The Flightline

Volume 43, Issue 6 | Newsletter of the Propstoppers RC Club | AMA 1042 | June 2013

President's Message

I feel show & tell went over well so we will continue. Show & tell then club business. We will go over the Elwyn field. Situation.

Don't forget the picnic June 15th. We could use help with the sodas and tents we will ask at the meeting for volunteers.

Maybe we can get Al to bring his control line planes to the Picnic. The field is ready and waiting.

If you have something to show off bring it to the meeting so we can all enjoy.

See you at the meeting

Dick Seiwell, President

Agenda for June 11th Meeting

At Middletown Library;

Doors open 6:00, meeting at 6:30

1. Show and Tell
2. Membership Report
3. Finance Report
4. Elwyn Field Situation

INSIDE THIS ISSUE

Minutes of the Propstoppers Model Airplane Club

May 14, 2013 at the Middletown library

Call to order took place at 6:30 PM by Vice-President Jeff Frazier

Roll call by membership chair Ray Wopatek showed 14 members and one guest present

Treasurer's report by Pete Oetinger was presented to the club

Minutes of the April meeting as published were accepted by the membership

Old Business:

President Dick Seiwell noted that Middletown pride day went well in spite of early and late rain. Kids especially enjoyed the simple gliders made by Dave Bevan that were passed out and the flight demos by Jeff and others.

New Business:

Dave Bevan showed the club a map of the flying area at Elwyn as measured by him and Dick Seiwell They are meeting with the Elwyn representatives to determine the boundaries of our flying.

Show and Tell:

Al Tamburo showed a photo of his plane at a night flight in the past. He also showed a 1960's single channel transmitter and receiver that worked via an escapement mechanism. One click turned left two clicks turn right. He also demoed a 2.4 GHz conversion of his old 4 channel 72 MHz Futaba.

Al then demonstrated a working system that he described in the past. It controls the flight of an electric control line plane. It can control flight time, motor speed and even retracts. The various functions are pre programmed or adjusted by a control surface position in flight.

Calendar of Events

Club Meetings

Monthly Meetings
Second Tuesday of the month.
Middletown Library
Doors open at 6:00, meeting at 6:30 pm.

Next Meeting; 11th June

Tuesday Breakfast Meeting
Tom Jones Restaurant on Edgemont Avenue in Brookhaven. 9 till 10 am. Just show up.
Flying after in the summer at CA Field or Chester Park; 10 am. Weather permitting.

Regular Club Flying

At Christian Academy; Electric Only
Monday through Friday after school till dusk
Saturday 10 am till dusk
Sunday, after Church; 12 pm till dusk
At Elwyn Field; Gas or Electric
Monday through Saturday 8 am till dusk
Sunday 12 pm till dusk

Indoor Flying

Wait till the Fall!

Special Club Flying

Saturday mornings 10 am
Wednesday Helicopter evening in summer
Thursday evenings in the summer
Tuesday mornings 10 am weather permitting after breakfast.
Check our Yahoo Group for announcements;
http://groups.yahoo.com/group/propstoppers/

Beginners

Beginners using due caution and respecting club rules may fly GWS Slow Stick or similar models without instructors at Christian Academy Field. The club also provides the AMA Introductory Pilot Program for beginners without AMA insurance.

Propstoppers RC Club of
Delaware County, Pennsylvania.
Club Officers

President Dick Seiwell reslawns@verizon.net
(610) 566-2698
Vice President Jeff Frazier jfrazier@comcast.net
(610) 357-4557
Secretary Richard Bartkowski
(610) 566-3950 rbartkwoski@comcast.net
Treasurer Pete Oetinger
610-627-9564
Membership Chairman Ray Wopatek
(610) 626-0732 raywop@gmail.com
Safety Officer Eric Hofberg
(610) 565-0408 bgsteam@comcas.net
Newsletter Editor
Dave Harding davejean1@comcast.net
(610)-872-1457

Propstoppers Web Site; www.propstoppers.org

Al Tamburo's 2.4 GHz conversion of an old Futaba 72 MHz radio.

Above; Al's pulse single channel radio with a rubber band powered escapement for control.

Right; Al's U/C control system demonstration.

Adjournment took place at 7:45 PM

Dick Bartkowski,
Secretary

Middletown Community Day Report

The weather started out looking badly Saturday morning, but that did not stop us! The skies were overcast as we all drove to the event. I flew my Trex 700 nitro helicopter to kick off the day, but shortly after my flight it ended up raining for a bit. We stuck it out under Phil McQuilling's tent for about 45 minutes. I am glad we waited, as it ended up being a great day. I actually got some minor sun burn! Luckily, we all left just as the sky opened up with a downpour at the end of the day. Funny part, by the time I made the 10 minute trip home, it was sunny out again. What a strange day for weather!

Overall, it was a lot of fun. We all really enjoyed ourselves. We spoke to a lot of people from the community (adults and kids). A lot of great questions and interest! Dave Bevan handed out "Propstopper" balsa gliders to the kids. They really enjoyed them. We performed 15+ demonstration flights of both helicopters and planes. We had both types of helicopters too - electric and nitro - it was awesome.

I would like give a **BIG** and special thanks to those of you who took the time to support all of us and the club by being present:

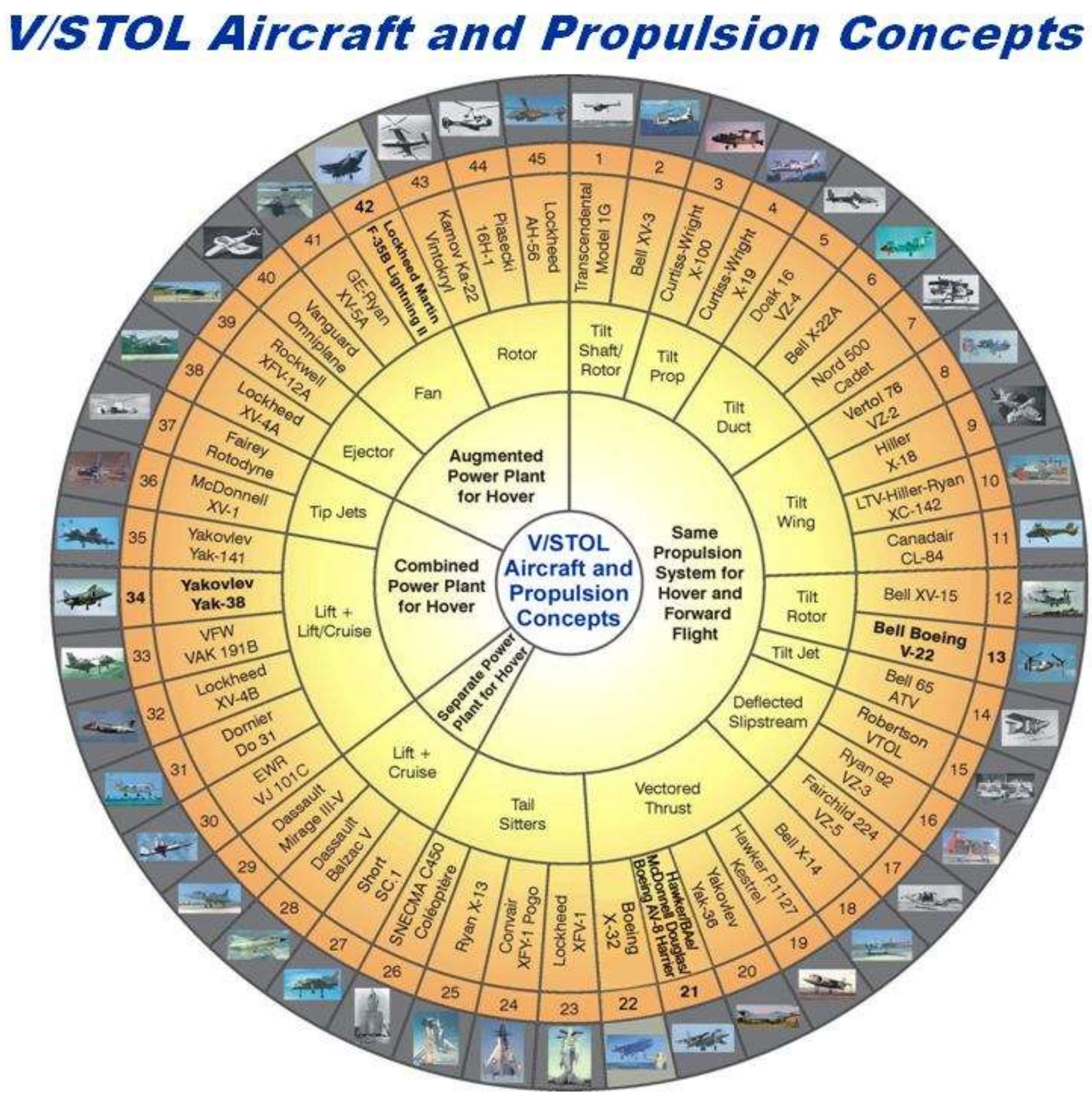
- Dick Seiwell
- Dave Bevan
- Chuck Kime
- Pete Oetinger (and his wife)
- Phil McQuilling
- Matt Borden
- Dave Harding
- Ryan Schurma

