brought to our club meeting on Feb. 16, 2012.

Greg Wison brought his electric powered Eratix-3D for model of the month. Alphonso Alvarez is sitting next to it.

Todd Melton receives his SSC Award for combat flying in 2011 from V.P. Dave Truax. Good going Todd!

Frank Burke receives the February Model of the Month award for his DC-3.

Frank, you rock!

Frank is a life-member of our club.

Tom Atwood, editor of FLY RC

Lucien Miller made an excellent presentation on electric power for our aircraft. WOW! Thanks so much!

Tim Hitchcock received the Ace of Aces Award for combat flying in 2011 from Vice President Dave Truax. Tim was also the Open B winner for 2011. Good going, Tim!

February 2012 Model of the Month

Frank Burke and his beautiful DC-3 which everyone liked !

Frank built the Top Flite kit and powers it with 2 Magnum .52- 4cycles. It spans 82.5" and is expertly covered in Monokote. He has Robart retracts. He has flown it and it can fly on one engine! **Joe Buko photos**

February Model of the Month was awarded to Frank Burke for this Douglas DC-3 twin-engine. It was built from a Top Flite kit and was originally designed as a commercial passenger plane, but was also used by military in C-47 version with some still flying today. It has a wingspan of 82.5 in. with split-flaps; fuselage length is 55.5 in.; wing area is 750 sq. in.; wing loading is 35.7 oz.; and the weight is 11 lbs. 10 oz. The twin-engines are Magnum 52 four-stroke glow with 3 -blade Master Airscrew 11 x 7 props. Scale Robart air retracts are used.

Ethel Burke photos

AS SEEN AT THE FIELD

BY ETHEL BURKE

Jim Truett has built a new clip wing Piper Cub 40 from a Great Planes kit. It is covered with Ultracoat and weighs 7 lbs. with a wingspan of 61.5 in. It is powered by a Saito 82 four-stroke glow engine.

Graham Lloyd has a new electric Extra 300 from Horizon Hobby. This little flyer weighs only 1.2 oz. with a wingspan of 16.8 in. and comes entirely assembled ready-to-fly right out of the box from E-flite. It has a 12C li-po battery 1S 3.7v 150 mAh installed with 4 servos and a receiver with an ESC speed controller.

Ethel Burke photos

George Hubbard had a successful maiden flight with his new mini Ultra Stick from E-flite. It has a 4480 electric motor and S3-2100 lipo battery.

Michael Abbott is flying this Pitts S-2S biplane 1/3 scale ARF from Great Planes. It is powered by an OS-BGX 35cc glow engine. The wingspan is 68.5 in., wing area is 1303 sq. in., and it weighs 14 lbs.

Ethel Burke photos

Gary Kaplan is flying this new F-86 Sabre Jet from E-flite. Plane has a fiberglass fuselage with balsa wings. The tri-landing gear has suspension oleo struts. It weighs 55 oz's. and has a wingspan of 33.8 in. and length of 35.4 in. It has a 3600 kv motor EDF and 4S battery.

Ethel Burke photo

A few shots of the DA150 powered 40% 119" extra with new graphics! **John Hartsell photos.**
This is James D'Eliseo's plane.








John Hartsell photos

Editor's Corner

General Aviation News from Aviation Week

Did you know that the military is using unarmed drones the size of our models for surveillance? For example. One drone with a range of 5 Km and a duration of 45 minutes weighs 15.2 ounces! It's named the "WASP".

The next larger drone is called a "RAVEN." It has a 10 Km range with an endurance of 60-90 minutes. It weighs 4.2 lbs.

The next bigger drone is named the "Puma" and has a 15 Km range. It has an endurance of 2 hours and weighs 13 pounds.

You can watch a video of the Puma @ avinc.com/pumaae

The plane is the size of one of the models we see at the field, except it is VERY ugly. As the pilot lands it, the wing falls off because he hits the ground too hard. Folks, we fly better than "they do."

The company which makes these planes/drones is named AeroVironment. It's amazing to see that little planes like ours are being used daily by the military for surveillance.

OBITUARY

Jack Dedrick's photo is on page 8. Jack died early Sunday morning, Feb. 26, 2012 at Scripps Encinitas Hospital; he was 85. Jack fainted on Friday, Feb. 17, and when he fell, he stuck his chin and face. After regaining consciousness, he called 911 and was taken to the hospital. Ron Stoddart and I visited him on Friday, Feb. 24th. Jack's breathing was labored and he was on oxygen. He was able to communicate with some difficulty. When I left him, I had the feeling that Jack was "on final approach." He lived only two more days, and when he died, a library burned down.

James D'Eliseo said of Jack that he was so knowledgeable about our engines that he was like Clarence Lee who used to write for our hobby in the magazines. Jack was born in Nebraska and was extremely facile with machinery of all sorts. He could rebuild almost any engine or machine and taught the subject as a tech professor. At the field, he continually helped others fine tune their engines. All he had to do was listen to an engine, and he could diagnose how it was running.

When Jack was in high school, he flew free flight and liked to tell the story about his Comet Zephir. One evening his uncle visited him and wanted to see his plane fly. They went to a deserted road and fired up his ignition engine. The plane climbed to the left for about 20 seconds and then glided around and landed at their feet! His uncle was most impressed and asked if he would do it again! With a smile, Jack said to me that in a million years he couldn't duplicate that perfect flight.

He also told the story of how he narrowly survived a crash by a T-6 into a control tower at night.

Jack was in the Army Air Corps, and I believe this took place at a remote airfield in Texas. The one mile square landing area allowed the training planes to always land into the wind. One night, Jack and his supervisor were controlling the landing and departures of AT-6's. Jack held the light-gun that showed either red or green light to the pilot. He gave the signal to a pilot to take off. Instead of taking off into the wind, ran his craft straight toward Jack's light!! The tower was a two story building with a walk-around area on four sides. When Jack saw that the plane was going to hit the tower, he grabbed the supervisor and they jumped to the first floor roof, and then to the ground and ran like Olympians to get away from the impending crash! The pilot was killed. They narrowly escaped and not long after, the war came to an end, so Jack and the other new recruits were discharged.

Prior to Larry Hufford mowing the lawn at the field, Jack Dedrick was the man in charge of our ancient 1940 Fordette tractor. Jack mowed our field for years, and as a thank-you, the club officers granted him a life-time club membership.

