the Ampeer

February 1995 Page 1

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The Next Meeting: Thursday, Feb 2, Dublin Community Center on Union Lake Road, just north or the village of Union Lake, 7:30 P.M.

Thanks Debbie and Jim

Once again the McNeely's hosted the annual Holiday get-together. It was a wonderful night of friends, plane talk and eats. Considering that Jim had just had a major operation, we wish to extend our special thanks to the McNeely family for making the EFO family what it is - great! Debbie, there are no words of appreciation - we love you guys!

For those of you not in attendance, we literally traveled out of this world - try and think what that might mean!

See you all at the next meeting where Ken Myers has promised to bring in something very interesting, that isn't a plane, but can be very useful.

What's Happening?

Bruce McCreary, HC 63, Box 7187, 2 Hansa Lane, Snowflake, AZ 85937, asked whatever happened to the neat plane that would fly ten minutes plus of aerobatics that I had promised to get more information on. Well, I never got the expected information, but if you have been following my information on my version of the Senior Skyvolt, you should realize that this plane now fulfills this criteria. How did it happen? See my article "Crunching Numbers for a Sport Plane" in this issue. Bruce also commented that the Kyosho 9x8 electric prop, that I recommended, for his geared regular-size Skyvolt is outstanding - thought it would be! Bruce has an invitation out to those in his area to come visit and fly with him.

From: **Jim Marinelli Jr., 75 Rosen Ave, Torrington, CT 06790.** A few things that I thought you might be interested in. I have had great luck with B&T's 1700 SCRC's in my Mirage. It's been fun to fly a plane that gets around 13 minutes of flying, and flying it inverted at the 10 minute mark and looping it at the 12 minute mark!

I have found by swinging a 12x7 prop and cutting power on the down

What's in this issue? **Thanks Debbie & Jim! - Where's the 10 min. flier? - New E-Flight Magazine - Crunching Numbers for Sport & Sport Scale Models - NEAC? - New Big Belt Drive!!! - The Great**

side of any maneuver I can really save on the battery power! This is my real secret, but none of the guys believe me!!

The Mirage's flying abilities has caused the rest of the local flyers to either buy Mirages, buy better speed controllers or to buy (you guessed it) the 1700 SCRCs'. I ordered a batch for myself and some of the guys. You may already know this but B&T told me that there is going to be a shortage of the 1700's around Dec. 94. Also there is going to be a decent jump in the price! I checked with my contacts in the electronic industry and the "rumor" has it that the power tool industry is starting to use the fast charge cells. This seems to be the case because one our flyers is a contractor and his drill instructions say a charge takes place in 15 minutes.

I figured with higher volumes that would drop the price over time but I'm told this won't be the case!

I've been flying my 4 cell plane with Keith Walker's speed controller (nice and light and tiny with surface mount parts) and at 14 oz. the climb out was surprising! It flies with much more speed than I figured, probably the thin airfoil. Even with its' 34 inch wing I've flown it in some pretty good winds and it wasn't bad. I'm just finishing up on my Electric Hots that I scratch built using all contest grade balsa wood. All I had was the initial "prototype" blueprints and no construction article. They seemed to have made a few changes to the production unit compared to my blueprints! It's been a challenge. Also I plan on building a small twin using 2 AP29 motors on 10 or 11 cells this winter. I may even break down and buy one of the wing plotting programs for this plane. This should be fun! As always, great newsletter!

P.S. - Did you see Eloy Marez's article? This was the 3rd or 4th shot at E-flyers this year so I fired off a somewhat polite letter to him! (Only somewhat? humm km)

Mr. Peter H.Robinson, Orchard
House,
Strang,
Braddan,
Isle of
Man,
U.K., sent along a wonderful Christmas present - the issue No. 1 of *Electric Flight*! I mentioned this a few months back, when Martin Irvine sent along some info on it. Where to order: EFI Subscriptions, Traplet Publications, Ltd., Traplet House, Severn Drive, Upton-upon-Severn, Worcestershire, WR8 0JL, England Cost U.S. $30 for one year, $58 for two can be charged to VISA or MasterCard Phone: 0684 594505 along with the international code for England - I would suppose.