Jeff Frazier Vice President

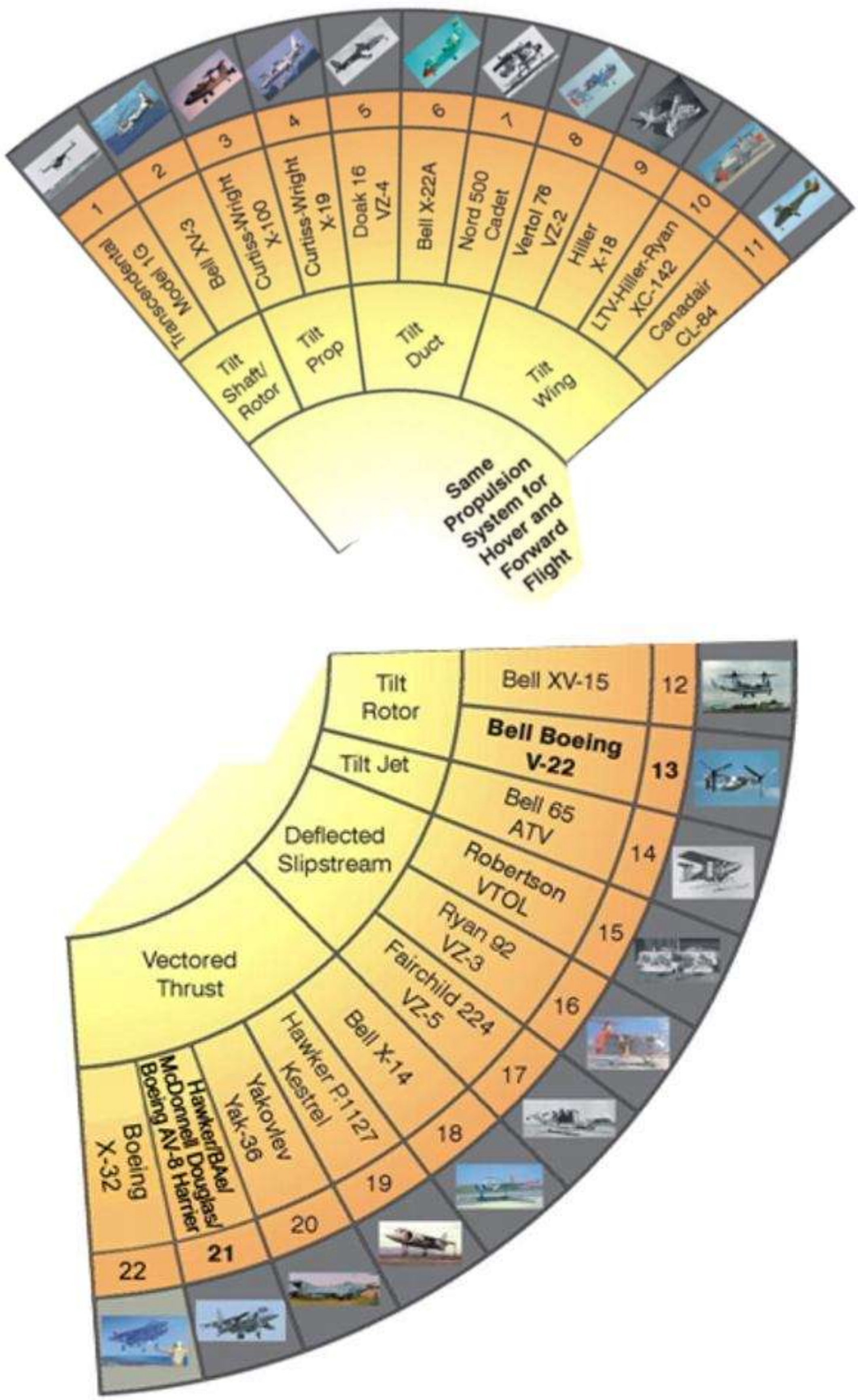
Compound Helicopters

In the April newsletter I described the history of rotary wing airplanes from Cierva's autogiro through to today's helicopters and the Osprey. But there are many other routes followed to achieve air vehicles which takeoff vertically and fly fast. Most of them failed to progress beyond the concept or prototype stage. Some while back the think tank ANSER developed a graphic depicting this history. It is called the ANSER wheel for obvious reasons.

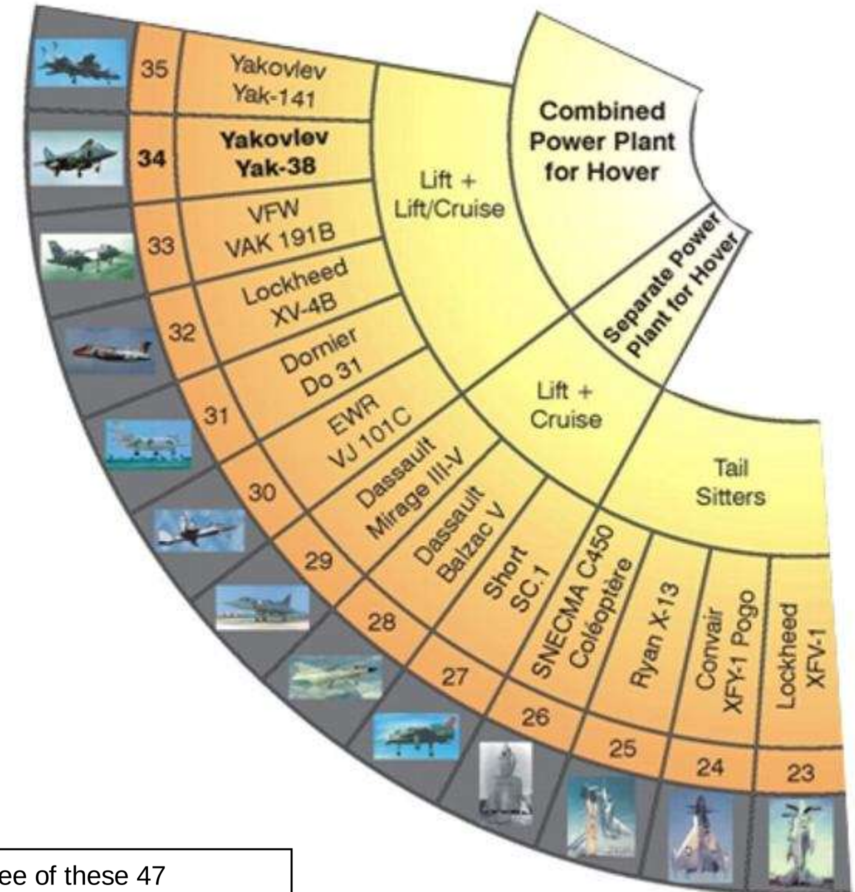
V/STOL stands for Vertical / or Short Takeoff and Landing. The reason for this is many VTOL concepts can takeoff in short distances with much greater payload than VTOL or conventional airplanes. A good example of this is the jump takeoff from a ramp of the AV-8 on British special aircraft carriers.



OK, you can't read it so let me cut wheel into pieces you can.

