that guys like Tom Davis and a few others are achieving spectacular results because of this prop and gearing flexibility. If the promise of these small planes holds true then we can all look forward to many inexpensive model such as B-17's and DC3's that will fly just fine.

Learning to scratch build props and gearing around the small motors is a small price to pay, and for tightwads, like me, a fraction of the cost of conventional electrics. Props and gearing in this power range are not subject to stress as are the more powerful 05 motors. This allows home brew props of the rubber band type.

Keith Shaw let the secret out in Shaw Speaks when he stated that finding the correct prop is all important, and much experimentation is needed.

Conventional electrics and wet power are stuck with what is on the shelf. Wee Watters can home brew props ad infinitum. Who is to say that a 7 to 1 gearing and a 6.5 by 7 pitch will not resonate perfectly with one particular plane and power package?

Finally, scratch gearing with a 48 inch pitch gear has proven to tame these small high RPM motors quite well. If you have been paying close attention to the War Power Motors bunch, (i.e. Model Electronics Corp. Ed.), up in Seattle you will understand that taming a high RPM motor is the secret to their astounding performance with 05 and larger ceramic magnet motors.

I hope this encourages some modelers to go back and bone up on old stick and tissue building skills, and get into this Wee Watt category, which for me, ranges between 25 and 50 watts. [I agree. Hopefully, Bob, and other Wee Watters will come to Dallas on September 30 for our Fly-In where they'll be able to shoot for Lightest RC Electric to Fly 10 Minutes, and so persuade more of us to buy in to the Wee Watt persuasion.]

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ELECTRIC WONDER

Gary Warner

(Also from the DEAF newsletter)

Sig put out a little flying wing plane called the Wonder about a year ago and ever since I saw it, I knew it would make a good "E" conversion. The first thing I did was to run out and buy the first kit to arrive at Wild Bill's Hobby Shop.

After getting home and looking carefully at the kit, it became obvious that it was going to require some modification for an electric motor, so much so that I shelved the kit in the hopes of putting a 15 size glow engine in it. The biggest problem I had with the design was the low, 338sq inches of wing area.

The kit was surprisingly heavy, and this would mean an estimated weight of 40-42oz if built stock. Maybe it would have flown at this weight, but I wasn't willing to take that chance what with a large investment of building time.

Moving on, (about 6 months later), my desire for a hot little "sportster" plane was increasing again. This came about because of our club scheduling an exhibition outing to a gas" field in order to show those guys just what electric powered planes can do.

Well, the Wonder was the first thing to come to mind. I once again took the plans out and looked them over carefully trying to find the best way of lightening the air frame. I also moved away from the cheaper and heavier motors to the lighter Astro 035. Finally I was convinced that the weight was going to be acceptable, around 32oz.

The biggest weight saving was to come from changing, replacing, and/or omitting wood in the kit. When it was all said and done, the only wood I used from the kit was the ribs, spars, trailing edge sheeting and two small plywood formers. All the other wood was replaced with thinner and lighter selections.

Another big weight savings came from not sheeting the top and bottom of the leading edges. The kit didn't call for any shear webbing, so I didn't see the need for "D" tube construction. Instead I added shear webbing for "0" strength and hoped the wing wouldn't flutter at high speed. The covering is Mica-Film, and the aileron control system was replaced with a flex cable system. The air frame weighs only 7oz - 7 to 10 oz less than the original kit. I was pleased.

As I said, the power is an Astro 035. I made my own motor mounts from aluminum and rubber banded the motor to the mount. This turned out to save a lot of weight. The fuselage was left mostly open under the wing and thus I could use most any size battery I had. Placing the aileron servo on its side in the wing such that nothing was sticking out into the fuselage helped in the battery compartment. The motor control is a Simprop 95 with a soft start. This really is only an on/off controller, but I chose it over a micro switch so that I could take advantage of the BEC function.