What's in it? Cover story, the four motored Hadley Page HP 42, with 30 1000 SCR cells and weighing 14 lbs., review of the Graupner Mini-

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Crunching Numbers to Build a Sport or Sport Scale Plane

by Ken Myers
1911 Bradshaw Ct.
Walled Lake, MI 48390
The Ampeer - Feb. 1995

1.) **Select a wing area**: It can be for an existing plane or proposed design. I will be using 580 sq.in. for my example plane. This is my version of the Senior Skyvolt.

2.) **Select the wing loading** you'd like: *Keith Shaw recommends "a wing loading that will be appropriate for the design type and size. For slow-flying planes, such as, WWI or 1920 - 1930 light planes (Cub, Taylorcraft, etc.), use a 14 - 18 oz./sq. ft. wing loading, but for fighters, aerobatic types and multi-motors, a 20-25 oz./sq. ft. loading is more appropriate. Small planes (less than 400 sq. in.) should use the lower wing loadings for their type. Select a good airfoil; my all-around favorite is the real Clark Y, as it has good load-lifting characteristics, reasonably low drag, and surprisingly good inverted performance. My Spitfire, deHavilland Comet, and Gee Bee use the Clark Y. For fast aerobatic types the NACA 2412 and 2410 work well.*" I like to use 20 oz./sq.ft (For a sport, or a sport scale, plane the acceptable wing loading can go up to 25 oz./sq.ft. Larger planes will tend to have a smaller number, twins tend toward the higher number. Both Keith Shaw and I have found that a 20 oz./sq.ft. wing loading makes

a good target.)

3.) **Find the estimated finished plane weight**:

a.) 580(wing area in square inches)/144 (sq.in. in a sq.ft) = 4.027 sq.ft.

b.) 20 (wing loading in ounces) x 4.027 (sq.ft) = 80.54 oz. (target weight)

4.) **Find the prop diameter**: (The prop diameter is equal to 100 to 150 oz. per square foot of prop disk area according to Bill Skipper.) Finding the diameter is a two step process:

a: First Number (FN) = (80.54(target weight)/150(from Skipper)) x (144 (sq.in. per sq.ft) / pi 3.1415927) FN = .5369333 x 45.836624 FN = 24.61121

b: Diameter (D) = (the square root of FN) x 2 D = 4.9609686 x 2 D = 9.9219372

Therefore the smallest diameter prop for this plane would be 10 inches, since the heaviest disk load was used. Refiguring, using the 100 ounces per sq.ft. of disk area yields 12.151842 or 12 inches. The prop range is 10 to 12 inches + . That is no real surprise.

5.) **Power for sport aerobatics** (per Keith Shaw) = 40 to 60 watts per pound of input power (2.5 watts per ounce to 3.75 watts per ounce) 80.54 x 2.5 = 201.35 watts to 80.54 x 3.75 = 302.025 watts. The input power then becomes 201 to 302 watts.

6.) **Picking a static amp draw**. *Keith Shaw says that "for the long motor runs that are common in sport scale, 15 amps is about maximum for ferrite motors, while cobalt motors can go up to 20 to 30 amps, depending on size. For short motor runs (less than one minute), many cobalt motors can stand 40 to 60 amps! I typically use a 20 amp static load for my scale planes; this gives me 4.5 to 5.5 minutes of good performance, or 7 to 10 minutes of just cruising around the sky.*" Since I generally use cobalt motors, I also have been using 20 amps. Through the years, this has been a very successful amp draw on sport and sport scale planes for me.

201/20 = 10.05 volts - 302/20 = 15.1 volts. Since Ni-Cads being used in this range deliver about 1 volt per cell, this means using a motor running on 10 to 15 cells. This indicates that the American made Astro Flight cobalt 15 or 25 with a gear drive would be a good choice! Great quality at a fair price. (Or any other motor that can run at 20 amps with between 10 and 15 cells.)