Jack was a gentleman, polite, courteous, sensitive to the needs of others, and extremely bright. Jack, we miss your wonderful self. We are sure that as your plane landed "on the other side", your family and friends greeted you with open arms. You have finished the flight. You have flown the course. Thanks for being there for us. We miss you.

Joe Buko
Editor

NOTICE NOTICE NOTICE

RATTLE SNAKES HAVE BEEN VISITING OUR POTTIES AND ROADS!

PLEASE BE CAREFUL. LAST YEAR THEY WERE SEEN AROUND OUR MAIN GATE AND UNDER TRASH CANS AT THE AIR FIELD.

A few weeks ago Sean "Egyptsean" Garcia and several of our pilots met at the PRCF heli field to produce a very innovative heli video. Sean and his team have come up with the very first (I believe) 3D video. That's not just helis doing 3D, but its helis doing 3D shot in 3D!!! You'll need a set of red/blue glasses to get the full effect.

I'm passing this along to you so that you can share it among your friends. After viewing this video please take a few moments to thank Sean for the excellent work he has done.

Scott Dedic

FIRST OF ALL I WOULD LIKE TO SAY THAT THIS VIDEO HAS OVER 100 HOURS OF EDITING IN IT.

3-d footage is set with keyframes which change the 3d effect and if you focus on the front the back is out of focus, and visa versa, therefore you have to find a happy medium for the front and back. Some of the clips look more 3d than others because of the effort to keep the heli in focus. (not exactly and easy task when something is moving in 3 dimensions on the screen).

Anyway, I tried to make this in a file format so that it could be viewed with any type of 3d or even have the 3d turned off. But due to different file issues. (some filmed in 3d, some made in the program), this was not possible. (I tried to upload that way and it looked like crap) YOU WILL NEED RED AND BLUE GLASSES TO VIEW THIS VIDEO IN 3-D. It is kind of viewable without the glasses but I recommend using them.
ENJOY!

Sean

http://www.youtube.com/watch?v=hashkL3n97Y

(I checked out the video and even in 1-D it is awesome! Good going guys! All your hard work paid off.)
Editor

sean garcia <egyptsean2@gmail.com>;

MaxAmps.com

The Temecula Valley Flyers

hobbico

Invite You to Our

Spring Fun Fly

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http://magic.hobbytown.com/storelocator/Images/HTUSA_Logo.jpg

Saturday, April 14, 2012

Site: Temecula Valley Flyers Field

Off De Portola and Pulgas Creek Rd.
Temecula, CA 92592

Registration begins at 8:00 AM

Pilot's Meeting: 8:30 AM, Flying begins at 9:00 AM

Entry Fee: $10.00

Open to All AMA Pilots

Public Welcome – Free Admission & Parking

- Refreshments Available – Open Raffle

Pilots, Enjoy a Full Day of Flying Radio Control Model Aircraft.
Spectators, Enjoy a Full Day of Watching Radio Control Model Aircraft Fly
For More Information and Directions to The Field, Visit Our Website At:
www.temeculavalleyflyers.org Contact: Marc Guerra – (909) 553-1415

THE TEMECULA VALLEY FLYERS
INVITE YOU TO OUR FOURTH ANNUAL

SATURDAY, MAY 26, 2012

Site: Temecula Valley Flyers Field
Off De Portola and Pulgas Creek Rd.
Temecula, CA 92592
Registration at 8:00 AM, Flying starts at 8:30 AM
Open to all AMA Pilots WITH AMA CARD
Entry Fee: $10.00 Per Pilot

Public Welcome – Free Admission & Parking
Refreshments Available On Site – Open Raffle

Enjoy a Full Day of Radio Control Scale and Semi-Scale Aircraft Models. See Military Fighters and Bombers of World War I and World War II Flying All Day.
Prizes will be awarded for:
Best Static Pilot's Choice People's Choice
Best WWI Best WWII Best Jet Age (EDF)
For More Information and Directions to The Field, Visit Our Website At:
www.temeculavalleyflyers.org

Introduction to Electric Airplane Setup and Power System Selection

1 INTRODUCTION

When I started writing this article I planned on it only requiring about 4 or 5 pages, well as it turned out it is about double that so excuse my lack of brevity!

The following article is an explanation of how to select the setup for an electric airplane. This article provides and introduction to electrical motors and associated components and includes several useful references and free software programs that will facilitate your successful selection and operation of electric powered airplanes.

1.1 OVERVIEW

For some time I have been meaning to put together an article for the PRC newsletter that explains how to setup and configure an electric airplane, so I am now finally getting around to it!

This article is divided into the following sections:

Section 1.2: Electric Aircraft Terminology, Definitions and Conversion Factors
Section 1.3: Electric Motor Types: Brushless, Inrunner and Outrunner
Section 1.4: Lithium Battery Information
Section 1.5: Step by Step process for selecting the electric airplane power system
Section 1.6: Selecting the Electronic Speed Controller (ESC)
Section 1.7: Step by Step process for converting an airplane designed for a gas engine to an electric aircraft
Section 1.8: Reference material including free downloadable software for calculating your electric airplane parameters
Section 1.9: Rules of Thumb

There are many different methods that modelers use to select the appropriate motor and associated electrical parts for an electric power airplane. The following is information that I have used for the last several years and is a step by step process that is simple and effective for selecting the appropriate electric airplane setup. The information provided below will make it easy for you to select the appropriate electric motor, prop, electronic speed controller (ESC), battery and wire for your airplane.

1.2 TERMINOLOGY

Note: The item marked with an asterisk is a constant and is not included in the motor setup calculations but is presented here for your information.