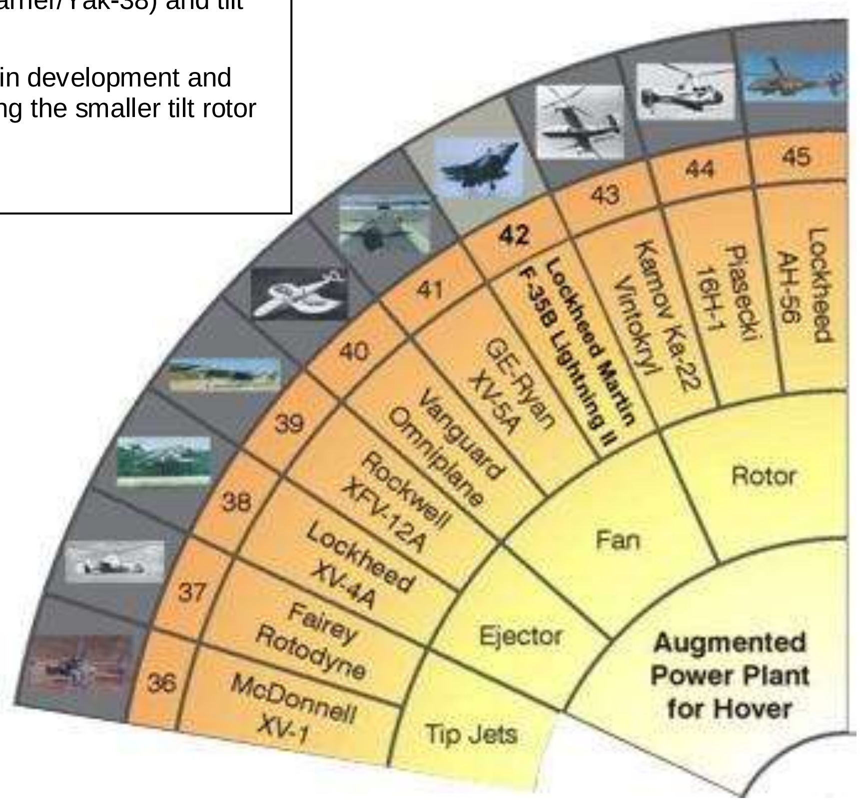


1 Transcendental Model 1G
2 Bell XV-3
3 Curtiss-Wright X-100
4 Curtiss-Wright X-19
5 Doak 16 VZ-4
6 Bell X-22A
7 Nord 500 Cadet
8 Vertol 76 VZ-2
9 Hiller X-18
10 LTV-Hiller-Ryan XC-142
11 Canadair CL-84
Tilt Shaft/ Rotor
Tilt Prop
Tilt Duct
Tilt Wing
Same Propulsion System for Hover and Forward Flight
Tilt Rotor
Tilt Jet
Deflected Slipstream
Vectored Thrust
12 Bell XV-15
13 Bell Boeing V-22
14 Bell 65 ATV
15 Robertson VTOL
16 Ryan 92 VZ-3
17 Fairchild 224 VZ-5
18 Bell X-14
19 Hawker P.1127 Kestrel
20 Yakovlev Yak-36
21 Hawker/BAe/ McDonnell Douglas/ Boeing AV-8 Harrier
22 Boeing X-32



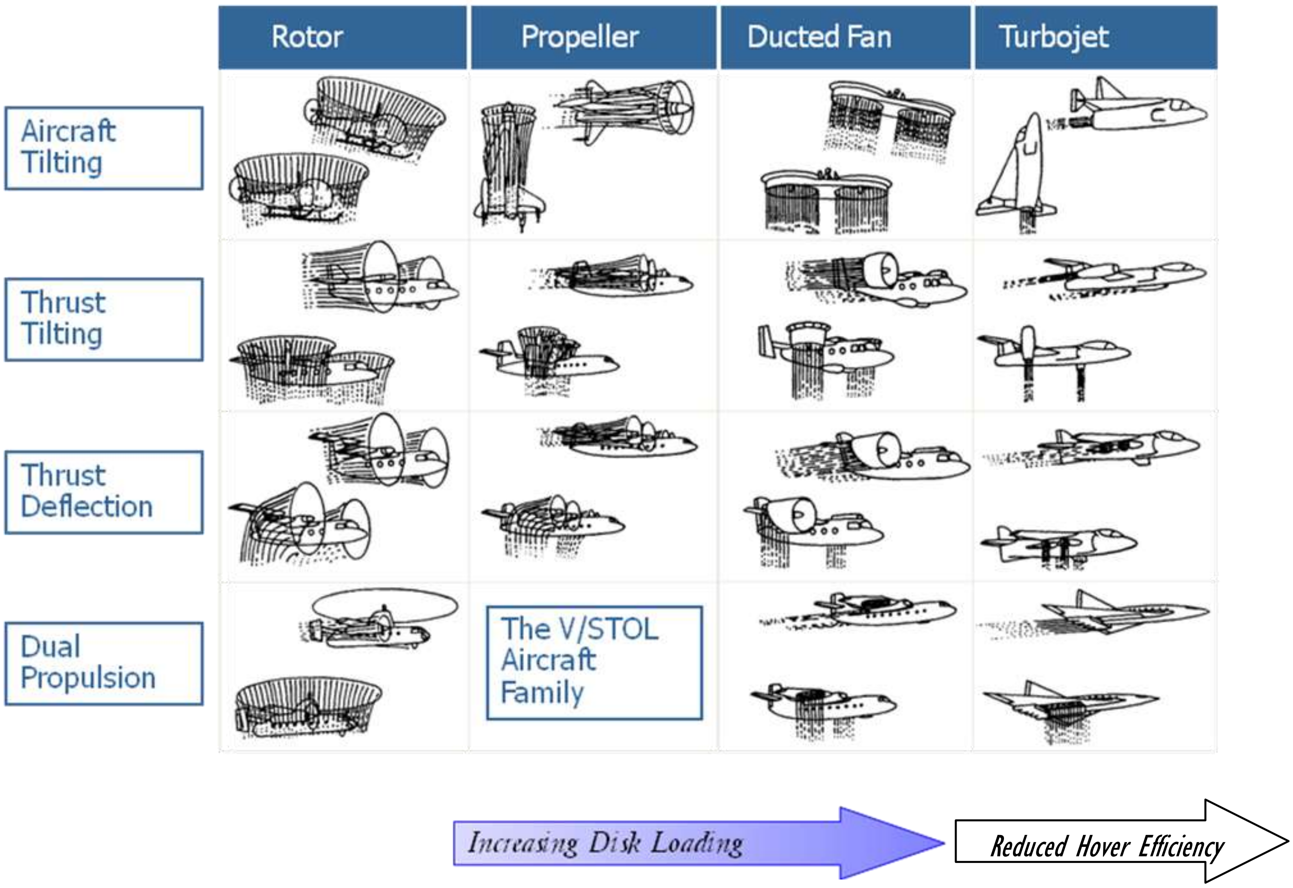
Incidentally, only three of these 47 concepts have progressed to fleet service. The direct-jet lift (Harrier/Yak-38) and tilt rotor (V-22).

The F-35B Jet lift is in development and Augusta is developing the smaller tilt rotor the A 609



Here is another way of looking at the alternatives;

Several V/STOL Aircraft Lift and Thrust Arrangements



Lot of stuff eh? All in search of the Holy Grail; VTOL and high speed. Well, not exactly, there are a variety of requirement combinations involving vertical takeoff. Some just want to takeoff vertically so as to avoid a long runway and then go fast, others want to be able to hover efficiently and go fast. See if you can sort out which concepts match which set of requirements.

Incidentally, our Dave Bevan was very much involved with a US Navy initiative to go all VTOL back in the late 1970s. They wanted to put all their aircraft on a baby flat top called a Sea Control Ship; http://en.wikipedia.org/wiki/Sea_Control_Ship ; including supersonic fighter/bombers, tankers and transports and helicopters. One of the most demanding additional requirements was each of them had to have one engine out performance. Now it is hard enough to make a supersonic VTOL, much less one that could do it with one engine out! So despite much work the initiative failed and more huge aircraft carriers were built.

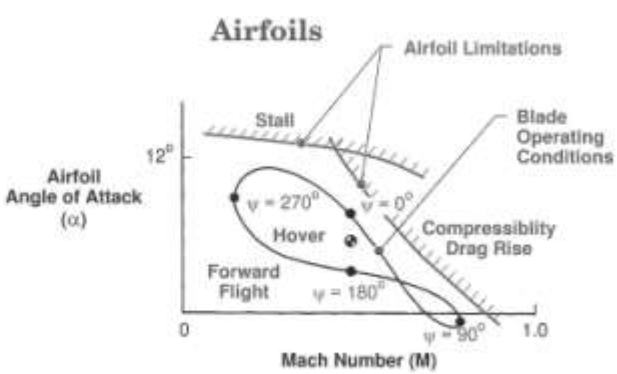
But I digress.

Anyway, we were examining the development of helicopters and high speed versions, called compound helicopters because they compound the helicopter machinery with auxiliary propulsion and wings.

To recap why pure helicopters can't go faster let's go back to the aerodynamics of the helicopter rotor we discussed in the last chapter.