7.) **Figuring the weight of the power system**. Up to 50% of the total model weight can be power system. For our example that means 80.54/2 = 40.27 ounces can be power system (battery, motor and gear drive if used) . The other 40.27 ounces is radio and total plane weight. To figure out the weight of the power system, for 900 or 1000 SCR cells figure 1.5 oz. per cell for the finished pack and for 1200-1400-1500SCR or 1700SCRC figure 2.0 oz. per cell. Therefore:

25 geared system w/1000 SCR = 13 motor and gear box + (14 x 1.5) = 34 ounces

25 geared system w/1700SCRC = 13 motor and gear box + (14 x 2) = 41 ounces

The 41 ounces is acceptable. It will give relatively long, powerful flights. Using a radio weight of 8 (speed control is included with the radio) ounces leaves: 80.54 ounces (target weight of the plane) - 49 ounces (power system and radio) = 31.54 ounces for the rest of the plane.

8.) **What is the airframe going to weigh?** I have developed the following formulas and find they give good guestimates for up to 40 powered planes.

A.) Estimating the weight for a plane: The formula: Weight of the covered airframe, wheels, pushrods, etc. = (model length including rudder x fuselage area at the leading edge of the wing x .035) + (model's wing area x .019)

Using the formula: (model length 41 x cross-sectional area at the leading edge of the wing 4.125 x 3.25 x .035) + (wing area 580 x .019) = 19.237969 + 11.02 = 30.2557969 or about 30 ounces. We had 31.54 ounces to play with, so it can be built within the target weight. The predicted weight = (power system) 41 + (radio) 8 + (airframe 30.26) = 79.26 ounces. By the way, this plane exists and weighs 78 ounces. Not too bad and the actual plane weighs less than the target weight of 80.54 ounces. The predicted wing loading = 79.26 ounces/4.027 sq.ft. = 19.68 oz./sq.ft. Actual wing loading being 78/4.027 = 19.37 oz./sq.ft.

9.) **Finding the stall speed.** The stall speed for this type of aircraft, with a typical airfoil, is approximately = 3.7 x (square root of the (predicted weight 79.26 / area in sq.ft. 4.027)) = 3.7 x square root of 19.68 = 3.7 x 4.44 = 16.43 miles per hour.

10.) **Straight and level flight speed:** *According to Keith Shaw, "To do clean inside loops, rolls, and*

other sport aerobatics, three times the stall speed is needed." 16.43 x 3 = 49.29 mph. Checking this plane for lift to drag, with the Kress computer program, also suggests that a speed near 50 mph is much more efficient than 60 mph, as the drag rises rapidly between 50 and 60 mph. Therefore, a speed of near 50 mph is a good realistic speed with good efficiency.

11.) **Getting the prop pitch:** the Hobby Lobby catalog has a useful formula: prop pitch = (gear ratio) x (efficient airspeed in mph - read that straight and level flight speed from part 9) x 1805 / free RPM of the motor. For the example: prop pitch = 1.82 (gear ratio for the cobalt 25 & 40) x 49.29 (from above) x 1805 / 15291 (given by Hobby Lobby for AF 25). 1.82 x 49.29 x 1805 / 15291 = 161922.58 / 15291 = 10.59 or between a 10 or an 11 pitch. Keith Shaw states that aerobatic planes work best with a 1.3:1 to 1.7:1 to ratio pitch to diameter. The prop diameter range, chosen above, is between 10 and 12 + inches. The 10 and 11 inch diameters do not come close to a 10 pitch using the ratio 1.3:1. 12/1.3 = 9.23 better, while 13/1.3 = 10. For a starting point, I'd try either the 12x9 or 13x10. Can't swing a 13" prop, see note later about a "lawn mower".

12.) **Selecting the right prop:** The 13x10 has the pitch we were looking for. A quick check in the Kress computer program shows that the 13x10 should pull 20.2 amps (just what I am looking for) and a level flight airspeed of 47 mph (again what I am looking for).