Milli = 1/1,000 as in milliamps or milliohms
V = The voltage supplied by the battery
I = The current supplied by the battery AMPS or Milliamps
A = Amperes, the measurement of electrical current "I"
mA = Milliamps, 1 mA equals 1/1000 of an amp, so it takes a 1,000 Milliamps to equal 1 Amp.
mAh = Milliamps per hours
Ohms Law → E (voltage) / I (current) = R (resistance) or E=IR. So if you want to know the current that will pass through an electrical circuit you would divide the voltage (E) by the circuit resistance (R) and this yields the Current (I) that will flow through the circuit or E/R=I. Likewise, if you want to know the resistance of a circuit then voltage (E) divided by the current flow (I) yields the product resistance or E/I=R. This is a fundamental and important concept, very simple but very important!
Millohms = 1 milliohm equals 1/1000 of an ohm, so it takes a 1,000 Milliohms to equal 1 Ohm, symbol Ω.
W = Watts, watts are the power the electrical system develops, it is calculated by multiplying the Voltage (E from ohms law) times Current (I from ohms law). Provided by the motor manufacturer.

or

I^2R = Power from Ohms Law

Kv = Voltage Constant: that is how many revolutions / minute your motor will rotate for each volt of electricity applied. This is the "no load" rating, that is no prop. Since motor are not 100% efficient you will not be able to reach the theoretical Kv rating of the motor but this constant is required when to determine the motor you will select for a given airplane (provided by the motor manufacturer).

Io = No Load Current: this is the minimum electrical current required to begin rotating the motor (provided by the motor manufacturer).

Rm = Terminal Resistance: this is the electric motor internal resistance measured in milliohms as measured at the motor terminals (provided by the motor manufacturer).

***Kt** = Torque Constant, this is an electric motor constant and is 1355/Kv. This is a constant and is not a factor you can alter. It basically shows that as the motor rpm increases for a given Kv the output torque decreases.

ESC = Electronic Speed Controller

BEC = Battery Elimination Circuit

Conversions:

Horsepower to Electrical Watts Conversions:

Horsepower to Watts: 1 horsepower = 746 electrical watts

Grams to Oz:

1 gram = 0.0352739619 oz or 1 oz. = 28.3495 grams

Millimeters to inches:

1 inch = 25.4 millimeters

1.3 ELECTRIC MOTOR TYPES

Brushed Motors: Brushed motors are rarely used in model airplanes these days since they do not match the efficiencies of Brushless motors. This article only touches on the subject of brushed motors.

Brushless Motors: Brushless motors have significant advantages over the brushed motor design.

1. Brushless motors are significantly more efficient as compared to brushed motor designs, brushless motors also produce a higher power to weight ratio as compared to brushed motors.
2. Brushless motors operate off of a 3-phase Alternating Current (AC). For hobbyist type brushless motors three separate AC electrical connections are required to power the motor. Brushed motors typically use Direct Current (DC) applied to two terminals (plus terminal and the minus terminal).

Each brushless motor contains three sets of windings and each of these windings interacts with permanent magnets arranged in such a way that the poles run perpendicular to the motor shaft. The permanent magnet poles are arrange in a North or South orientation and these poles interact with the magnetic flux produced by the electrical current as it passes through each of the motors three windings.

As the 3 AC currents energize the motor electrical windings this alternating current produces a magnetic field in each of the three windings that pushes and pulls the energized winding against the permanent magnet magnetic poles.

Inrunner motors have the magnets bonded to the shaft of the motor and the three electrical windings are bonded to the case of the motor. Outrunners differ in that they have the magnets bonded to the motor case and the windings are wound around the shaft. As the name implies "Outrunner" the outer case of the Outrunner motor rotates as AC current energizes the motor windings. Inrunner motors the shaft rotates and the outer case remains stationary.

As you would expect, an important factor influencing the quality and longevity of the motor is the bonding of the permanent magnets to the motor shaft (inrunner motors) and bonding of the magnets to the case

(outrunner motors). As the motor heats up a significant thermal gradient is created and the temperature of the magnets significantly increases. If the bonding of the magnets is inferior this can lead to the failure of the motor and is often the first source of failure. Also, the quality of the bonding process directly affects the motors maximum Revolutions Per Minute (RPM) rating. One more comment regarding heat, the magnetic properties of a permanent magnets can be permanently altered (reduced) or destroyed if the heat buildup reaches the rated max. temp for the magnet. So actions that mitigate heat buildup are good things to include in your airplane setup!

Brushless motor windings for hobbyist type motors are generally wound as a Delta or Wye configuration. Passing electrical current through any one of the three motor windings produces an electromagnetic field, reversing the electrical current (that is reversing the electrical polarity of the winding) reverses the pole of this electromagnet. If you recall ohms law from section 1.2 above, all electrical conductors have some resistance to the flow of electrical current. Motors have several types of electrical resistance; this article only focuses on the most basic types of motor electrical resistance. As electrical current passes through the motors electrical windings this generates a magnetic field, but it also generates heat (termed electrical conductor loss). This is the major component of heat generated by the motor. As the electrical current increases the "conductor loss" increases as a function of the square of the current flowing through the winding. So, a winding carrying say 1 amp of electrical current has ¼ of the conductor loss as compared to a winding carrying 2 amps, and that means the conductor carrying 2 amps generates a lot more heat! Typically the motor windings have a very small electrical resistance, on the order of several milliohms but even small amounts of electrical resistance can create large losses due to heat when large electrical currents are passed through the motor windings. So increasing the current by a factor of 2 quadruples the heat produced! Other losses electrical motors experience include Iron loss which is another form of resistance. That subject is better suited for a more in-depth look at the design of an electrical motor.

The electrical windings of a motor are referred to as the "Stator". The stator is comprised of the three motor windings and these windings include a specific number of wire turns that make up each wrap of the winding. For a given motor design, that is within a specific motor model number and type, various windings (number of windings) are generally offered by the motor manufacturer. The reason for this is the motor windings in part define the torque the motor is capable of producing. So for a given motor that uses large gauge wire for the windings (that is the wire has a relatively larger cross sectional area) this motor will produce a certain torque for a given amount of electrical current. Generally the size of the motor stator is maintained for a given motor, but the number of windings is increased or decreased. If the number of windings for this same motor is increased then the wire gauge (size of the wire) must be reduced to accommodate more windings in the same physical area. As the winding increase so does the potential magnetic field the winding can produce and this means the motor should be capable of producing more torque. For a given motor design, as the number of windings increase (reducing the wire size to accommodate more windings) the electrical current carrying capacity of the motor windings decreases but the magnetic field the electromagnets can produce increases.

Other important factors regarding the electric motor design is the type of magnet used. Neodymium is more heat tolerant than some other magnetic materials (on the order of 150 degrees C max. operating temperatures) while exhibiting excellent magnetic properties. This is why Neodymium is used in some large high power high torque motors. Other factors influencing motor design include: the amount of copper used, air gap between the magnets and the windings, magnet material, type of material used for the stator and shape of the stator, bearings, magnet bonding material and max. operating temperatures of this bonding material, balance, case design and cooling.

