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Offer a 10% discount to CADMAC Members on all new aero modelling items. A current membership card must be shown.

Contact: Alan Wickham on 01243 864727

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57 - 59 Broadwater Road, Worthing Offer a 5% discount to CADMAC Members on some items. A current membership card must be shown. Tel: 01903 207525 smc@sussex-model-centre.co.uk

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The articles and views expressed by our members, are not necessarily the views of the editor or committee and therefore we reserve the right to modify and or refuse an article if it is considered in the best interest of the club.



bitten by the bug!

CHICHESTER AND DISTRICT MODEL AERO CLUB - APRIL 2003

Chichester and District Model Aero Club

Committee 2003

CHAIRMANPeter Sackman01243-373041SECRETARYBobby Bowry01243-780949Email address:bobbycadmac@freenet.co.ukTREASURER & MEMBERSHIP SECRETARY
Alan Misselbrook02392-470871

TRAINING & SAFETY OFFICER Tony Chant 01243-828506 **COMPETITION SECRETARY Ray Beadle** 01243-670163 THORNEY REP Harry Walton 01243-788417 PORTHOLE FARM REP Mick Blundell 01243-670791 SLOPE REP Ron Hemblade 01243-572819 02392-593104 BMFA RFP Ken Knox (As a non-committee member) John Riall 01243-782922 01243-780949 SOCIAL SECRETARY Trevor Bowry 07754-390270 WEBMASTER & JUNIOR REP Richard Farren FDITOR Bruce Smith 01243-531602

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All items for the newsletter should be submitted to:

Mr. Bruce Smith,

The Aylings, Queens Avenue, Chichester, West Sussex, PO19 8QB Email Address: aerobruce@aol.com

> Visit the club's excellent Web Site, http://cadmac.virtualsite.co.uk

Cover photograph:

The young editor checks the washout angle on his granddad's ED 2cc Comp Special powered Frog 45. (circa 1947)

car sharing and is in my view its far more interesting than Sandown though there's no flying, but that can be pretty boring especially if you are not on the sticks

Balsa Brain

Balsa Brain was hosted by Lee Bees at their Gosport meeting rooms on the 27th March. Unfortunately a senior moment occurred and I forgot all about it on the day!

Anyway six teams took part they were from the following clubs:

- Lee Bees
- Petersfield
- Portsmouth

- Southampton
- RENMA
- Winchester

I am told the question were of good quality and the food for the supper (Supplied by the host team, the winners of last years event) was excellent.

Winchester won with 44 points and Petersfield came second with a score of 42 (A close shave), so the venue for next year's comp will be Winchester. Perhaps we can field team next year?

FOUND

At the 3 Kings March Fly-in - 30th March - Croyden Enamel CADMAC Badge. Contact Dick Stepney 01243 250936

FOR SALE

Irvine 40 and Irvine 53 engines Contact: Mick Pearse on 01243 530 407



Captain Crash and the Crew have brought the aircraft to a screeching halt against the gate. And, once the tyre smoke has cleared and the warning bells are silenced, we'll open the door and you can pick your way through the wreckage to the terminal".

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Part of a Flight Attendant's arrival announcement: "We'd like to thank you folks for flying with us today. And, the next time you get the insane urge to go blasting through the skies in a pressurised metal tube, we hope you'll think of Qantas".

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A plane was taking off from Sydney Airport. After it reached a comfortable cruising altitude, the Captain made an announcement over the intercom, "Ladies and Gentlemen, this is your Captain speaking. Welcome to Flight No. XYZ, non-stop from Sydney to Auckland. The weather ahead is good, and therefore, we should have a smooth and uneventful flight. Now sit back and relax - "OH, MY GOD!".

Silence followed and after a few minutes, the Captain came back on the intercom and said, "Ladies and Gentlemen, I am so sorry if I scared you earlier, but while I was talking, the Flight Attendant brought me a cup of coffee and spilled the hot coffee in my Iap. You should see the front of my pants!". A passenger in Economy said, "That's nothing. He should see the back of mine!".

News from our BMFA Rep.

Just a short note about Yeovilton which was held on the 22nd February. The event was held in all the public halls of the museum and is their biggest day apart from Air-Day. The car parks were full and the MOD had to park the overflow across the road. All the spaces around the aircraft were occupied by all sorts of modelling paraphernalia from tanks to trains. There was something from all disciplines, all beautifully made and displayed.