As everything was assembled and the first flights were near, I placed the plane, ready to fly, with a 7 cell SCRC 1700mAh pack on the scale. Total weight 31oz! I turned on the motor and checked amps and RPM. The prop used is a Graupner Super 6x6. Static RPM is about 15,100, and static amps about 35. A little playing around with these numbers and I knew I had a keeper.

The first available day for test flying was less than perfect. A lesser man, (maybe that should read "smarter man"), would have waited for better weather. The clouds were out in full, the temperature was in the 60's and the winds were 25 and gusting to 35. When bolting the wing on, I had to kneel behind the car so as to avoid having the wing blow into the next county. Anyway, the time had come. I hit the throttle, and up she went. I mean up, and up with a passion. After 5 seconds I grabbed all the down I could get and finally stopped the climb at about 500 feet. There was no question that this was going to have climbing power, but how about the maneuverability?

A little left stick rewarded me with the snappiest little full roll I had ever done with any plane. At this time I thought it might be a good idea to find the dual-rate switch. After having set the switch to give a roll rate less than 5 rolls per second, turns were much better.

One of my primary concerns with this design was the slow speed performance since the wings were so small. I shut the motor down and before I knew it, I was flying backwards at about 15MPH. I couldn't tell if the plane was really flying slow, or if it was just the wind making it look slow. At any rate, my fears of excessive landing speeds would not be a problem today. I came on in for a landing after only 1 1/2 minutes in the air.

The ailerons were quite effective all the way down to the slowest landing speeds.

Subsequent flights have been made with 1000mAh battery packs and the performance is very similar to the 1700mAh packs except for a noticeably slower landing speed. I haven't tried any other props on the plane and with good reason. First, the plane's flight with a 1700ma pack is 3-1/2 minutes of pure thrilling performance, and secondly the plane likes the speed afforded by the 6 inch pitch. It can do most anything the gas version of this plane can do, and in my opinion it does it better.

The plane has now flown a number of times at the gas fields and the response is always the same: "I can't believe that that's an electric!". At one field, I launched fairly far away from a large group of pilots. I guess they didn't see me launch it because one of them came out to the runway while I was flying to ask me if the plane was powered by an OS 15. He said that the guys were wondering since only the OS or an electric was that quiet. When I told him that the plane was electric he