1.3.1 Inrunner Motors

Typically inrunners have high Kv ratings and higher RPM ratings than outrunners and are often found in applications where a small prop. spins very very fast (Electric Ducted Fan's (EDF) are applications where inrunners are often used).

1.3.2 Outrunner Motors

Generally outrunner brushless motors have lower Kv ratings but in turn they produce more torque at lower speeds and are better for suited for larger props.

1.4 LITHIUM BATTERIES

- Nominal Voltage per *CELL* = 3.7 volts
- Fully Charged Voltage per *CELL* = 4.2 volts
- Minimum Voltage = Never discharge below Voltage per *CELL* 3.0 volts

S = Series, the battery pack is wired in series, that is for each battery *CELL* added to the battery pack the voltage of the battery pack increases.

P = Parallel, the battery pack is wired in parallel, that is the battery *CELLs* added to the battery pack are wired in parallel. This adds to the battery pack current handling capacity.

C = C rating of the battery pack, that is the maximum discharge capacity the battery pack can support. So for example if you have a 2,000 mAh (10C LiPo battery back then you could safely draw 20 Amps (20,000 mA) continuously until the pack reaches it minimum discharge voltage (3.0 V). The capacity of the battery pack is a representation of how many mA can be drained from the pack for 1 hour at which time the battery pack would be fully drained. As an example if a battery pack was rated at 1,000 mAh 1C then it could supply 1,000 mA (1 A) for 1 hour, but it could not supply more than 1,000 mA in one hour, but it could supply 500 mA for two hours. If the pack was rated at 1,000 mAh 2C rating it could supply 2,000 mA (2A) for one half an hour (but no more than 2,000 mA), or 500 mA for four hours. Most LiPo battery packs define a "C" burst current rating and a "C" continuous current rating. The burst current rating is a short term burst current that does not result in the battery pack temperature exceeding its maximum operating temperature (generally below 140F / 60C). As a rule of thumb, 20C to 25C rating is good for light sport flying. For 3D flying generally 35C to 45C or higher is required.

IR = Internal Resistance, this is a measure of the LiPo battery cell internal resistance to the flow of electrical current. Nominally, LiPo cells have an IR of 2 to 6 milliohms (.002 to .006 ohms). A 3S pack will have an internal resistance of 3 x 2 milliohms (.002 ohms) nominal or 6 milliohms (.006 ohms). One sign that a LiPo battery pack is aging is the IR will start to increase so monitoring the IR can help you predict the quality of the LiPo pack.

Example Battery Packs:

a) 1S Battery Pack (3.7 V nominal, 1 Cell pack), 1,000 mA, 30C Battery Pack
   This battery pack is capable of supplying 30 x 1,000 mA = 30,000 mA (30 A) of current @ 3.7 V nominal.

b) 4S Battery Pack (14.8 V nominal, 4 Cells in wired in series) , 5,000 mA, 40C Battery Pack
   This battery pack is capable of supplying 40 x 5,000 mA = 200,000 mA (200 A) of current @ 3.7 V nominal.

c) 2S2P Battery Pack (7.4 V nominal, two 2 cell battery packs (4 cells total). Two battery packs each containing two cells are wired in parallel (this provides more current capacity for the total pack). If each battery pack (that is 2 cells wired in series) have a rating of 2,000 mA, 40C per 2 cells then since the pack is comprised of 2S packs in parallel (2S2P) the 2S2P Battery Pack has a voltage 7.4 V nominal and a current rating of 4,000 mA (2 x 2,000 mA).

Always balance your LiPo battery pack, balanced to each cell within the battery pack to match the voltage of the other cells in the pack. This ensures that when the battery pack is placed under an electrical load all cells within the pack will discharge equally.

1.5 ELECTRIC AIRPLANE SETUP STEP BY STEP PROCESS

A step by step process to determine "How Much Power Does your airplane require":

1. First decide what type of flying you want to perform. The following are general guidelines for determining the electrical watts (per pound of weight of the airplane) required for a given type of flying.
    a. Park Flyers: 50 Watts to 70 Watts per pound of aircraft weight
    b. Trainers Airplanes: 70 Watts to 90 Watts per pound of aircraft weight
    c. Fast flying scale: 90 Watts to 110 Watts per pound of aircraft weight
    d. Advanced Aerobatics Sport Airplanes: 110 Watts to 130 Watts per pound of aircraft weight
    e. 3D Airplanes (lightly Loaded): 130 Watts to 150 Watts per pound of aircraft weight.
    f. 3D Unlimited: 150 Watts to 210+ Watts per pound of aircraft weight.

2. Second determine the overall weight of your airplane (full up weight) that is everything that will be part of the airplane when it is flying including the motor, battery, ESC, etc. Multiply the weight is pounds times the watts for a given type of flying you are planning to do. The product of this computation yields the watts required for your airplane.

    Example Power Required Calculation:

    Assume you want to fly a sport plane (100 Watts per pound) and assume your airplane will weigh 6 pounds (full up weight), then 6 x 100 = 600 watts of electrical power. This would be the power when the throttle is set to full throttle.

    Note: It is a good idea to provide some margin in your airplane electrical setup, good engineering practices call for a margin of 20% so add 20% to the watts calculation, or in this example 600 x 1.2 = 720 Watts design criteria. This margin will propagate through the selection of the motor, battery and ESC and will ensure that your airplane has more than adequate performance should you need a bit more than planned for i.e. the minimum of 600 watts.

3. Third select a motor that is capable of handling 720 Watts. Keep in mind that outrunners are best suited for swinging larger props. Typically an outrunner will be used instead of an inrunner for most airplanes, but there are exceptions.

    a. You will also need to take into consideration how many cells (max. voltage) the motor is designed to operate with. For instance most motors specify the max. LiPo cell count and / or max. operating voltage i.e. 3.7V = 1S, 7.4V = 2S, 11.1V = 3S, 14.8V = 4S, 18.5V =5S, and 22.2V = 6S.

    Often motor manufactures will offer the same basic motor in a 2S to 4S or 5S to 6S configuration.