There were trade stands for all. ranging from magazines to kits and all amongst the beautifully kept historic aircraft. The BMFA display, which is what I was involved with. was set in the school class room in the museum. The school has a full time teacher on site. Julia Hodgeson. She has a wellequipped classroom in which she teaches visiting schools from all over the South. In the class Doreen and Andrew Palmer (BMFA Southern Area treasurer) and others set up about ten tables for visiting children to build the BMFA "Dart." Many were made (45) and the resident teacher also buys three or four dozen kits for use during the year. BMFA also supply a good model flight simulator - very effective using the school's overhead projector.

I strongly recommend people visit this show next year. It's not too difficult to get to, especially with a bit of

Editorial

PORTHOLE GATE ALL IS REVEALED

No, it wasn't an April Fool, but the dog named in my comments following Mick Blundell's notice last month was in fact the four figure combination to the Porthole farm gate lock. Committee didn't think it too clever an idea to publish the numbers, so I wrote it as an alpha-numeric code: A=1 B=2 C=3 etc.

DODGY PHOTOS

Clearing out the attic a few weeks back I came across a box of old photos including the item emblazoned across this months cover. In fact I'd been searching for it for some time since I decided to take up the hobby again and was quite ecstatic at the discovery. It instantly conjured up magical memories of the Aladdin's cave which was my granddad's garage and that wonderful aroma of diesel fuel which hung there.

This set me to thinking. We've had some excellent articles lately recalling members' first experiences of 1:1 flying and there must be some wonderful tales, out there, of members' first brush with aero modelling along with some really dodgy photos. Come on, let's be 'avin' 'em. I've put myself up for ridicule - show us yours - and if you're wearing flares or a sailor suit, so much the better!

FREE PICS

While we're on the subject of photographs, it occurred to me that if vou're on the web, vou might like copies sent down line of photos printed in CD. I intend to embed all the article photographs as 'ipgs' and then, year at a time, clear out the pc by burning all the past year's CD files onto CD ROM. So if you ever want a quality photograph of anything from the magazine just send me an email giving a brief description along with the mag's year, month and page and I'll be only too pleased to upload it to you. If on the other hand you're submitting photographs and you'd rather that they weren't made freely available then please just let me know that that's the case. It goes without saying, of course, that the originator has all rights as far as the club's photographic competition is concerned. Speaking of which, if you're a new member, you might not be aware of this competition. The theme this year is, 'The Spirit of CADMAC.' and we've made Tony Chant the judge so that he can't win the Trophy outright! Entries will be judged at the club's AGM so you've got the whole summer and autumn to put the old box brownie to work and help ensure this year's comp has a record entry. Photos can be b/w or colour, processed or digital in origin and we're not looking for professional quality.

Just capture the moment!



Chairbourne

I would draw to the attention of all members to Rule 7.1 of the Club Pilots Handbook, which requires all members checking in at the Thorney Island Gate House to present their CADMAC membership card attached to which must be a passport type photograph of themselves. This is a security arrangement agreed by the Club with the Army. It is important that we comply with this requirement, particularly at this sensitive time.

It would also be prudent, during this period of heightened security, to carry a secondary form of ID. Thanking you in advance for your co -operation.



Ramblings from your Social Secretary

Short one this month just to remind you that the closing date for taking bookings to **Sandown is this Thursday, 10th. April.** We will be pushing it a bit to get a minibus at this late day but we will try. Please see me at the normal magazine pick up point.

Also, if you need to book or pay for some tickets reference the Skittles evening next month do this on the same evening. Last date for purchasing tickets will be the end of the Month.

As I said, Short one this month, safe flying and best regards,

Thenor,

INDOOR FLYING

MANHOOD COMMUNITY COLLEGE, SELSEY. First Thursday of the Month.

WESTBOURNE HOUSE SCHOOL, OVING. Third Thursday of the Month

Mick Blundell - Porthole Rep.

New flying times for Westbourne - 20.00hrs to 22.00hrs

emergency water landing, please paddle to short and take them with our compliments".