13.) **Eek! I've crated a lawn mower.**

Using a 13" prop requires 6.5" for the prop and at least 1.5" of clearance for the grass. This means that the thrust line must be at least 8" above the ground. Many plans and conversions will not have this much clearance for this size plane. There are two solutions.

a.) **Simple solution:** Make the landing gear legs longer. I would not use larger wheels, since this induces more drag than lengthening the legs.

b.) **Not so simple:** Use more cells. Dropping back to a 12" diameter prop means using a 9 pitch while an 11" inch means an 8. Adding more cells raises the wing loading, but on larger size planes, this shouldn't be a problem. Adding one or two cells makes the 12x9 usable with the airspeed and amps about where they should be.

Hey Myers, what the h--- are you trying to tell me! Well, if you put all of this data into a spreadsheet, it is a lot easier to see how it works. Input the following data into your favorite spreadsheet. Save it under two names like: figureit and figitbak. Use figitbak for all of your work, until you accidently overwrite a formula, then you can load figureit and rename it figitbak and not have to find this article again and retype it. Don't say I didn't warn you.

You will have to format your spreadsheet's font and cell widths appropriately. Don't worry about an ERR message in cells. It will disappear when data is input.

A1 Electric Flight Worksheet: B1 Created by Ken Myers Jan. 1995
B2 Inputs:
A3 Wing Area: D3 Target Weight: E3 =(B3/144)*B4
A4 Wing Loading:D4 Prop diameter: E4 =SQRT(B17)*2 F4 to G4 =SQRT(C17)*2
A5 Static amp draw: D5 Prop pitch: E5 =(B13*E14*1805)/D18
A6 Motor & gear drive wt.:D6 Recalculated prop diameter: E6 =E5*1.3 F6 (see note 1)
A7 Cell weight: (see note 2) D7 Required Watts: E7 =E12*2.5 F7 to G7 =E12*3.75
A8 Known number of cells: D8 Cells required: E8 =E7/B5 F8 to G8 =G7/B5
A9 Radio weight: D9 Power System wt.: E9 =(B7*B15)+B6
A10 Fuselage length: D10 Max. airframe wt.: E10 =E3-E9-B9
A11 Fuselage height at LE: D11 Predicted airframe wt.: E11 =(B10*B11*B12*0.035)+(B3*0.019)
A12 Fuselage width at LE: D12 Total predicted wt.: E12 =E9+B9+E11
A13 Gear ratio: D13 Stall speed: E13 =(SQRT(E3/(B3/144)))*3.7
A14 No load RPM known: D14 Good Flight Speed: E14 =3*E13

A15 Number of cells to try: D15 Required RPM with cal. prop: E15 =(E14/E5)*1000
A17 Figure Prop Dia.: B17 =(E3/150)*45.836624 C17 =(E3/100)*45.836624
A18 Figure prop dia. for new number of cells: C18 =B14/(B8*1.35) D18 =C18*B15*1.35
A20 Notes:
A21 1. The recalculated prop diameter should fall in the calculated prop diameter range or above.

A22 2. For 900 or 1000 SCR cells figure 1.5 oz. per cell and
A23 for 1200, 1300, 1400, 1500 SCR or 1700 SCRC figure 2 oz. per cell

To proof your spreadsheet:
Input the following:
Wing Area: 580 Wing Loading: 20 Static amp draw: 20 Motor & gear drive wt.: 13 Cell weight: 2
Known number of cells: 14 Radio weight: 8
Fuselage length: 41 Fuselage height at LE: 4.125
Fuselage width at LE: 3.25
Gear ratio: 1.82 No load RPM known: 15291
Number of cells to try: 14
The results should be: (note that how may decimal places you see will depend on how you've set up your spreadsheet.)
Target Weight: 80.556 Prop diameter: 9.9229 to 12.15 Prop pitch: 10.665
Recalculated Prop diameter: 13.864 Required Watts: 198.15 to 297.22 Cells required: 9.907 to 14.861
Power system wt.: 41 Max. airfram wt.: 31.556
Predicted airframe wt.: 30.258
Total Predicted wt.: 79.258 Stall speed: 16.547
Good Flight Speed: 49.641
Required RPM with cal. prop: 5348.8

You can use the fixed format to set the decimal points in the results. For example Prop diameter fixed at 0 decimal places yields 10 to 12. You can decide which ones to which decimal place.