4. Next you will need to determine the prop. required, battery, and esc. This may turn out to be an iterative process to narrow down the battery and / or prop.

    There are a couple of free software programs that will greatly aid you in determining the prop. and associated performance parameters. I use ElectriCalc

(www.slkelectronics.com) and MotoCalc (www.motocalc.com) both are excellent for narrowing down the prop. and battery selections. These software programs allow you to input your airplane parameters i.e. wing area, weight, battery (3S, 4S and mA rating, etc), desired prop size, motor parameters (if your specific motor is not contained in the software database of motors). The software will calculate: flight time, airplane performance parameters, battery and motor current draws, and much more!

Also, many motor manufacturers recommend props. sizes that are best suited for their motors. Each of the recommend props. includes information such as motor current draw for a given battery configuration such as 3S or 4S. ElectriCalc and MotoCalc allow entry of differing prop. sizes and show you the resulting aircraft performance and motor current draw for any given prop. size.

a. The battery power is determined by the nominal LiPo voltage per cell, the number of cells and the required current. In our case we know the power required, so:

   i. 3S Cell Pack calculation:
   720 Watts / (3.7 V x 3 Cells) or 720W / 11.1V nominal = max. current required which is 64.860 A (64,860 mA).

   ii. 4S Cell Pack calculation:
   720 Watts / (3.7 V x 4 Cells) or 720W / 14.8V = max. current required which is 48.648 A (48,648 mA).

   Note: As the battery pack cell count goes up for a given application the current required goes down. So in this example a 3S pack will require more current and a subsequently higher C rating for the battery pack. Whereas the 4S pack will require less current and thus a lower C rating for the battery pack! If the C rating of the battery pack can be reduced this generally lowers the cost of the battery pack. But then on the other hand as you increase the number of cells the battery pack costs go up as does the weight of the pack. So, you will need to take this into consideration when selecting the battery pack.

   Note: Also a word of caution, if you are considering more than one cell configuration (say a 3S or a 4S) when looking for a motor pay attention to the maximum voltage the motor can support. Usually the motor manufacture will state the max. operating voltage in terms of the number of LiPo cells (3S, 4S, 5S 6S, etc.) or the manufacturer will provide the max. operating voltage and you can figure out the max. number of cells (see voltages for the various LiPo cell counts in section 1.5 item #2 above).

b. Now we factor in the battery "C rating" or Capacity rating of the battery or in other words the maximum safe continuous discharge rate for the battery pack. So if the battery is a 30C battery then it is capable of supplying 30 times its rated

capacity. So 48,648 mAh / 30 = 1,622 mAh (1.622 Ah) or another way to say this is a 30 battery pack which has a rating of 1,622 mHa is capable of supplying 30 x 1,622 mHa or 48,660 mAh (48.66 Ah). Since there is not a battery pack rated at 1,622 then round up to 1,800 mAh at 30 which yields 30 x 1,800 mAh = 54,000 mAh or 54 Ah. If you attempt to reduce the C parameter to say 25 for instance then this battery pack would only be capable of supporting 25 x 1800 mAh = 45,000 mAh or 45 Ah which is not large enough to support this design. You could elect to increase the mAh rating of the battery pack to 2,000 mAh at 25C which might result in some cost savings. Battery packs with lower C ratings generally cost less but upping the mAh rating increases the cost. You would need to look at the tradeoffs and determine what is best for you. I prefer to be as conservative as is reasonable when selecting the setup components so that I can maximize the life of the battery pack and motor!

Note: To extend the life of my battery I use very conservative numbers when calculating the size of the battery. Also, you should never drain your battery all the way down to 3.0 V (minimum voltage for LiPo cells). Draining your batteries all the down will reduce the life of the battery. A better strategy is to only use 75% to 80% of your battery this will help to extend the life of your batteries and reduce your overall operating costs! As an example, I have been flying my Crazy 8 with the same battery pack I purchased 4 years ago and I have something like 60+ flights. But of course I am conservative when I fly and always balance the battery before flight, and generally use just 75% of the capacity of the battery during any given flight.

As I said I am generally conservative when it comes to selecting the LiPo battery. As shown in the calculations above, I would select a 3,000 mA hour 30C battery for this application. That would give me 3,000 x 30 = 90,000 mA hours or 90 A.

5. Next you will need to determine the prop. required, battery, and esc. This may turn out to be an iterative process to narrow down the battery and / or prop. I suggest the use of one of the software programs I have noted in this article to select the prop. size.

1.6 SELECTING THE ELECTRONIC SPEED CONTROL (ESC)

This is where ElectriCalc or MotoCalc also come in handy. What you need to determine is the maximum current your electric airplane will require. You can determine this by use of ElectriCalc or MotoCalc or you can use the system Watts you calculated as the basis.

Note: Most ESC include a BEC, the BEC takes the higher voltage originating from the battery and steps it down to a voltage that is required for most receivers i.e. aprox. 5 VDC. Some ESC's do not include a BEC (generally the very large 80 Amp or higher rating ESC's or optically coupled ESC's). Optical coupling helps eliminate the effects of Electro Magnetic Interference (EMI) but not generally required for most applications. So if the ESC you select does not have a BEC build in then you will need to purchase one in addition to your ESC.

1.6.1 Using the systems Watts as the basis for selecting the ESC

Once you decide on the battery you will know the voltage of the system and you can determine the current that will be required. Let's assume a 4S battery is selected, then since E (volts) x I (current) = Watts then: 720 Watts / 14.8 V (4S nominal voltage) = 48.6 Amps. Here again I like to add in some conservatism, so even though 720 watts

includes a 20% safety margin (600 calculated x 1.2 = 720) I would use a 60 amp ESC. This will give you loads of margin and help to ensure your ESC is not damaged if you get into an overcurrent situation.

1.6.2 Using ElectriCalc or other software program as the basis for selecting the ESC

ElectriCalc or MotoCalc come in handy for selecting the ESC. Since these software programs provide the motor current draw for any given prop size. Once you have settled on the prop. size the software will provide a calculation of the motor current. Let us assume that the software calculates a motor current of 49 A. Since the design is conservative use of an additional 20% margin for the ESC is a conservative approach. So 1.2 x 49A = 58.8 A so the 60A ESC is a good selection for this design.