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"Should the cabin lose pressure, oxygen masks will drop from the overhead area. Please place the bag over your own mouth and nose before assisting children ... or other adults acting like children".

÷

"As you exit the plane, make sure to gather all of your belongings. Anything left behind will be distributed evenly among the Flight Attendants. Please do not leave children or spouses".

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And from the pilot during his welcome message, "Qantas Airlines is pleased to have some of the best Flight Attendants in the industry. Unfortunately, none of them are on this flight!".

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Heard on Qantas Airlines just after a very hard landing in Hobart: The Flight Attendant came on the intercom and said, "That was quite a bump, and I know what you are all thinking. I'm here to tell you it wasn't the Airline's fault, it wasn't the Pilot's fault, it wasn't the Flight Attendant's fault ... it was the asphalt!".

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Overheard on a Qantas flight into Perth, on a particularly windy and bumpy day: During the final approach, the Captain was really having to fight it. After an extremely hard landing, the Flight Attendant said, "Ladies and Gentlemen, welcome to Perth. Please remain in your seats with your seat belts fastened while the Captain taxis what's left of our airplane to the gate!".

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Another Flight Attendant's comment on a less than perfect landing: "We ask you to please remain seated as Captain Kangaroo bounces us to the terminal".

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An Airline Pilot wrote that on this particular flight, he had hammered his ship into the runway really hard. The Airline had a policy which required the first Officer to stand at the door while the Passengers exited, smile, and give them a "Thanks for flying Qantas". He said that in the light of his bad landing, he had a hard time looking the passengers in the eye, thinking that someone would have a smart comment.

Finally everyone had gotten off except for a little old lady walking with a cane. She said, "Sonny, mind if I ask you a question?". "Why, no Ma'am", said the Pilot. "What is it?". The little old lady said, "Did we land, or were we shot down?".

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After a real crusher of a landing in Sydney, the Flight Attendant came on with "Ladies and Gentlemen, please remain in your seats until

The Pilot Said...

More OANTAS mayhem courtesy of Jerry Devenish.

On a Qantas Flight with a very 'Senior' Flight Attendant crew, the Pilot said "Ladies and Gentlemen. We've reached cruising altitude and will be turning down the cabin lights. This is for your comfort and to enhance the appearance of your Flight Attendants".

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On landing, the Hostess said, "Please be sure to take all your belongings with you. If you're going to leave everything, please make sure it's something we'd like to have".

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There may be 50 ways to leave your Lover, but there are only 4 ways to leave the aircraft

≁

"Thank you for flying Qantas. We hope you enjoyed giving us the business as much as we enjoyed taking you for a ride"

≁

As the plane landed and was coming to a stop at Canberra, a lone voice came over the loudspeaker. "Whoa, big fella. WHOA!".

After a particularly rough landing during thunderstorms in Adelaide, a Flight Attendant on a Qantas flight announced. "Please take care when opening the overhead compartments because, after a landing like that, sure as @#&% everything has shifted"

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From a Qantas employee, "Welcome aboard Qantas Flight XXX to YYY. To operate your seatbelt, insert the metal tab into the buckle, and pull tight. It works just like every other seat belt, and if you don't know how to operate one, you probably shouldn't be out in public unsupervised".

"In the event of a sudden loss of cabin pressure, masks will descend from the ceiling. Stop screaming, grab the mask, and pull it over your face. If you have a small child travelling with you, secure your mask before assisting with theirs. If you are travelling with more than one small child, pick your favourite".

"Weather at our destination is 50 degrees with some broken clouds. but we'll try to have them fixed before we arrive. Thank you, and remember, nobody loves you, or your money, more than Qantas Airlines".

+

"Your seat cushions can be used for flotation, and in the event of an

≁



Helis Teeth!



http://ww.augustoheli.com/ videos/videoarchive/ default.asp

THIS SITE WILL KEEP YOU DOWNLOADING. PLEANTY OF UNBELIVEABLE HELI ACTION.

Graeme Ousby

CADMAC SKITTLES EVENING May 8th 2003 - Starting at 8pm

Come and enjoy a fun evening out. As in previous years, participants will divide into teams and a meal can be purchased - tickets are priced at £5.50 per head and are available on club nights from Trevor or Bobby or by telephone 01243 780949. Last order date will be May 1st.