As the helicopter flies forward the aircraft's speed is added to the rotor speed on the advancing blade side and subtracted from the retreating blade. But in a simple rotor the lift must balance side to side so the advancing, higher speed side reduces its angle of attack and the retreating side increases it. Eventually the retreating blade angle of attack will reach the stall point so further lift is either not achievable or the drag becomes too high. What to do? Well, you could increase the rotor speed so by increasing the retreating blade airspeed. But eventually you will reach the point where the advancing blade tip reaches the critical mach speed, the point at which supersonic speeds are experienced at some point in the airfoil resulting in high loads and increased drag. So now you are in a corner between stall and compressibility. What to do?

Well, you can reduce the rotor thrust, but you still need to provide the vehicle with lift and propulsive thrust. So you can add a propeller to provide the thrust and reduce the net thrust on the rotor, or maintain the rotor thrust but add the prop thrust for higher speed.



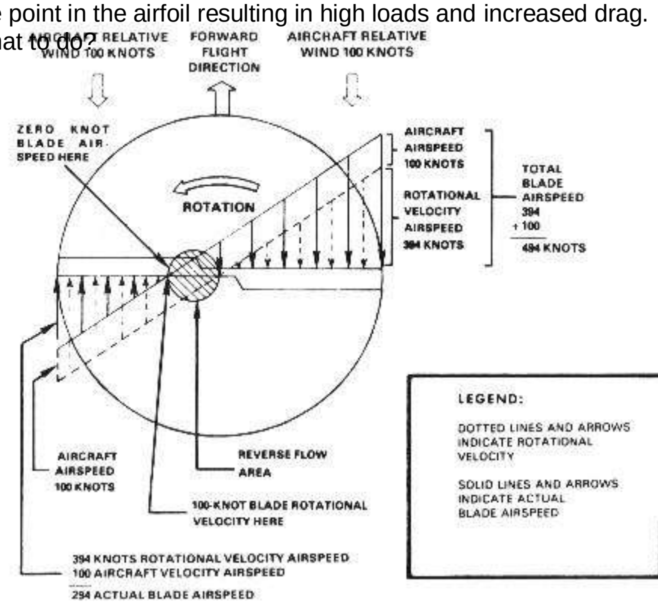
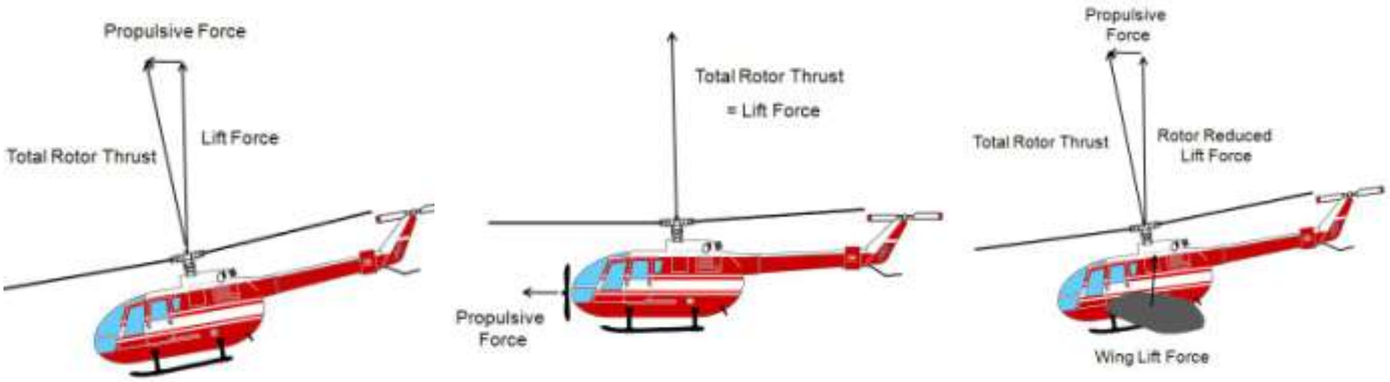
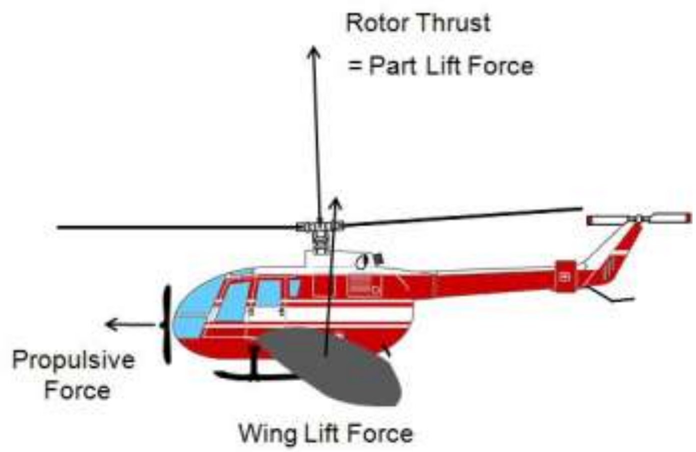


FIGURE 2-49. DISSYMMETRY OF LIFT.

But you could add a wing to carry some of the lift and tip the rotor over for increased thrust.



Or you could do both add a wing and propeller. Of course you would need to add more power too. The faster you go the more you have to slow the rotor and reduce its lift, but in our work on these things we found you still needed to power the rotor. This is essentially the configuration of the Lockheed Cheyenne of the late 60's. It had a pusher propeller at the aft end. But as I previously described, they screwed it up with a rotor control system that was inadequate at the higher speeds.



Now the big problem with such configurations is they get bigger and more expensive than a pure helicopter. There is the drive system and propeller, increased engine size, bigger fuel tanks and more fuel and the weight of the wing. Of course the control system is more complex and heavier, at least it was in that time frame but nowadays we have composite structures more efficient engines and wonderful computer based flight control systems. So people are once again examining compound helicopters.


Lockheed AH-56 Cheyenne 1967

Some of the current interest is based on the developments of the Carter Copter, a slowed rotor compound. Carter claims that by slowing the rotor way down the overall L/D of the airplane could be double that of the current pure helicopter (half the drag, half the power required the same speed or 26% more speed for the same power).

Here is the latest compound from Eurocopter.

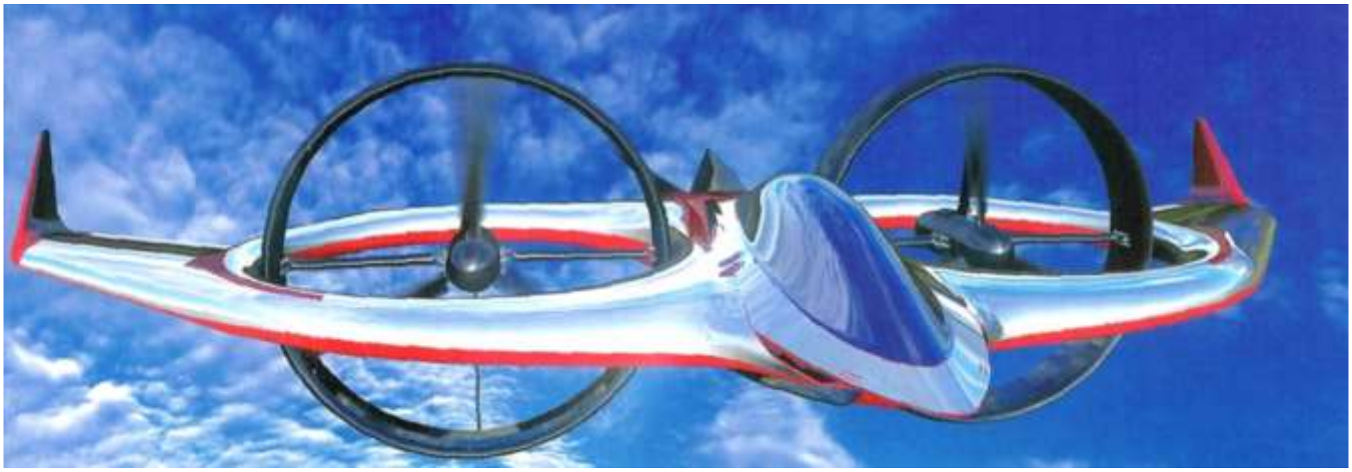
No to make one of these things work you basically need two different control systems; conventional helicopter controls for hover and moderate speed forward flight and conventional airplane controls for high speed flight. Oh, you also need automatic controls to slow the rotor as you approach the high speed mode then null, or just trim the helicopter controls in this flight mode. This was a real challenge back in the days of the Bell and Lockheed high speed research compounds because the controls were entirely mechanical with hydraulic boost. Nowadays almost all of this can be done by electronics; the stuff "we" use in our quad rotors and stabilized airplanes.