1.7 CONVERSION OF A GAS AIRPLANE TO AN ELECTRIC AIRPLANE SETUP

Convert a glow plug engine designed airplane to an electric airplane.

Note: Most gas to electric conversion result in an airplane with a higher wing loading than the manufacturer stated wing loading for the airplane. I have converted a couple of airplanes (Tequila Sunrise and an Oscar) originally designed for gas engine and converted the design to electric motor operation. The performance is not nearly as good as those airplanes designed for electric motor operation (like the E-flight Eratix, or the Extreme Flight edge 540T). So unless you really are set on converting from gas to electric I would recommend you start with an airplane designed for electric motor operation.

Here are the parameters we will assume for this example conversion:

- .40 size glow engine designed airplane
- Trainer type, high wing airplane (70 to 90 watts of electrical power required)
- The plane weight is 6 lbs (96 oz)
- Wing Area 760 in^2

Assuming the lower to middle end of the electrical power range for a trainer (70 to 80 watts to be conservative and insure we do not under power the design). Then 70 to 80 watts per pound times 6 lbs = 420 to 480 Watts. Margin of design 1.2 times 420 / 480 watts = 504 / 575 watts design goal. So we need a motor that is capable of supporting watts of aprox. 500 to 575. Several motor manufactures offer suitable motors that would satisfy this design. As an example Hobby King D3542-6100, 1,000KV, 2 to 4 LiPo cells, 38A max. current, **665W** max. might be a good, no load (Io) = 2.4A, **wt. 130 grams** all for a price of $19.00 (+shipping $12 = $31) not bad!

Note: See rule of thumb #5 below: so 130 grams x 5 = **650 watts**, how cool is that!

Entered into ElectriCalc:

- Selected by me: 10/8 prop.; 3S LiPo 4,000 mHa (best guess for now); 96 oz.; Wing Area=760.
- From Hobby King motor data: Kv=1,000; Io=2.4; Rm=31

Calculated by ElectriCalc:

- Max. speed=50 mph; climb 865 ft. / min; 10.9 min cruise (75% pwr.); battery amps.=36.2; 61 watts/lb

This is on the low side of the power curve as calculated by ElectriCalc (61 Watts/lb) but probably ok for a first cut. It might be a good idea to look at a slightly lower Kv rating to boost the watts/lb or increase the LiPo to a 4S. If the LiPo is changed to a 4S then ElectriCalc shows 79 Watts/lb for a 10/4 prop., 35.2 battery amps, 884 ft./min climb, and 13.8 min. cruise!

The ESC is now selected, based on a motor that max. amps of 38A, then 38 x 1.2= 45.6A, so a 50 amp. ESC would work well here. You will notice this is a slightly different way to select the ESC rating than was previously discussed.

Now for the battery. If we go with the 4S battery configuration then 14.8 nominal volts x 38A= 674 Watts. Since the battery amps will be around 38A max. and I said I want cruise times around 10 to 13 min. then a 3,000 mAh (10 min.) to 4,000 mAh (13 min.) battery would work great! To keep costs down I select the 3,000 mAh (3 Ah) battery, at 20C this battery would be capable of supplying up to 60A (3A x 20=60A) which is more than adequate for this application. If we take the 38A times 1.2 that is 45A so even with margin added the battery is more than adequate for this application.

One final comment, you can back into the design by looking at the requirements of the original design gas engine parameters such as RPM and Prop. size for that gas engine as recommended by the manufacturer. Then use the gas engine RPM and prop. that will produce that RPM as parameters for the electric motor operation i.e. match the gas engine RPM and the same size prop.

That pretty much defines the conversion of this airplane from a gas engine to an electric motor.

1.8 REFERENCE MATERIAL

ElectriCalc: www.slkelectronics.com
MotoCalc: www.motocalc.com
DriveCalc: www.drivecalc.de/
Electrify Easy Conversion: www.electrifly.com/powersystem/specific-plane-conversions.html
Glow to Electric Conversion Presentation from Curtis Beaumount (down loadable pdf): http://www.tcrconline.com
Glow to Electric Conversion: http://www.rcgroups.com/glow-to-electric-conversions-247
Prop Power, Thrust and Efficiency Calculations: http://www.badcock.net/cgi-bin/powertrain/propconst.cgi.com software developed by Rod Badcock

1.9 RULES OF THUMB:

1. Always balance your LiPo battery pack, never ever place any significant electrical load on the LiPo battery pack unless all cells of the pack are balanced to each other.
2. Never drain your batteries more than 80% of their mAh rating. If for instance the LiPo battery pack is rated at 4,000 mAh then never drain more than 3,200 mAh from the pack. Be conservative with this rule of thumb, in general if a LiPo battery pack is 80% drained the battery pack cell voltage for each of the LiPo cells will remain well above the minimum 3.0 volts/cell.
3. I do not use this but it may be of interest to some. Some who use LiPo batteries have developed a rule of thumb to estimate the C rating of a given battery as compared to the manufactures stated C rating. The idea behind this is that not all manufactures rate their batteries the same so this is an attempt to evaluate a manufactures claims. This rule of thumb uses the capacity of a LiPo based on its weight. This rule of thumb defines the max. static amperage draw for a LiPo pack to be the weight in ounces of each cell times 15. The 15 multiplication factor is a best case factor, the conservative factor used by some is 11.4. So for example if a cell is rated at 4,000 mAh and weighs 3.0 oz. then 3.0*11.4 = 34.2 amps, 34.2 / 4 = 8.55 C.
4. The mass (weight of the motor) can be used to ball bark the motor power. A rule of thumb is to use 3 to 5 watts per gram of mass (wt) of the motor you plan to use. This may help in narrowing down which motors you will want to consider.

Greg Wilson, PRC Member 25 February 2012. This article was not endorsed or sponsored by any manufacture mentioned in this article.

Board Meeting Minutes, February 29, 2012 By Don Wadlington

Called to order:
The Meeting was called to order at 7:00 pm by President, Bill Hill.

Treasurer's report:
Varley gave the Treasurer's report to the Board. "The Club checking account balance is now $ 30, 099.09". "Membership is at 184". These numbers are from January 1 through February 29, 2012.

Flight Instruction presentation:
Dennis Newbeck, Lead Flight Instructor, presented his proposal for the Flight Instruction program this year. Monday night training begins March the 12th. Dennis detailed his overall blueprint for the 25 weeks of flight training and his projected budget to cover the expenses involved. The Board of Directors voted to allocate $1,800 for the program in 2012.