MENU

Steak & Ale Pie ~ Chicken Curry Ocean Pie ~ Vegetarian



Saturday 22nd March saw the first round of the newly inaugurated PicoJet Racing competition. On a bright sunny afternoon in a stiff northerly Ray Beadle, Adrian Childs and Andrew Gibbs, with borrowed PJ, lined up to do battle. Suffering from a nasty dose of the glitches, sadly Andrew had to withdraw despite lining everything barring the prop in cheese and chutney flavoured cooking foil to cut down interference. Down to a two horse race Adrian then executed a fiendish combat manouvre leaving the aerodynamics of Ray's PJ nose slightly better than that of a brick wall. (What a sportsman!) Needles to say 'Chopper' Childs then went on to record the fastest time of 1 minute 42 seconds for the ten laps in this first of three rounds.



Ray shows off the modified PJ nose with a very impressive Emu puppet impression. Am I mistaken or has his fore finger got a touch of APCitus?

lers! This sort of performance was available for most of the flight, not just at the beginning when the batteries were fresh.

It would be possible to increase the vertical performance still further by fitting lighter servos (saving 60g) and some of the new CP1700 cells (saving 140g) which would leave the model about 10% lighter.

After flight it was found that the higher power consumption had caused the cells to become too hot in spite of the cooling scoop. I added a second scoop and fitted "exit scoops" along with several holes underneath the cells. Cell temperatures on subsequent flights were then no more than warm.

Conclusion

I have now flown the model about 15 times, and each time the motor and controller have performed fault-lessly.

There is nothing difficult about using brushless motors and in my view they are very much suitable for the electric modeller who is willing to pay more for high performance. There are at least two other club members who are quite understandably very pleased with their Jeti motors. In fact you could even consider such motors as a sensible investment; with no brushes to wear



Another ARTF successfully converted to brushless electric flight is this lovely 48" s/o scale bipe belonging to club member Ron Jeeves. Powered by Jeti's 30-3 with a 40-3 s/c it weighs in around 5lb when fuelled with a 10 X 2400 mAh pack. Ron has yet to try it out with his new 10 X 3300 mAh pack.

standard servos, of which 908g was accounted for by the flight battery. This is around 20% heavier than the model would have been had I gone with an IC engine.

First testing

Once the motor was fitted I was of course curious to see how it went. This was accomplished in the back garden, something I would not normally attempt with an IC engine for reasons of noise.

It was first necessary to disable the built-in brake as I was not using a folding prop. A simple procedure for this is detailed in the instructions.

The throttle was then gently opened and the propeller began turning. My first impression was that the motor ran very smoothly, quietly and without any noticeable vibration. The motor pulled very strongly at full power. I did not measure this but by holding the model vertically upwards, it was obvious that the static thrust was close to the weight of the model.

I realised that prop-hanging was a distinct possibility so I changed the prop to an APC 11x5.5E in search of an even higher static thrust. With this prop, the motor gave 10,700 rpm, and drew 32 amps at a measured 17.2 volts for 550 watts total power input.

Initially I forgot to balance the prop and the difference in smoothness was quite noticeable, even though the prop was not far out of balance straight from the packet. Jeti's instructions quite correctly emphasise the importance of prop balancing.

First flight

The model was carefully checked over and photographed (just in case!!) before flving. Satisfied that all was well, I topped up the cells and prepared for take off. The throttle was advanced slowly and the model was airborne by the time half throttle was reached. The flight was really something of an anticlimax; the model was almost in trim and the power system worked faultlessly throughout the flight, which lasted a pleasing 9 minutes. No glitching was experienced. Prop hanging was not quite possible though extended vertical climbs were.

After the flight the power system was inspected – the motor was found to be warm (estimated 60c) and the controller barely above ambient temperature. The batteries were quite warm, though not hot.

Second flight

For this flight the prop was changed for an APC12x6E and ground tested. This showed a draw of 38A (the rated maximum) and a power consumption of 650W.

A cooling scoop was also added to the nose area.