Sikorsky has a different approach in their history. They developed a configuration incorporating a coaxial rotor system with very rigid blades. They dealt with the asymmetric lift by allowing one rotor to counter the other so each rotor loads the advancing blade without concern for balance across that rotor. So the retreating blade could fly at a low incidence avoiding stall and high loads. They call the concept ABC, or Advancing Blade Concept. Because the rotors can be much higher loaded than a conventional helicopter they can maintain lift to much higher speeds. But the best configuration with such rotors still benefit from additional thrust. The first one flew in the 1960s. It was a compound with two J85 jet engines. The army evaluated the plane but the thirsty jet engines meant the endurance was in the order of twenty minutes. They gave it a pass.

But with the new interest in pushing helicopters to higher speeds Sikorsky has once again developed a prototype using composites, efficient engines and an efficient propeller propulsion.

Meanwhile Augusta Westland just released this tilting rotor machine on the World; Project Zero

.



So what you say? Well, what with all the helicopter and advanced technology flight control and autopilot technology in the club I thought someone might get caught up in the thrust of advanced helicopters and build a compound. How about it guys?

By the way, the Model helicopter World Speed Record stands at about 97 mph. You can see the video of these flights here; http://youtu.be/svNvbgRGa5w

So let's just examine the flight parameters for a Trex 700. The rotor diameter is about 63 inches and folks seem to fly them at a head speed of 2000 rpm. That gives a rotor tip speed of 525 ft/second and Mach 0.46 (at sea level on a standard day). One fellow says his runs at 2500 rpm so that would have a tip speed of 650 ft/sec and Mach 0.58. The advance ratio, Mu is 0.28

Now let's us assume the speed record was set at the higher tip speed then at 100 mph the advancing tip speed is (rotor speed plus flight speed) 800 ft/second and Mach 0.71 and the advance ratio 0.23 ~ now that is getting interesting, but not near the advance ratio where control will become impossible, nor thrust diminish too greatly. But if you wanted to go much faster you would probably need a separate propulsive device. Hey, you could make one look just like the Eurocopter Compound.

Anyone game?

Dave Harding

Why your Editor does not fly free flight.

My UK boyhood model airplane club friend Jim Mosley lives in Canada. He is a member of SAM 58 the Canadian chapter that for many years has held a SAM contest in Geneseo, New York, just south of Rochester in the Finger Lakes region. This is the field you have seen in Model Aviation because this is where the Flying Aces hold the FAC Nats every other year. (and the Non-Nats in-between years!). The field is very lightly used for normal aviation and is the home of the Historical Aircraft Group HAG museum. The SAM contest, known as the Great Grape Gathering, is famous for awarding bottles of wine for contest placing. A first place gets a bottle that has placed first in a Wine Tasting. The GGG is mostly a free flight contest but a while back they also had RC Old Timer events too so in 2003 club member Ed Goretzka and I went up for the weekend in my RV. We had a grand old time too.

Anyway, it was also the occasion when I had a fifty-year reunion with my friend Jim. Jim was the free flight contest director and he also runs several free flight postal competitions and is a regular contributor to the SAM Talks Yahoo chat group. Recently he posted the following story.

"Went Flyin' ".   Took a bunch of power models to Geneseo at the weekend which have been neglected for a number of years - some not flown for maybe 15 years plus a couple of un-flown ones. Good intentions that didn't quite work out due to some balky engines, old fuel ... and a starter box that broke..... However, amongst other things ... I took out a brand new 1/2A Nostalgia "Creep", a couple of hand glides and fired up the (Cox) Medallion. So far so good.   Now the tracker (an RF miniature transmitter that works with a Yag antenna for direction finding downed models-Ed.) slides into a tube at the rear of the pylon, alongside which are two tiny wire hooks that secure a d/t band to keep the 'bug' firmly in place. It was a good idea on the board. In practice, I shift grip on the fuselage and run one of these hooks into my thumb - and out again, leaving me firmly attached to the model with a hook that won't come out again unless maybe I tear it clean through the flesh and skin. In trying to do this I put the other thumb through the fuselage side, simultaneously with the offending hook breaking free from its position by the tracker; all of which takes me by surprise and I inadvertently lose my grip on the model which promptly heads for the clouds on a full pacifier (a baby pacifier that is used as a high pressure fuel tank by inflating with fuel-Ed) with no d/t set and engine timer not started - leaving me standing there with a wire sticking out of my thumb.

Quite nice trim as it goes up OOS (Out Of Sight for you RC guys-Ed). Engine finally quits. All I have left is a fading 'beep' on my receiver. I drive around the NY back roads for an hour or so, stopping frequently to listen for a signal - no joy. Back on the field I do have a faint return from the end of the runway with the Genesee River in the way. The 1941 HAG people advise me where to drive to a point from which I could see the hangar ... duly found, from which I slowly make my way down to the river through cattle fields, electric fences (ouch), etc. and there I once more regain a faint 'beep' which then leads me through dense brush, water, a manure storage field, deep gullies and steep slopes and eventually, to a road. It's the same road on which the car is parked about a mile away, hmmm.

Opposite is what appears to be an expensive country club in manicured rolling grounds. Now this day was Graduation Day at the University; and at this place there was a large upscale party in full swing with music, large numbers of the beautiful people standing outside socializing with drinks and snacks. I approach - dirty oily T-shirt, ragged cutoffs, broken-out 'tennies' (sneakers-Ed.) (water goes in one hole, out of the others) liberally smeared in cattle dung, 'country yokel' hat down over my ears, carrying a beeping antenna. This causes a lull in the chatter as I pass through the gathering politely saying 'good afternoon' to left and right. Nobody offers me a drink. The model was in a gully a few hundred yards further along. I returned to the road via their parking lot, being as they were an unsociable lot, and trudged back to the car thinking that if I'd driven another mile I'd have got a signal from close by and so not gone through the country assault course. Trackers are wonderful tools. Flying (free flight - Ed) models is so much fun ....Jim Mosley

Dave Harding from Jim Mosley

Dynamic Soaring Speed Record 468 mph

Watch the lunatic fringe break the speed record in a 65 mph wind on a California hill. http://youtu.be/rfoxjNg-eg0

It is hard to see the model in the first half of the video but have patience and wait for the second half.

See the article on Dynamic Soaring in the December 09 newsletter; http://www.propstoppers.org/pdf_files/dec09.pdf