Some explanations:

Recalculated prop diameter: recalculates the prop diameter when the cell count varies. Cell count can be varied at the Number of cells to try: input

Known number of cells: the number of cells used to collect initial data, either by you or the manufacturer.

Radio weight: includes the weight of the speed controller

Good Flight Speed: three times the stall speed.

Number of cells to try: first input the Known number of cells, but you can then vary your data by entering a new number of Ni-Cad cells here.

Gear ratio: use 1.0 for direct drive

Required RPM with cal. prop: the motor must turn at least this rpm with the calculated prop to fly near the desired speed.

Why does the spreadsheet recommend almost a 14" prop?

The input for the no load RPM used was taken from the Hobby Lobby data for the Astro Flight 25, while my own data showed a no load RPM of 17,600 on 15 cells. Using my data brings the 14 cell RPM to about 16,400. On the spreadsheet, input 16400 to replace 15291. When 16,400 replaces the 15,291 RPM of Hobby Lobby, then the prop diameter drops to 12.927 or 13 inches, as stated in the text. What does this mean? Use printed data, including my own, with a grain of salt, but for getting you into a ball park, it should be close enough until you actually get your hands on the motor you think you'd like to use.

Something else to try:

Once you have changed the no load RPM to 16400, change the Number of cells to try: to 15. You'll now see the prop I am using on my plane - 12x9.

What's Missing?

Some of this information makes assumptions that you know several things, such as; can the real motor turn the chosen prop efficiently at the appropriate rpm, is the airfoil efficient, at what speed and more? My recom-mendation, for sport aerobatic-sport scale planes is to stick with the above recommendations for plane and airfoil and use Astro Flight non-FAI motors. This combination will definitely provide very successful electric flight.

Add the Kress Jets, Inc. program to your design arsenal, gather as much motor data as you can to help in the selection of the power system, use short lengths of good quality wire, Sermos or Astro Flight connectors, an efficient high rate speed

control, Sanyo 1700 SCRC cells (if possible), solder your own packs (or use SR packs), select your design and wood carefully, and use a radio system as small as possible that will ***safely*** control your aircraft, then you will have a very successful electric sport aerobatic/sport scale plane with duration in the 7 to 10 minute range.

If you don't want to type in the spreadsheet, I have it as a Micro-soft Works spreadsheet file and text version, along with a lot of other very good electric flight information including a magazine database and various versions of my design and prediction program on disk and lots more interesting electric flight data. It is available on a 3.5 inch high density IBM compatible floppy. My program and some others are on the disk as .exe

From the Dec. '94 *Silents Please* word of the formation of NEAC - Larry Sribnick & BEGIN-AIRE - Jay Putt

NATIONAL ELECTRIC AIRCRAFT COUNCIL

I've been working on the form-ation of the National Electric Aircraft Council, "NEAC", for almost six months now. It's finally time to bring all of you up to speed and ask for your help.

The NEAC is a council of AMA Clubs, not individ-uals, from all over the country whose members have a genuine interest in Electric Flight and Electric Flight Competition. The main purpose of the NEAC is to act as the AMA "SIG" for Electric Flight. As the AMA SIG for Electric Flight, the NEAC would advise the AMA in all matters regarding Electric Flight Competition. In effect, the NEAC would be a single voice that would speak for Electric Fliers all over the country.

We are presently faced with a perfect example of how the NEAC might help all of us. The AMA has decided to not have any Electric Events at the '95 Nationals. I assume the AMA made this decision because of poor attendance in Electric Events at recent NATS. It is possible that the NEAC, speaking for Electric Fliers all over the country, could suggest an alternative site and possibly even the date, where the member clubs of the NEAC could conduct the Electric NATS for the AMA. I have not discussed this with the AMA, but it is the kind of activity in which the NEAC would be involved.

Before I go any further, please let me note that all of this has nothing to do with SR Batteries. I'm writing as a modeler for over 40 years, an Electric Flier for over 17 years, an AMA CD, and as the AMA District II representative to the AMA's Electric Contest Board. Although I am very active in SEFLI, the Silent Electric Fliers of Long Island, they haven't been involved in this proposal and will receive it at the same time as the rest of you. I believe that modeling companies have no place in the NEAC and their involvement was one of the reasons for the lack of success of past attempts to form a national SIG for Electric Flight. If someone from a modeling company is a flier, is a member of a NEAC club, and is selected by that club as their spokesman, they are more than welcome on the Council as a modeler, not as a representative of their company.