Flying the model with this propeller showed a considerable improvement. To my delight enough thrust for prop hanging was now available (if only my skills were up to the job) incredible from a direct drive electric motor!! It was also fun to pull in to a vertical climb immediately after take off, thus astounding the IC model-

Climb and Glide 2003

This year's competition season started as usual with the climb and glide, however there was a change in that every pilot had to fly the same model which was the clubs trainer, the Junior 60 fitted with an old OS 2 four stroke which had to climb for 1 min and glide to touch down. No spot landing was used due to the wind direction and speed and the time taken included the 1 minute climb.

The weather was bright and sunny but with a sharp easterly breeze which got lighter later in the day.

There were 20 entries with people being added as the comp progressed, and there were concerns expressed as to the possibility of the model not lasting to the end of the comp.

So it was Adrian Childs who started the first flight and found that there was a big difference in the power of the Junior 60 against the model he is used to flying. This was the main comment of most of the senior flyers about 10 sec after they had taken off. There was probably less power than if it had been electric! Adrian put up a time of 1 min 53 secs which gave all the rest a target to aim at. John Riall went next and as he uses a Junior 60 to teach the newcomers to fly he was expected to do better, and he did, finishing with 2 min 57 sec. Well Adrian wasn't going to win this comp!! Tony Chant did a 2min 44 sec and Ray Beadle got to 2min 57 sec. Mick Blundell did 2 min 18 sec. I would like to thank Mick for his work during the comp as he started a difficult engine for most of the day !

Most people now were achieving 2

min plus and the times were consistent but Alan Litchfield managed to squeeze out a 3 min 12 sec by hovering into the wind, mind you the landing was rubbish Alan!

Then our Junior, Chris Kingston, came and produced 3 min 09 sec. He had never flown a model like this before. Still the average time for most pilots was about 2min 35 sec but Don Biles showed his aliding skills and did 3 min 07 sec. By now the wind had dropped a little which did not help the climb but some were trying to find any lift! Still the average time was about 2 min 33. Then 3 from the end Eric Peacock came to fly. He hasn't got his A Cert vet, so Mick stood by in case, as the rules allow, but Eric didn't need any help and found a lovely patch of lift. just landing on the runway for a time of 3 min 55 sec. Very well done Eric!

Results:-

lst	Eric Peacock	3 min 55 secs
2nd	Alan Litchfield	3 min 12 secs
Brd	Chris Kingston	3 min 09 secs

Thanks go to all that came and flew, and again a big thank you to Mick who spent most of his time fetching and starting the model so that everybody could enjoy the day!

The next comp is the take off and landings for which you can use any aircraft you like.

Cheers Ray

RED NOSE DAY

Well, not exactly, but reading through your February issue of Clear Dope vou will have seen our Comp Sec's idea of having a Gala Day at Porthole Farm on Bank Holiday Monday on the 26th of May. OK, but why entitle this article Red Nose Day? The answer is that Ray has asked me to organise a novelty event as part of the fun and suggested a Comp whereby all flyers dress their models up in some sort of outrageous decoration rather in the style of some of the Marathon runners or the Red Nose Dav participants. One may even think of the annual Pagham Pram Race for inspiration.

Being a Monday means that both power and electric models can be used, the only mandatory rule is that the model must be capable of flying a couple of circuits with full regalia (no manoeuvres will be required other than a safe landing of course). Anyway, I ask you to give it some thought, it's amazing the number of ideas that come to you when you put your mind to it. I shall probably be judging so the rules won't be too harsh, but I will have the camera at the ready so you could become famous!!

Alan Lítchfield

COMPETITION CALENDAR APRIL - MAY

Sat April 05	Pico Jet Practice and Race	12 noon @ Thorney Island			
Thurs April 10	Indoor Rubber	08 pm @ Club night			
Sun April 13	Take off/Landing	01pm @ Thorney Island			
Sat April 26	Pico Jet Practice and Race	12 noon @ Thorney Island			
Sat May 10	Electric Duration	12 noon @ Porthole Farm			
Sat May 17	Electric Duration	12 noon @ Porthole Farm			
Mon May 26	Gala Day	11 am @ Porthole Farm			
Register your entry - Contact Ray Beadle on 01243 670163					
All 2003 competition rules are printed in the February edition of Clear Dope.					

STOP PRESS

Ron Hemblade has a minibus available for May 3rd.

mium.

To decide where to put the equipment, I experimented with different arrangements, holding components in position using tape and elastic bands and checking the resulting CG position. I soon had a solution I was happy with.