Meet New Member Dr. Al Cheung

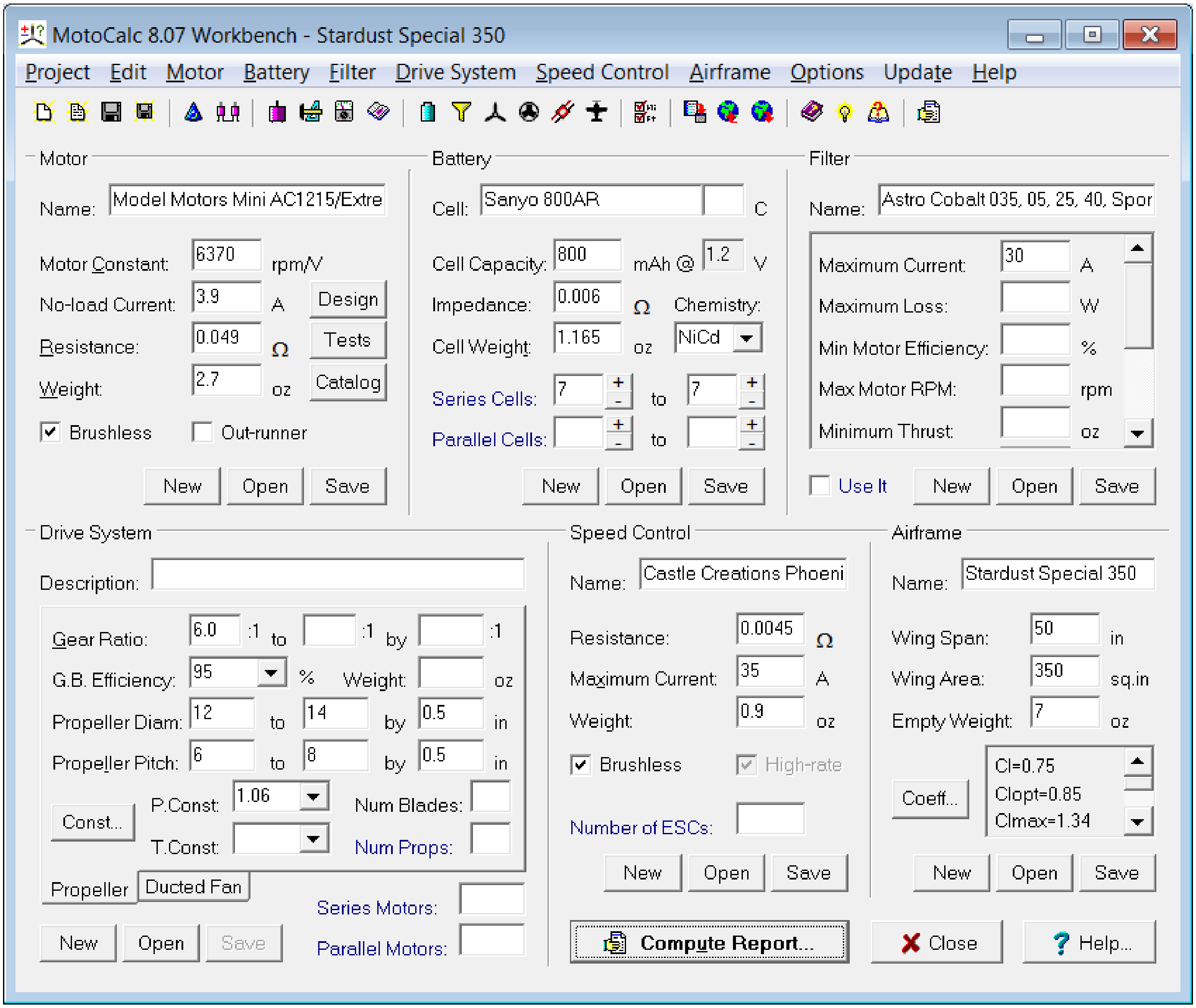
Dave Bevan gave the Helicopter Museum Royal Tour to Al and his son recently and they both have a passion for aviation. Al is starting from scratch but is already proficient in flying his small Parkzone T-28.

He has been joining us for the Tuesday club breakfasts. Say hi and introduce yourself at the field.

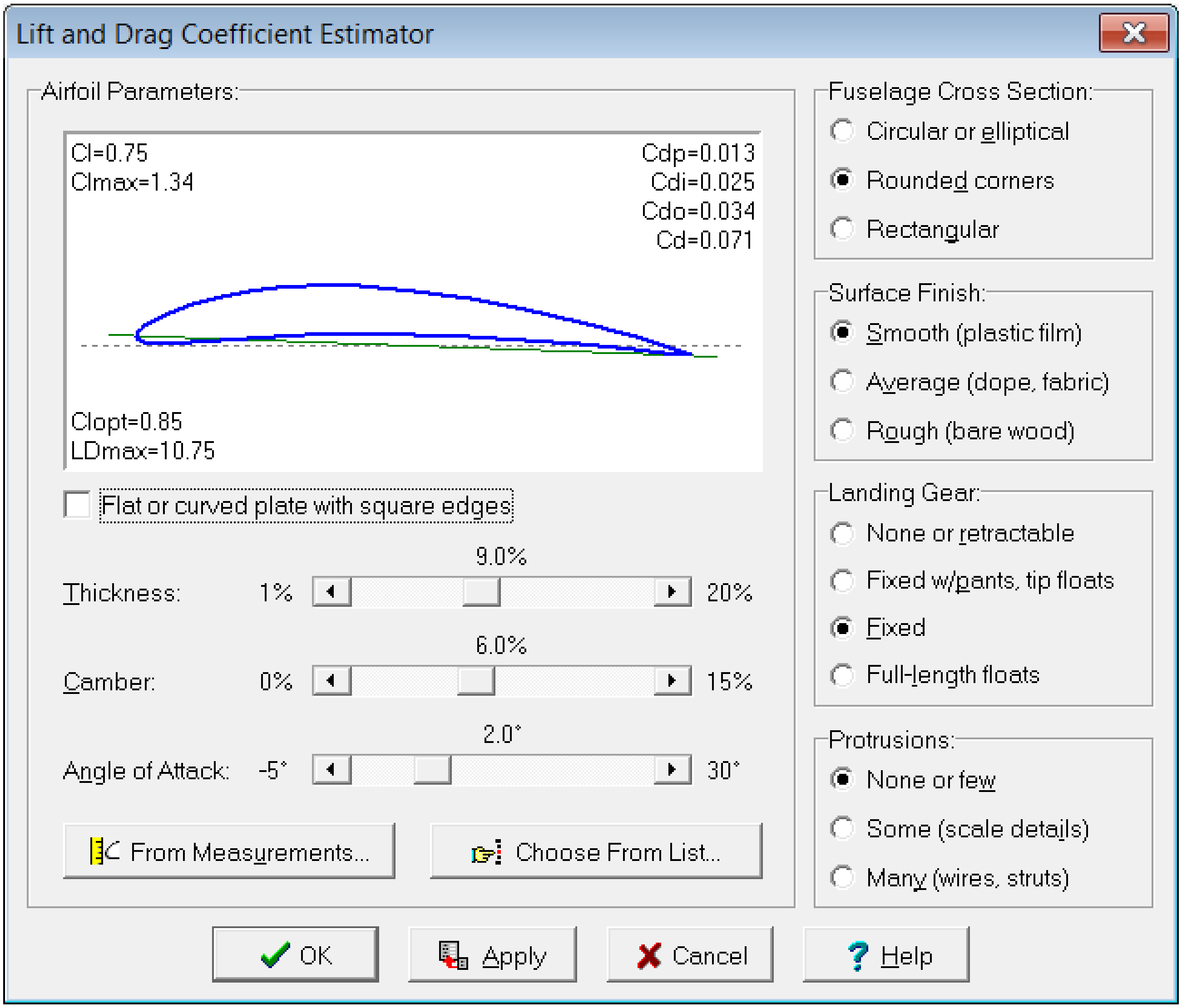
Getting the Right Propeller

Those of us who fly SAM competitions have a different set of requirements when selecting a propeller. Most of our events involve either climbing to the maximum altitude on a given battery or cruising for the maximum time. So, in the design phase of a new model we do an extensive analysis to find exactly the right motor/gearbox/battery and propeller to achieve these aims.

We start with an estimate of the model's all-up-weight then identify the battery capacity; our rules specify a capacity per ounce of weight so models of different size may compete on a fairly even basis. Then we begin the process of selecting a motor/gearbox/propeller combination. Most of us use the excellent MotoCalc computer program in this process. MotoCalc calculates all the performance parameters for the propulsion system and model aerodynamics ultimately predicting the rate of climb and duration of motor run time for a specific battery. Here is a screen shot of the input data. MotoCalc contains an impressive library of motors, ESCs and batteries to make this job easier. Dick Bartkowski has developed his own programs from the first principles of engineering physics and the seminal works of Ludwig Prandtl, Theodore von Kármán and probably Michael Faraday.