Here is how it all works. The NEAC would have no power, no money, and hopefully, no politics. It is simply a forum where we could share ideas and problems and hopefully, arrive at some kind of consensus as to what the majority of Electric Fliers would like. Each member club selects an individual whose responsibility is to act as a conduit for information between the NEAC and the member club.

When the club's representative speaks, he or she is speaking for their club, not themselves. In order for a club to become an Associate Member of the NEAC, a member club must have at least five members who are involved in the flying of Electric powered aircraft. The club itself doesn't have to be an all Electric club; it simply has to have members who are active Electric Fliers. In order for a club to become a full, voting, member of the NEAC, a club must have at least 10 members actively involved in the flying of electric powered aircraft. Each club has a single vote on the Council. At first, I thought this wasn't fair as one club might have 100 members and another club might have only 10 members.

However, my experience has been that if a club has 10 members, it has 10 active, flying, members. If a club has 100 members, it still has only 10 or 12

active, flying, members.

How to include the thoughts and opinions of Electric Fliers who are not affiliated with a particular club is an interesting problem. As I see it we have at least three possible solutions to this question. First, there's no reason why they can't communicate with the NEAC as individuals. Second, the member clubs could offer "affiliate" memberships at a reduced cost so that they would at least cover the cost of mailings to the affiliate member. Third, we could designate one member of the Council as representative of non-club affiliated fliers in affect creating a club for them within the Council. They would have to pay dues to this newly created Council Club to handle mailing costs but that would all be handled by that Council Club, not the NEAC itself. One of the first decisions to be made by the NEAC is to decide on how to include non-club affiliated fliers in our discussions.

The key to the success of the NEAC is to keep it simple. That's why I said, "no dues, no power, no politics." We don't need dues because any costs incurred by a member club will be paid by that member club. No power because the NEAC is an advisory Council. We can't force the AMA to do anything they don't want to do. Of course, there is nothing to stop us from doing anything we want to do
on our own. Lastly, no politics. The NEAC must be truly national-ly representative. If it is to suc-ceed, it can't be perceived as being an East Coast or West Coast group, or any other classification that would divide the membership into one group against the other.

The NEAC's activities are coordinated by a Chairperson and Co-Chairperson. These positions hold no special powers and their responsibility is to simply better coordinate communications and the activities of the NEAC. To keep things simple, the Chair-person is also the Secretary. There is no Treasurer as there is no money but that position could always be added if it becomes necessary. The Chairperson and Co-Chairperson positions are elected by the members of the NEAC and have terms of two years.

As for communications between the Council Represent-atives, I have come up with a unique way for the NEAC to keep in touch. I have arranged for E Mail service for the NEAC. Rather than time consuming letters and phone calls, we can just leave E-Mail messages to be read by any and all members of the Council. All each club would have to do is identify one member (normally the club's representative to the Council) with a computer and modem and I'll do the rest. The cost of the E-Mail service is free or almost free. I'll give you all the details latter.

Hopefully, you want your club to join the NEAC. To do so is easy. First, discuss it with your club and see if they want to join. Next, send me the name of the club, its AMA club number, total membership. and number of Elec-tric Fliers. I'll also need a club roster including the AMA number of each member. In addition, I'll also need to know who the club's representative to the NEAC will be and I'll need their name, address, and phone number so that I can keep in touch and get everything going.

There's a very good chance that we can have the NEAC recognized by the AMA as the Electric Flight SIG at the January meeting of the AMA's Executive Council, but to do so we have to work quickly.

Call me if you have any questions, 516-286-0079 and get the information and rosters to me ASAP! I'd really like to try to save the Electric NATS this year. (Since Larry wrote - NEAC will coordinate the electrics NATS, at Muncie, June 23-27 - 1995!)

Ken Welch's Electric Swept-wing Glider

A while back I asked if anyone knew what Ken's plane was. Keith Shaw called to say that it is probably a Graupner Cumulus.