Motor mounting

The firewall was cut to accommodate the motor so that half of it protruded through the firewall. This hole was made a little oversize to encourage a flow of air around the motor case and in to the fuselage.

I made a motor mount from 3mm birch ply (I was out of suitable plywood so a new IKEA magazine rack was prematurely "recycled" for this purpose!)

Controller

I decided to install the controller on the outside of the fuselage, partly due to space being tight but also because it would receive a good flow of cooling air and not be at risk

of being crushed by the cells in the event of a crash.

The thick wing of fun fly models ensures that they will never go very fast so I was not concerned about the slight increase in drag that this external mounting might cause.

Cells

These were to be installed where the fuel tank would have been, and are in 2 packs of 8 cells. The model's structure is designed to take an IC installation, and in view of the weight of the 16 cells (over 900g) I felt that it would be a good idea to strengthen the bottom of the fuselage with a little additional balsa, particularly the area around the undercarriage. I also added two thin strips of balsa to the floor to allow some air to pass between the bottom of the cells and the floor for cooling purposes. After these additions, the cells just fitted snugly in the remaining space.

RC gear

The rudder and elevator servos were installed in the pre-fitted servo tray, underneath which I positioned a 300mAh NiCad, wrapped in foam. To house the receiver and its protective foam, I made a small compartment behind the servos, accessible through a hatch on the underside of the fuselage. Placing the receiver at this extreme rearward position meant that I had to lengthen the lead to the controller slightly.

Propeller

For safety, I chose to use a high quality collet–fitting prop adapter in view of the high power of the motor. A carefully balanced APC 10 x 7E propeller was fitted. (The size recommended in the instructions)

Weight

13

The model came out at 2269g with 4

Phasor 30-3 length 52mm, weight 220g, for up to 10 cells, and 34 amps, = approx 340 watts, for models up to 2500g/88oz

Phasor 45-3 length 67mm, weight 303g, up to16 cells and 38 amps = approx 600 watts, for models up to 4500g/159oz. This seemed to be the motor for me.

I wondered why the motors were so named, and worked out what I think is the answer. It appears that the first part of the motor designation (ie the 15, 30 or 45) relates to the rotor length – the rotating part inside the motor can. (Notice that if 22 is added to the 15, 30 or 45 this equals the overall length eg Phasor 15-4: 15+22 = 37)

The second part of the designation refers to the number of winds: either 3 or 4 in the case of these motors. Thus we arrive at designations such as 15-4 or 30-3.

First impressions - Motor

The motor has a high quality feel to it, feeling very smooth when the substantial 5mm shaft is turned. It seemed slightly strange to find no cooling holes in such a powerful motor, but this is of course a measure of its efficiency - with no

brushes, comparatively little heat is generated inside the motor so no cooling holes are required. An additional advantage of this is that the motor will stay clean inside. From the rear of the motor 3 wires protrude, each fitted with a high quality 3.5mm connector.

First impressions - Controller

The Jet brushless controllers look much like normal controllers except that 3 wires are provided for connection to the motor. Each of these is fitted with a connector to match those of the motor.

The controller I used was the Jes 40 -3P opto. This is a non-BEC unit. The "opto" part of the designation indicates that the controller's power circuits are optically isolated from the RC system connection. This means that any interference that the controller may generate internally is not passed along the connecting wire to the receiver.

Instructions

The instructions did not detail how to wire controller to motor and the solution was not obvious to me so I contacted Irvine. It turned out that it is not at all critical; you just connect any wire from the controller to any wire on the motor. If the motor runs backwards then any two pairs of wires are simply swapped around.

Planning The Installation

The space within the fuselage was naturally enough designed to accommodate a normal IC installation. However, in this case 16 Sanyo 1700SCR cells were to replace a 6oz fuel tank so space was at a pre-

Club Gala Day

Bank Holiday Monday. (May 26th) At Porthole Farm.