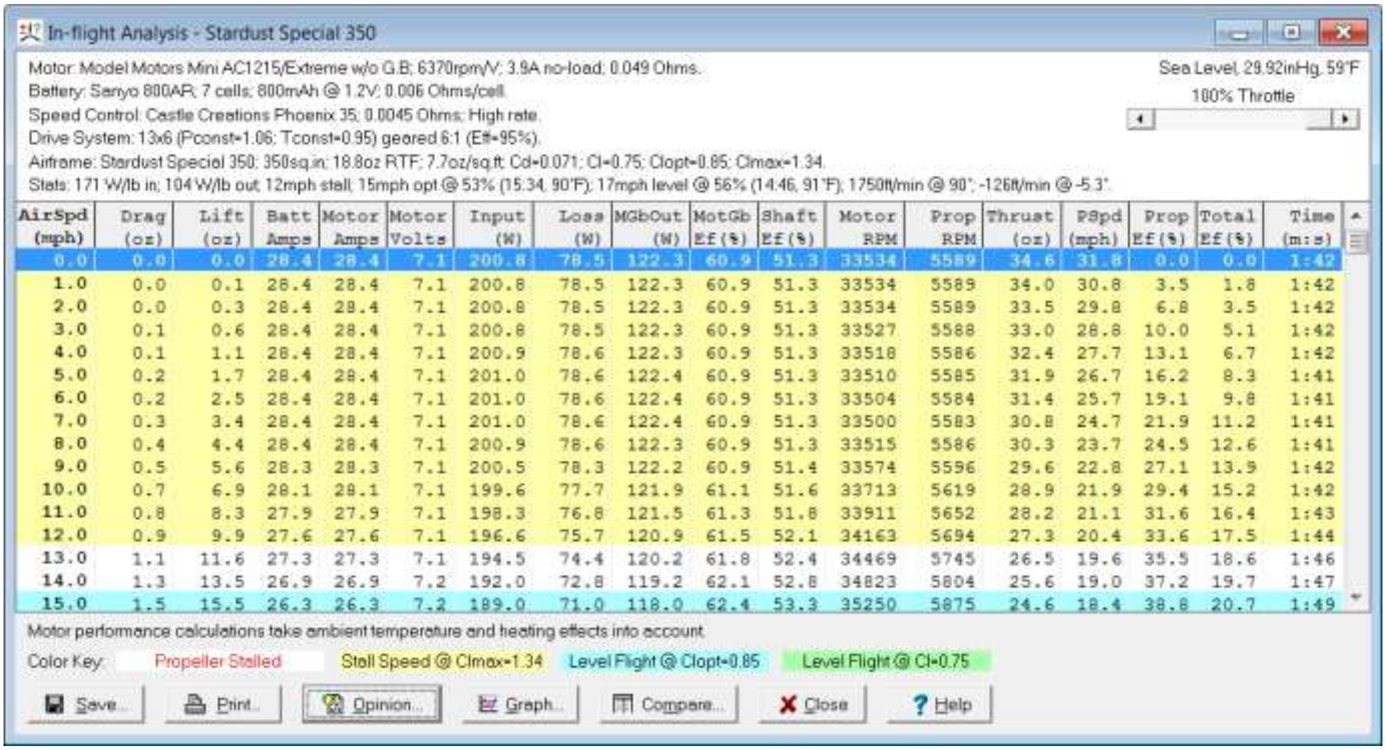
It also computes a fair estimate of the airplane's aerodynamics too. Here is a screen shot of the aero page. You start by selecting the airfoil and incidence then the main characteristics of the airframe and MotoCalc makes the estimate of lift and drag characteristics that are then used in the calculation of rate of climb, rate of descent and run time for a variety of propellers you select.



Now the flight parameters of interest to us SAM competitors are the rate of climb, flight duration, motor / battery current. We seek to achieve the maximum rate of climb in 90 seconds while staying within the motor safe limits. These are usually expressed in terms of current and armature rpm specified by the manufacturer.

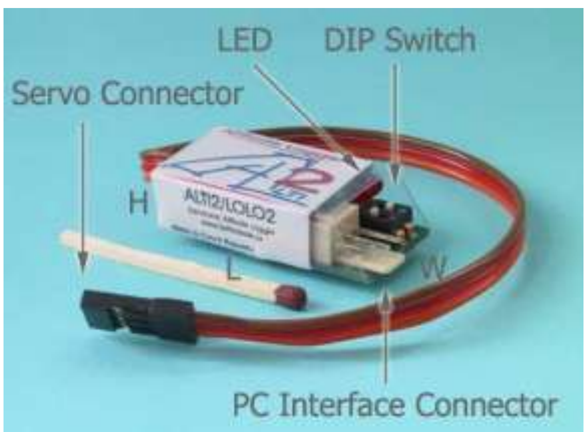
The process usually involves examining a wide variety of gear ratios for inrunner motors and props with different numbers of LiPo cells where the capacity is varied so as to stay within the battery energy rules. MotoCalc also predicts the glide performance so we may estimate the total altitude achieved in 90 seconds and the time to descend in still air. Of course in the real world we try to find thermals to stay up longer.

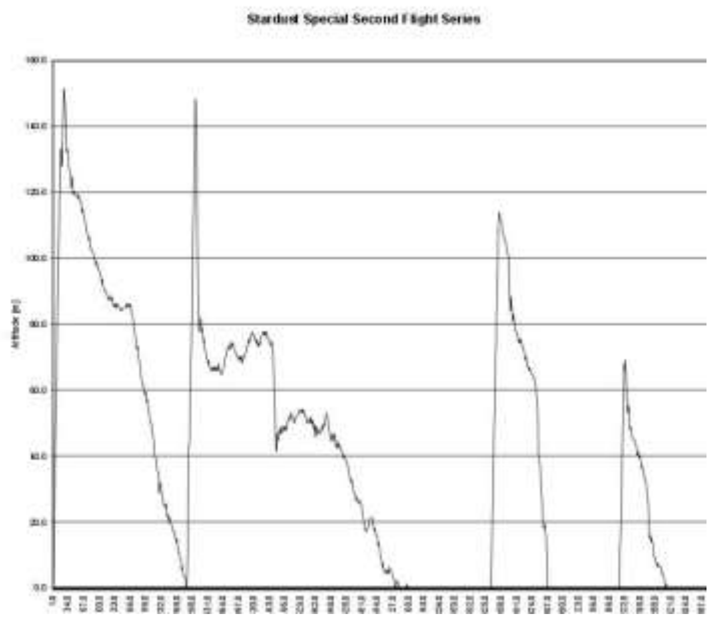
The analysis shown here is of my original 2003 Stardust Special with a Model Motors Extreme inrunner with a 6:1 planetary gearbox. The maximum rate of climb was achieved on a 13 x 6 Graupner folding propeller.



AirSpd (mph)	Drag (oz)	Lift (oz)	Batt Amps	Motor Amps	Motor Volts	Input (W)	Loss (W)	MGbOut (W)	MotGb Ef(%)	Shaft Ef(%)	Motor RPM	Prop RPM	Thrust (oz)	PSpd (mph)	Prop Ef(%)	Total Ef(%)	Time (m:s)
0.0	0.0	0.0	28.4	28.4	7.1	200.8	78.5	122.3	60.9	51.3	33534	5589	34.6	31.8	0.0	0.0	1:42
1.0	0.0	0.1	28.4	28.4	7.1	200.8	78.5	122.3	60.9	51.3	33534	5589	34.0	30.8	3.5	1.8	1:42
2.0	0.0	0.3	28.4	28.4	7.1	200.8	78.5	122.3	60.9	51.3	33534	5589	33.5	29.8	6.8	3.5	1:42
3.0	0.1	0.6	28.4	28.4	7.1	200.8	78.5	122.3	60.9	51.3	33527	5588	33.0	28.8	10.0	5.1	1:42
4.0	0.1	1.1	28.4	28.4	7.1	200.9	78.6	122.3	60.9	51.3	33518	5586	32.4	27.7	13.1	6.7	1:42
5.0	0.2	1.7	28.4	28.4	7.1	201.0	78.6	122.4	60.9	51.3	33510	5585	31.9	26.7	16.2	8.3	1:41
6.0	0.2	2.5	28.4	28.4	7.1	201.0	78.6	122.4	60.9	51.3	33504	5584	31.4	25.7	19.1	9.8	1:41
7.0	0.3	3.4	28.4	28.4	7.1	201.0	78.6	122.4	60.9	51.3	33500	5583	30.8	24.7	21.9	11.2	1:41
8.0	0.4	4.4	28.4	28.4	7.1	200.9	78.6	122.3	60.9	51.3	33515	5586	30.3	23.7	24.5	12.6	1:41
9.0	0.5	5.6	28.3	28.3	7.1	200.5	78.3	122.2	60.9	51.4	33574	5596	29.6	22.8	27.1	13.9	1:42
10.0	0.7	6.9	28.1	28.1	7.1	199.6	77.7	121.9	61.1	51.6	33713	5619	28.9	21.9	29.4	15.2	1:42
11.0	0.8	8.3	27.9	27.9	7.1	198.3	76.8	121.5	61.3	51.8	33911	5652	28.2	21.1	31.6	16.4	1:43
12.0	0.9	9.9	27.6	27.6	7.1	196.6	75.7	120.9	61.5	52.1	34163	5694	27.3	20.4	33.6	17.5	1:44
13.0	1.1	11.6	27.3	27.3	7.1	194.5	74.4	120.2	61.8	52.4	34469	5745	26.5	19.6	35.5	18.6	1:46
14.0	1.3	13.5	26.9	26.9	7.2	192.0	72.8	119.2	62.1	52.8	34823	5804	25.6	19.0	37.2	19.7	1:47
15.0	1.5	15.5	26.3	26.3	7.2	189.0	71.0	118.0	62.4	53.3	35250	5875	24.6	18.4	38.8	20.7	1:49

Of course the question is; "is this an accurate prediction"? I struggled with this back in 2003 and answered it by buying an altitude logger; the LoLo device made by Czech glider competitor Roman Vojteck;
http://lomcovak.cz/wp_eng/ http://www.lomcovak.cz/a2/a2.html
This ten gram gem plugs into a spare Rx channel and records altitude in one to five second intervals.