CS Flight Systems

It has been quite a while since I last mentioned Charlie and his electric flight supply business. He carries a full stock of Astro Flight equipment & parts, as well as Leisure motors & parts.

MODELAIR-TECH
R/C Model Aircraft Products and Engineering
P.O. Box 12033
Hauppauge, N.Y. 11788-0818
Phone: 516-979-1475

Dear Ken,

I was very glad to hear from you the other night You have the distinction of placing the first business call to MODELAIR-TECH. I will have to thank our friend, Dave Durnford for the announcement.

As I mentioned to you, we think we have something better with our H-1000 belt drive assembly. First of all it can handle a variety of the larger size motors, including the Astro 25/40, Speed-700, the smaller Aveox series and many of the German "Ultra type" motors, just to name a few. The motor is cleverly supported at several points for added strength, but it is still a "universal" type mounting scheme. Best of all we are offering three reduction ratios of 2.57, 3.0 and 3.6 to 1. By swapping pulleys you can actually change this belt ratio at the flying field.

Please note that the units shown in the photos were hand made protoypes. The final production units will be injection molded.

In addition to the single motor unit, we will have a dual motor belt reduction drive assembly. This is made up of two joined single units, as you can see in the drawings and photos. We envision a dual unit with two inexpensive Speed-700 motors powering a 1/5 or 1/6 scale Cub or the like. It will also be possible to fly 1/4 scale size models with Astro 25/ 40's.

As for pricing, we have tentatively set up the following schedule. Both belt drive units will be basically sold unassembled. Assembly takes very little time and shouldn't be a problem. The initial list price is $64.95 plus $4.00 for shipping for the single unit. Add $5.00 to that and we will fully assemble the unit. Send us your motor with your order and we will mount it to
your belt drive. The unit is shipped with your choice of reduction ratio.

If you find you selected the wrong ratio, send us back your pulley, we will swap for just the cost of postage. Additional pulleys can be purchased for $5.00 each plus a nominal postage fee.

The H-1000 dual motor unit will list for $99.95 plus $4.00 shipping.

As soon as they are available I will be sending you our new brochure/catalog/price listing. In it we will initially be offering Tom's PUCARA, BEECHCRAFT D-18 and Republic A-10 twins in semi-kit format (vacuum formed parts, foam cores and full size plans). We will also have plans only of a 630 square inch electric KERSWAP old timer. Within a month or so we also hope to have plans for a new Electroslot- 400 electric sailplane powered by a Speed-400 motor, which we call the "ES-400". Our goal is to create a new Class 1/2A Electric Sailplane event around this size model and motor. In addition, we expect to have out a new Class-A/B electric sailplane, to be called the "DEFIANT". Like the ES-400 it will initially be all wood construction (plans only). Later we might kit to semi kits with fibreglas fuselages and pre-cut wing ribs. The DEFIANT will have the same fuselage, motor and tailplane. The Class-A and Class-B wings are basically the same format, the "B" being somewhat larger (in area and span). Both wings can be configured for either straight dihedral or dihedral with poly at the tips. You will also have a choice between rudder/elevator control or aileron/ spoileron/elevator control. Class-A will be flown on 7 cells, while Class-B will use 10-12 cells for power.

I might also tell you that as a sideline venture (not part of MODELAIR-TECH) I just finished a new book, which tentatively will be titled, "The Exciting World of Electric Flight". I did this in collaboration with Frank Fanelli my Assoc. Editor at FLYING MODELS. I did the writing and Frank is now editing and scanning in all the photos As soon as we get a publisher (FM wouldn't get involved!) I'll let you know more of the details.

Both Tom and I have been very busy people of late. Tom is still at Grumman and will likely be there until at least this June. In the mean time I'm going to try to make a go of this business and build on it to keep a pay check coming in I'm continuing to write my two articles a month for FLYING MODELS. You wouldn't believe what my little basement looks like.