Club Document revision:
David Drowns updated the board on proposed revisions to our Club documents. Dave and Varley have been going over our By-laws, Constitution and Club Rules, looking for areas where they can be streamlined, condensed or reworded. The final proposals will be before the Board at the March meeting. Members will be sent an e-mail to review the changes and be ready to vote on them at the April General membership meeting.

Mowing equipment discussion:
The fuel pump on the mowing tractor has gone out. A brand new pump taken from our "spare" motor was used as a replacement. The Board voted not to allocate any funds to repair the old unit at this time.

Noise issues:
A discussion was held regarding concern over noise while flying at the field. Steps have been taken to reduce noise levels by encouraging members to utilize exhaust restrictors or change prop sizes to lower decibel levels while flying. Bill Hill will be contacting nearby homeowners to see how our efforts are working and let them know we are doing our part to minimize noise.

Combat event:
Our first combat event of 2012 is coming up on March 11th. Bill asked for volunteers to help with the cooking. Ron Schuyler and Don Wadlington have agreed assist Bill with the barbeque.

Cap Cadet event:
We will be hosting Cap Squadron 714 at our field on May the 12th. This will be the first time we have held an event for the Cadets. We hope that the opportunity to experience some " hands on" RC flying will generate future members for our Club.

Young Adventurer's Club:
The Board approved a suggestion to bring members of the Young Adventurer's Club to Johnson Field and introduce them to RC model flying. The Board picked Sat. July 14th as a tentative date for the event. Bill will be in communication with the group to finalize plans.

Heli chairman update:
Scott Dedic updated the board on Heli issues. Scott indicated a heli pilot may be willing to assist at the Monday night flight training sessions should anyone be interested in learning to fly helicopters. The 2012 Heli-Freak event is underway. The website promoting this event was posted on-line last Monday. Seven pilots have registered so far and Scott is in communication with the promoters to guarantee another great event this year.

Board Meeting Minutes, February 29, 2012 By Don Wadlington
(Continued)

Fallbrook Air Show:
The Fallbrook air Show will be held on Sunday, April 15th. The Board agreed with Bill to formally invite the Fallbrook Flyers to participate in the event. Denver Bates will be contacting their President and Vice President to inform and encourage their members to be a part of the show this year.

Combat helmets:
The Board discussed a proposal from one of our members to require "chin straps" on helmets worn by combat event pilots. Board members decided that the current hard hats worn by participants works well and chin straps are not needed.

Runway upgrades:
The topic of runway maintenance was brought up for discussion at the meeting. Board Members agreed that the runway should be resealed sometime this year. A date will be decided upon at a later meeting. It was also agreed that the taxiways not be stripped at this time.

Hanta Virus monitoring:
Bill informed the Board that Ron Ramos, vector control officer for the County was granted access to the field to monitor for Hanta virus. This virus is carried by mice and can be transmitted in dust particles. Bill suggested that persons entering container #2 allow a few moments for it to "air out" before entering, as there has been a "mouse problem" within this unit in the past.

Container keys:
David drowns has re-keyed the containers and distributed new keys to board members.

The Meeting was adjourned at 9:00 pm.

General Membership Meeting Minutes, February 16, 2012 By Don Wadlington

Called to order:
Vice president, Dave Truax, called the meeting to order at 7:30 pm. A motion was made and seconded to waive reading of the minutes. The minutes were accepted into the record.

Treasurer's report:
The Treasurer gave his report, stating the checking account balance is at $28,916.96 . Membership is now at 183. So far in 2012 the Club has received $15,470 in membership income. A motion was made and seconded to accept the Treasurer's report.

Fallbrook Air show:
Dave reminded the members that Sunday, April 15th, is the date for the Fallbrook Air Show. Everyone is encouraged to attend.

Noise concerns:
Noise is a continuing issue we must all be aware of at Johnson Field. All members are encouraged to do all they can to minimize noise while flying. Larger propellers and muffler restrictors are proving to be of value in lowering Db levels in gas powered aircraft.

Future flying sites:
Future flying sites continue to be researched. Bill Hill is staying in contact with the San Diego Parks and Recreation Dept. concerning a possible airpark in the Hwy 76 area. Also, property within Gregory Canyon is being explored as a possible site as well.

Cap Squad event:
The Club will be hosting Escondido CAP Squadron 714 for a MARC (Model Aircraft Radio Control) event on Saturday, May 12. Many of the Cadets will be experiencing "hands on RC flying" for the first time. Come out and help if you can.

Club Document revisions:
Dave Drowns and Varley Longson are currently reviewing and condensing our Club Bylaws, Constitution and Club Rules into just two documents, Bylaws and Club Rules. Their recommendations will be discussed at the next Board Meeting. The proposed changes will be published in the Transmitter and sent out as a e-mail for all the Members to review. A vote will be held at the following General Membership Meeting for acceptance.

Flying instruction:
Dennis Newbeck has accepted the position of Lead Flying Instructor for our Club. Dennis will be outlining his proposals to the Board at the February meeting. This is one of the most important programs we offer as a Club. It brings new members to us each year and provides interested pilots the opportunity to be taught by the best instructors. Monday nite Flying Instruction begins, March the 12th. Come out and enjoy the fun !

Presentation to the Club:
Following the break, Club Member Lucien Miller of Innovative Designs, gave a very interesting

and informative presentation. He spoke about "how to choose the correct electric components to power a flying model". His wealth of knowledge in the area of electric powered flight, helped everyone to understand what questions need to be addressed when choosing motors, speed controllers, batteries and propellers. Thanks Lucien, for taking the time to share your expertise with us!

Combat awards:
Dave Truax presented the awards for our recent Combat event. The Open B Class was won by, Tim Hitchcock. The SSC event award was captured by, Todd Melton. The "Aces of Aces" trophy was presented to Tim Hitchcock as well. Way to go guys!