Once I received the unit I made a series of flight tests which immediately validated the analysis.
Here is the graph of the initial flights;
The chart shows four climb and glide segments.
The climb data shows a 1700 ft/minute rate while the glide is variable, probably for two reasons; first being some thermals shown in the second flight as maintaining altitude after the initial descent, looks like a dive to half altitude. The other reason is I was probably trying to set the best glide, overshooting in the pitch setting until getting it right.

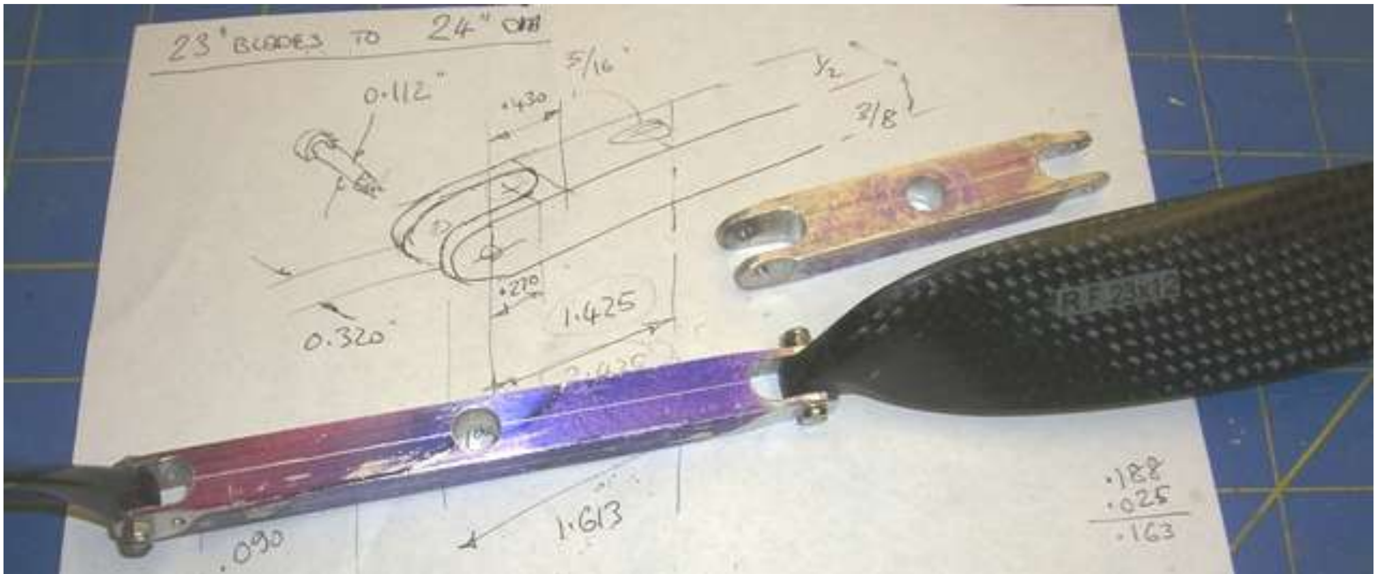
OK, so we have a method to select the best propulsion system design, but can we find all the bits to make it work.

The aerodynamically superior propellers are found in the glider prop providers; Graupner and Freudenthaler. They make (but Graupner just went bankrupt….) a wide range of folding props that include high quality design and manufactured composite blades that mate with aluminum
m "center parts".

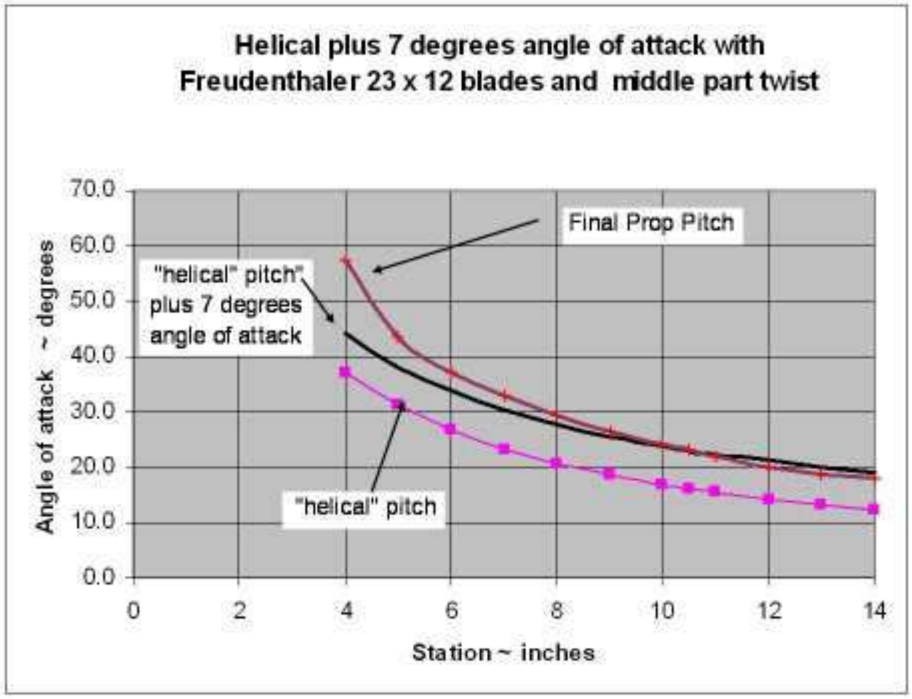
Rudy Freudenthaler makes two ranges of blades, one that is carbon reinforced injection molded plastic and the other high quality laid up carbon epoxy, the latter range, shown above, are quite expensive! Now what if you want something that is a little different to those available? Well, you can buy different middle part lengths and twists.

42mm Middlepart Yoke for 40mm spinner	47mm Middlepart Yoke for 45mm spinner	52mm Middlepart Yoke for 50mm spinner
		

You can also make your own middle parts with custom length and twist to fit existing blades in your stash. This has been particularly useful with the very large props I use on the Giant for the various competition classes and alternate motor / battery combinations. But to do this you need an essential tool; a Propeller Pitch gauge.



Custom 28 in Diameter x 30 in Pitch Prop



Years ago I bought one from a source in a column in Flying Models. I have used it for years and on many occasions other flyers have asked where to buy one. Unfortunately, the fellow who made them omitted to put his contact information on it. So recently I decided to make some for my contest flying friends. The above pictured "Dave's Pitch-a-Matic is the result.

"But wait" you cry. When you just change the diameter by moving the blades out you get the wrong twist. Well, maybe but as Michael Rennie said in "The Day the Earth Stood Still; " as the alien in the Professors office suggesting a solution to the vast astrophysics problem on the blackboard;

"*it is not an exact solution, but it is good enough to get us from one galaxy to the next".*

Somewhere along the line I bought two aluminum bars of the exact dimensions of the two primary middle parts so now I make my own to achieve the desired prop diameter. Initially I drilled the pivot bolt holes at the angle necessary to achieve the desired pitch, but I have subsequently realized it is much easier to twist the middle part in a vice. There is a related story here. At the 2010 Muncie SAM Champs I flew the Giant in the last event of the meet; Electric Texaco. I had made a special motor/gearbox assembly for the event and for reasons I do not understand it did not perform as predicted. As we had a laptop with MotoCalc on hand Dick Bartkowski suggested I change the motor for the very high performance one I had used in another event. But it would be necessary to run it on a much smaller but higher pitch prop; one we didn't have along. So I sorted though the prop blades and middle parts on hand and found a match for the diameter but it was woefully low on pitch. What to do? I certainly didn't have my 50 lb vice and solid oak bench with which to bend the middle part. But Chuck Kime said let me have a go and with an adjustable wrench and the aid or the chain link fencepost fitting he was able to crank in some pitch. It worked perfectly and we placed second with that last flight.

Months later I noticed the prop in the field box and thought I would check the pitch we achieved. To my astonishment I found there was a huge difference blade to blade; but it worked!

The last takeoff at the 2010 Muncie Champs with the "special" prop. Chuck holding, Dick timing