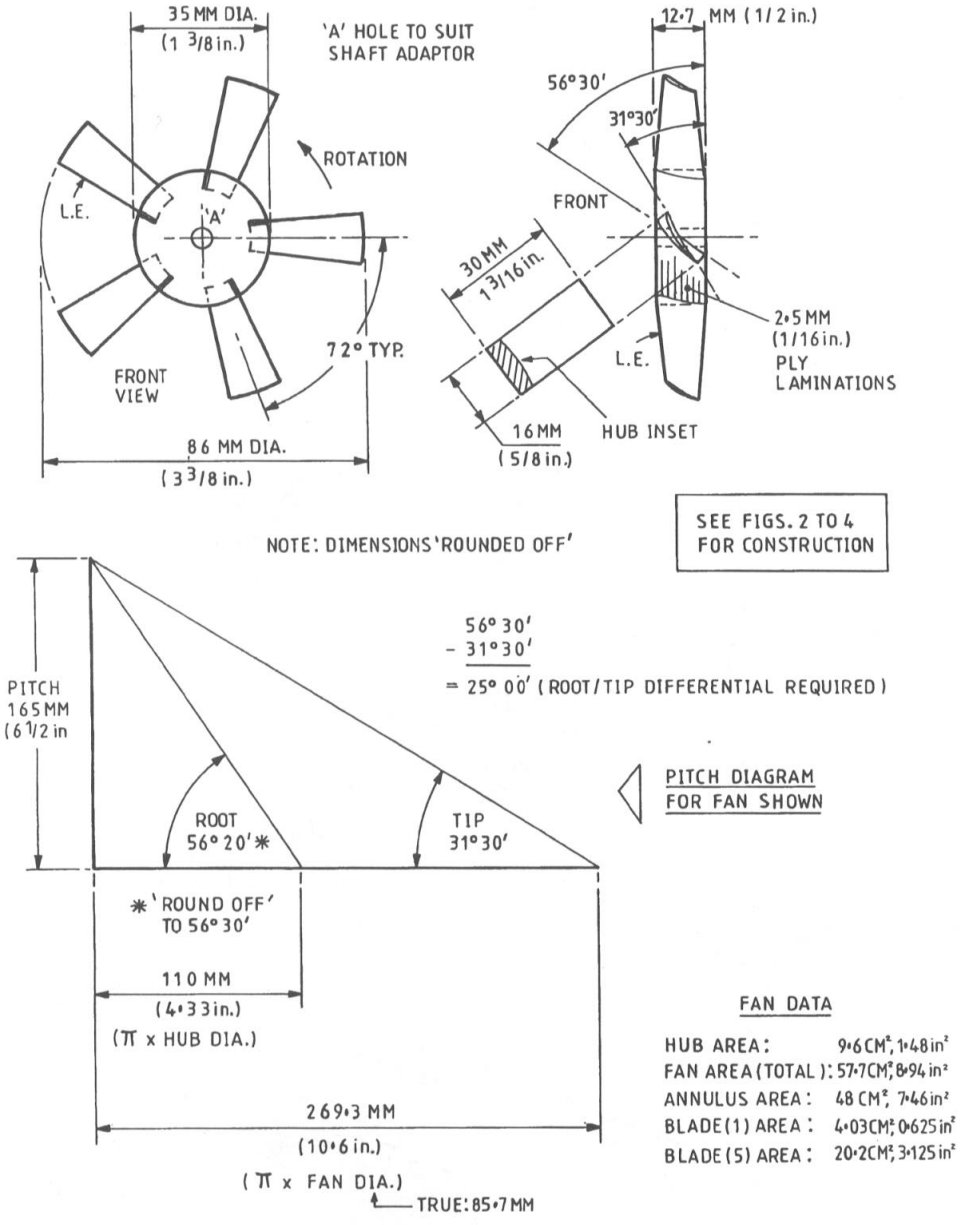

FIG. 1 : FAN DIMENSIONS/DATA

I.H.B. APRIL '95

looked up in the sky as I flew by and said, "Wow! That sure is fast for and electric!"

As I think you can see, the plane filled the need to demonstrate electrics as capable, strong flying and practical R/C planes. God I love electrics! If you have any questions contact me at 333 Prestonwood, #605, Dallas, TX., 75081. Ph: (214) 235-1124.

DUCTED FAN IMPELLOR FOR 'HOT' 540 MOTORS

By Ian Brown

from: Autumn 1995 Electric Flight U.K, editor Gordon Tarling, 87 Cowley Mill Road, Uxbridge, Middx. UB8 2QD, Great Britain

Aircraft modellers are great experimenters and although there are several very good fan units in production, there is always a place for the homemade fan.

This fan is suitable for a mid-fuselage installation, or as a podded unit. With a 'hot' 540 motor, it will produce in the region of 20 ounces of static thrust-plus. A model of around 350 sq.in. should have the right wing loading for a good performance. Obviously, weight should be kept down, and performance will depend on the prototype chosen, intake/exit areas, and how 'draggy' the airframe is.

The big problem with malking a fan has always been the blades. Ply or fibre blades are difficult to form, and reluctant to maintain their shape. Plastic blades, when cambered and twisted, tend to develop an irritating flat at the mid-blade position.

The method shown in the following diagrams will provide both camber and helical twist, while ensuring that all blades will match perfectly.

When assembling the fan, it is best to do this on a flat, non-stick surface, so that the blades will 'track' correctly.

The same 'Polypipel' plastic plumbing tube can be used to make the motor mounting stators. When experimenting with various fans, it is best to use a static 'spinner' fairing in front of the fan, supported on narrow stators or even three wire supports. This will prevent the balancing problems associated with attaching a large spinner to the fan hub.

The fan shown is just one of various permutations possible using plastic pipe for the blades. For example, a larger diameter pipe will give less camber, and a variation to the diagonal cut, less twist, etc.