Model of the Month Award:
Three great models were on display tonight. First, was a Giant Scale electric powered 3-D model presented by Curtis Pineau. Curtis's AJ Slick 540 is marketed by 3-D Hobbies. It is powered by a 6000 watt motor producing 7 ½ Hp. It runs 12s batteries and has a 2 to 1 power to weight ratio. Frank Burke brought his newly completed Top Flite DC-3. With an 82 ½ inch wingspan, the model his powered by two Magnum 52 four stroke engines. His plane utilizes Robart air retracts and weighs 12 pounds. Greg Wilson displayed his electric powered, Erratic 3-D arf. Power comes from a 4s battery pack and the Skyshark motor uses 118 watts of power. Greg said, "this plane is a kick to fly". The members voted to award Frank Burke the Model of the Month for February

Congratulations to the $50. door prize winner!

The Meeting was adjourned at 9:00 pm.

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NOTICE NOTICE NOTICE NOTICE NOTICE NOTICE

From: Ron Schuyler <Ronschuyler@Hotmail.com>

I can get them 20% off and Free Shipping on any Fuel can and accessories purchased at the same time. The owner is a good friend and has offered this deal to our club. I make no money on this and offer my service as a fellow Modeler. Also, anyone who wants to see the product can check my systems at the field.

anyone interested in RC Fuel Systems can check the site: http://www.jerseymodeler.com/

I can get Palomar Members a 20% discount and free shipping on Jersey Modeler Fuel Systems and any accessories bought at the same time. I tried to spread the word, by word of mouth and he (the Jersey Modeler) has refunded members after asking me if I knew them. All they need to do is request from me and I will be happy to supply the request. (cash on delivery I will pay up front).

Palomar Dollars as of Feb. 18, 2012 by Varley Longson

ALBERT	DARRELL	125.00
BATES	DENVER P.	125.00
DEDIC	SCOTT R.	125.00
DROWNS	DAVID	125.00
HILL	BILL	125.00
LONGSON	VARLEY	125.00
MICHELI	CHARLES	125.00
POHLY	GLENN	125.00
SCHUYLER	RONALD	125.00
TRUAX	DAVID	125.00
WADLINGTON	DON	125.00
WOLSTENHOLME	W. ALAN	125.00
CLARK	JOHN	30.00
MINEGAR	TOM	30.00

Note well:

This is not an exhaustive list, but these are the names that have been reported to Varley. If you are due Palomar Dollars and you do not see your name here with the correct amount of credit, please call Varley and explain your situation.

For example: Larry Hufford spends many hours each month mowing, but chooses not to report it because he is a life-member. However, you also may be spending time and may well want to report it to earn Palomar Dollars.

Club Directory

CLUB OFFICERS

PRESIDENT	Bill Hill	760-738-0644
VICE PRESIDENT	David Truax	760-747-3485
SECRETARY	Don Wadlington	619-992-2940
TREASURER	Varley Longson	760-723-1335
BD MEMBER	Denver Bates	760-728-2880
BD MEMBER	Scott Dedic	858-674-4624
BD MEMBER	David Drowns	760-740-1715
BD MEMBER	Charles Micheli	760-489-5615
BD MEMBER	Darrel Albert	760-741-2505
BD MEMBER	Ron Schuyler	760-940-0408
BD MEMBER	Alan Wolstenholme	760-749-9259

CLUB OPERATIONS

Membership		
	Glenn Pohly	858-414-9749
	Varley Longson	760-723-1335
Advertising	Bill Hill	760-738-0644
Newsletter Editor	Joe Buko	760-726-8831
WebMaster	Barry Hirschberg	760-635-0025

SPECIAL INTEREST GROUPS

RC Combat Chairman	Darrell Albert	760-741-2505
Helicopter Chairman	Scott Dedic	858-674-4624

LOST AND FOUND

Vacant 760-727-4574

HEAD INSTRUCTOR

Vacant 760-727-4574

SAFETY COORDINATOR

Todd Melton 760-305-8983

INSTRUCTOR LIST

Arnon Bourner	Basic Flight	858-385-0807
Butch Abongan	Basic Flight	760-855-2162
David Drowns	Basic Flight	760-740-1715
Todd Melton	Basic Flight	760-305-8983
Glenn Pohly	Basic Flight	858-414-9749
Tim Hitchock	Basic Flight	760-458-8961

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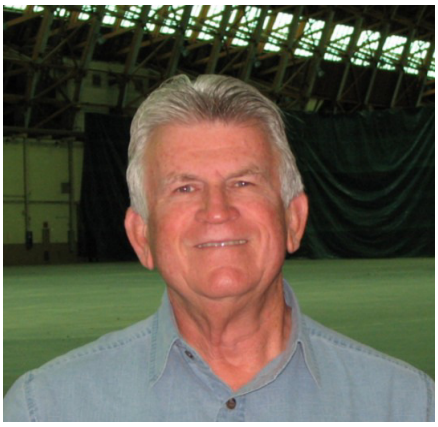
2012
CLUB OFFICERS

President Bill Hill

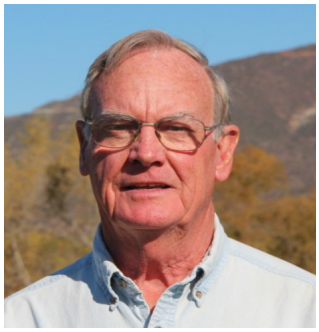
Vice President David Truax

Treasurer/Membership Chairman
Varley Longson



Secretary Don Wadling-

Club Board Members



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FOR SALE COLUMN

From: Tommie.Egbert@sharp.com
To: info@palomarrcflyers.org
Date: Wed, 8 Feb 2012 11:46:40 -0800
Subject: Planes, radios, engines...

Hi,

My Dad was an avid R/C plane builder and flyer in the 80's and early 90's with the San Diego Drones R/C Club that used to fly off Proctor Valley Rd. About 10 years ago, he lost his sight due to macular degeneration, and had to give up the hobby due to the blindness that followed.

He has a number of planes, some custom-designed, as well as engines and radios that he'd like to sell to an R/C plane enthusiast. I am not sure if you can pass the word to club members or direct me to another person or place better suited to match my Dad with interested buyers.

His name is Tom Lawrence. His phone number is 619-421-7571. He lives in Chula Vista. I know nothing about the planes, so he's the best contact. To my knowledge, he's got quite a number of items he's like to part with. Please call him if you can help out in any way.

My cell number is 619-840-4557 if you'd like to contact me as well.

Thanks so much!

Tommie Egbert Supervisor, MPI Dept.

858-499-6574

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