Sincerely,
Bob Aberle

The Following is from the Instruction and Assembly Sheet
H-1000 SINGLE MOTOR VERSION

Thank you for purchasing the H-1000 or H-1000D belt drive. This is the only unit on the market today that can accommodate a variety of large size electric motors providing a practical choice of prop speed reduction ratios. It has the ability to absorb 1000 watts of motor power. The unique belt/pulley system makes it easy to change reduction ratios at the field. As an option, with certain additional parts, it is also the only belt drive capable of having two motors drive a single output shaft e.g. two motors turning one prop shaft.

The H-1000 is available in ratios; 3.6/1, 3.0/1 and 2.57/1. (Sorry, the 3.6/1 ratio is not available on motors with a 1/4" output shaft (Astro 25 and up). Custom ratios can be made available at additional cost. A major feature of the H-1000 is its ability to accept a wide variety of motors (sizes and types, e.g. ferrites, cobalts, neodym and brushless). If for any reason your motor does not adapt easily to the H-1000, please give us a call. We can either advise you of any modification right on the phone or we can perform the work for you at a modest extra charge.

H-1000D Dual Motor Version

The option to assemble this unit (with extra parts) into a dual motor single output belt reduction unit is a unique one. Assemble as before one unit as above with the exception the nylon pull tie.

If your motors are advanced timed for direct drive applications, one motor will have to be retimed for reverse operation. This motor will be made to run backwards by you wiring scheme. The motors can be run in parallel or in series. This you will have to decide. But one must run in reverse or all you will have is a lot on smoke in your shop!!

Mount the unit in the airframe using a pair of hardwood beams secured to the splice plates on the centerline of the prop shaft. Four 6-32 screws are recommended (2 per beam).

Maintenance

The only maintenance necessary to the unit is an occasional inspection of the belt tension. The ball bearings are grease filled, double sealed type and should not be lubricated externally. Tightness of all set screws and bolts should be checked regularly. The smoothness of operation of

ModelAir-Tech single drive unit with what looks like an Aveox mounted.

Single and Dual drive units.

Sorry about the small type but had to fit in this

AI/Robotics - Maker of the FX35D Speed Control - Has Moved:
New Address: 1440 Third Street, Unit 4, Riverside, CA 92507 Tel.: (909) 369-9693 Fax: (909) 369-9694

Oh Whatta Night!

The January meeting started with **Bob Blau** show-ing his great aerial shots taken a Pontiac Miniature Aircraft Club in Waterford, MI. **Bob's** plane is a 40 powered Goldberg Anniversary Cub. He used a couple of cameras. One was the disposable kind, the other a Focal band, automatic advance type. They both worked well. The heavier, Focal, added 10 oz. to the weight of the plane, but didn't affect the flying in any way and provided superior clarity. (See a few of **Bob's** shots on the back page. I know that the printing has not done justice to these great color photos, so use your imagination.

There were two guests present, as well as a very good turnout of regulars. **Bill Brown**, Midwest R/C member, and owner of two electrics - a twin Commanche and Poterfield - and **Dave Weatherup** of Taylor, MI, joined us. Dave brought along some of his peanut scale planes with the idea of being able to do a little flying, as was done by **Jack Lemon** with his interesting fleet of indoor models. Unfortunately for us, our meeting place wasn't "high" enough for **Dave**.

After a round-robin of what was happening with the members, Jack did put on his flying demonstration. He had several interesting models including; a balloon powered helicopter, twin prop flying stick, a rubber powered helicopter and several ROG indoor models. The indoor models are covered with condenser paper and are extremely light. They fly beautifully and we were totally enchanted. **Jack** also had planes for his very efficient paper props and his indoor model. I think we have some real interest here now! **Dave** spoke to several of us about his peanut scales, as we admired the little gems.

This was one of the longest and best meetings we have ever had and a special thanks to **Jack** and **Dave** for an entertaining and informative evening.

The next meeting will be at the Dublin Community Center, Union Lake, on Thursday, Feb. 2, at 7:30. **Ken** says that he has something special for us, that's not a model, but that we will find very interesting!!!

Up and Away
Jack Lemon launches his balloon powered helicopter.

Look Ma, It's Twins!
Jack holds his twin flying straw with two very efficient paper props!

Micro Fleets