Trade Stand (Chris Collins)	Wine Fayre	Barbecue (Tony Chant)
Electric Gliders APLD	572819	Ron Hemblade
Control Line	670791	Mick Blundell
Balloon Burst	670163	Ray Beadle
Electric Free Flight)	373041	Peter Sackman
Electric R/C	839737	Andy Gibbs
Park Flying	868163	Peter Daer
Scale Flight	782922	John Riall
Fun Flying	530407	Mick Pearse & Chris
Dress Up Your Model	263236	Alan Litchfield
Fly the Longest Banner	670163	Ray Beadle
Pico Jet Racing	605279	Richard Farren
PLUS - Chuck Glider	*	PLUS - Rubber

A GREAT FUN DAY FOR FLYERS FAMILY & FRIENDS

- ***** Enter any or all the events contact the person named along side.
- ***** Control line will run from the patch and will be held on its own.
- * The timing for the other events is open.
- ★ Offers of help for short spells during the day will be very welcome. Contact event organiser: Ray Beadle on 01243 670163

GET YOU MUG IN THE MAG!

An Electric Fun Fly using a Jeti brushless system

by Andrew Gibbs

Some months ago I purchased an ARTF Cougar fun-fly model to replace my scruffy and ageing (10 years plus!) .40 powered Wot-4. Eventually this model quite unexpectedly suffered catastrophic wing failure at Porthole. The model had actually needed and which motor should I choose? I did not want my fun fly to be underpowered and so become a "misery fly"!!

A useful rule of thumb in electric flight is that 100 watts per pound of model will result in a lively model. I calculated that the model would weigh approximately 5 pounds so this meant at least 500 watts of power would be required (about two

enjoyed a long life, having been rebuilt twice. When the time came to assemble the Cougar, my thoughts turned to electric power and I began to look around for a suitable motor.

I wanted the model to be of comparable performance to a sport IC model. This clearly indicated the need for a relatively powerful electric motor, but how much power was -thirds of a horsepower). This is approaching the same power that a .40 glow engine could deliver, which seemed about right as the quoted engine range for the model was .25 - .40.

A bit of background information: NiCd batteries, as we all know, are rated at 1.2 volts per cell. This is in fact a nominal voltage, and it will vary depending on circumstances. For example, when under load, the voltage will drop, and, the larger the current, the greater this drop will be.

In our airborne R/C systems, the voltage drop is more or less negligible as currents are low, averaging perhaps only ¼ amp, but when considering an electric flight power system, we may easily be talking of continuous currents 100 times higher, for example 25 amps.

The voltage drop at this sort of current is most definitely not negligible, and the battery voltage may fall to about 1 volt per cell. This was the value I used when working out how to achieve the required 500 watts, which is described next.

I first considered the need for 500W from the point of view of the cells. If I used 8 cells, it would be necessary to draw 62 amps to achieve 500 watts (62 amps x 8 volts = 496 watts) This is asking a bit too much from the so called "sub C" cells, the size we normally use in flight packs as they would get very hot if made to deliver this kind of current continuously and would only give a very short duration.

However, if the cell count was doubled then the current could be halved and still get 500W. For example, using 16 cells (say 16 volts on load), 500 watts would be achievable on 31 amps ($31 \times 16 = 496$). This is a much more acceptable current for the cells to provide continuously and would ensure a reasonable duration, at least 3 min-

utes at full power.

That was the battery part of the problem dealt with. Now it was time to source a motor. After these simple sums I knew I was probably looking for a motor that could be run on something like 16 cells and 32 amps. The obvious solution was to use a brushless motor. The Jeti Phasor range of brushless motors came to my attention. They are distributed by Irvine, and thus widely available in the UK.

Overview of the Jeti Brushless range

The Jeti Phasor range comprises 4 brushless and sensorless motors, all of which are 36mm in diameter and with a 5mm diameter shaft. They are designed for use in direct drive applications, with or without folding propellers. I investigated the range at Sussex Model Centre (01903 207 525) and discovered the following information:

Phasor 15-3 length (excluding shaft) 37mm, weight 136g, for 6-7 cells, up to 26 amps = approx 180 watts, for models up to 1300g/45oz. This motor is intended as a replacement for a direct drive Speed 600, in powered gliders and sport models, using a 7x4 or 8x4 prop.

Phasor 15-4 length 37mm, weight 136g, for 7-8 cells, up to 29 amps = approx 230 watts, for models up to 1600g/56oz. This motor would be a replacement for a more powerful Speed 600, using an 8.5 x 5.