The principal is certainly not new - aeromodellers

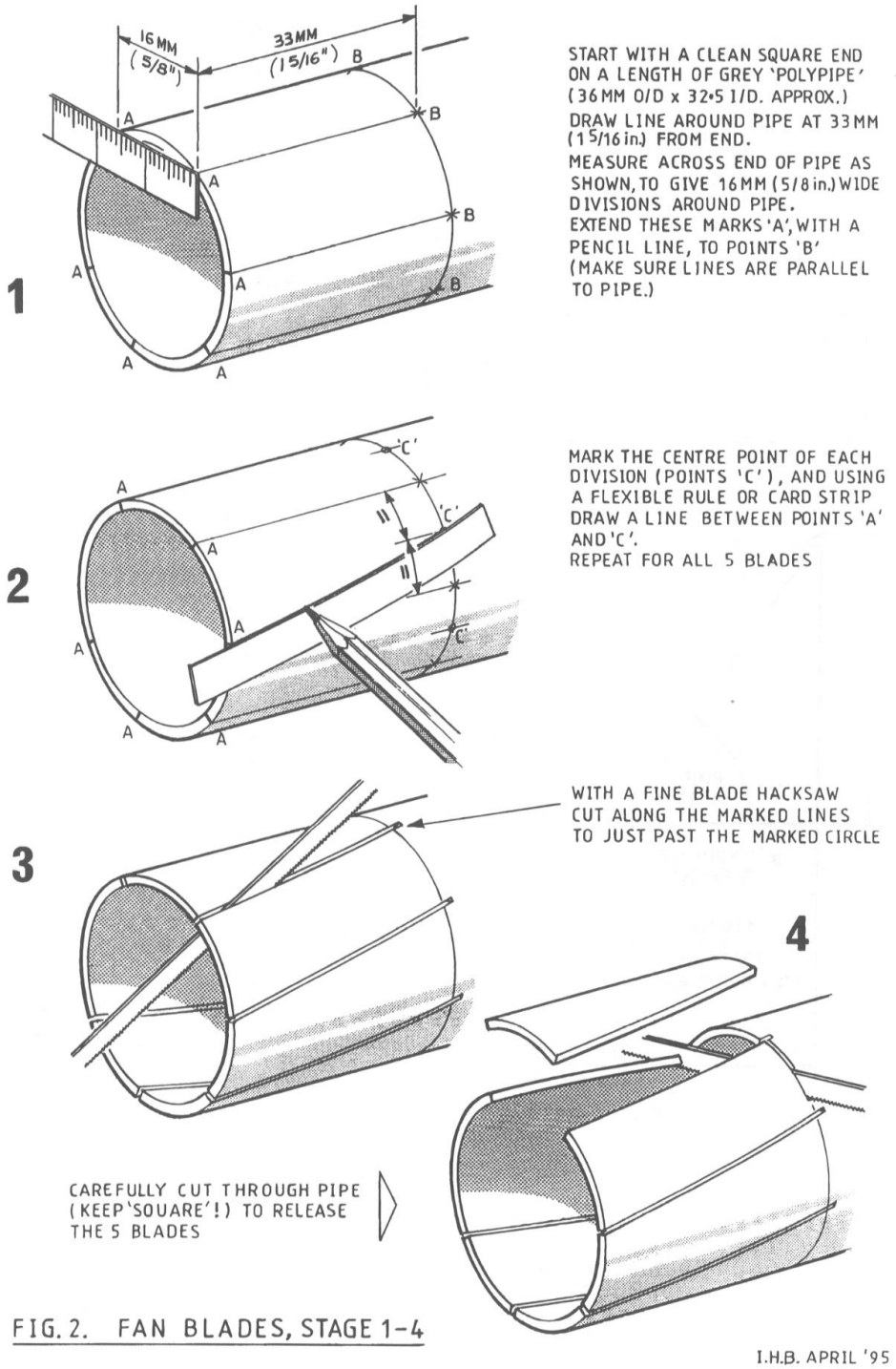

FIG. 2. FAN BLADES, STAGE 1-4