*This material is the original, unedited version of a feature article reviewing the Dumas DH 89A Dragon Rapide (Kit No.1815) that was published in Flying Models Magazine.*

***Background info you'll really want to know about...***

If, like me, you have a thing for airplanes of the 1920's-1930's *Golden Age*, this model is one you will not be able to ignore. A lot of the American designs we remember from this period took on a stocky, pugnacious appearance owing to the *big muscle* radial engines so many of their designers wanted to use. On the other hand, the British aeroplanes of those days with their long narrow inline engines had a sort of lean, exotic aura about them. The DeHavilland DH 89A Dragon Rapide airliner is as about as good a representative of *that look* as you are likely to find. If it grabs your attention you'll have no trouble forgetting to worry about those long, tapered *biplane* wings, the elaborate *twin* engine nacelles and cowlings, and all the flowing curves that help explain why there have never been many Dragon Rapide kits on the market.

Enter Pat Tritle, master designer of exquisitely *flyable* lightweight electric powered RC scale airplanes. Pat has a talent for capturing the essence of an airplane without being drawn into replication of intricacy that too often manages to morph itself into extra weight. I could present a considerable list of dimensions and details that will never match a scale drawing of the full size DH 89 A, but I'll bet that very few of you who will want to build this kit could find them without help. That stuff doesn't matter here...it's about

the *flying,* and the *fun*.

Speaking of fun, with a model like this one it's as much about the *building* as it is about those warm sunny days at the flying field. As those of you who already have experience with stick-and-tissue construction already know, that part starts the first time you open the box, smell all the fresh, clean balsa and covering tissue, and look for a place to unroll the plans (there are *three* big sheets of them in this kit) to see what challenges are waiting there for you. It's a subtle, special treat...something you will *never* experience with an ARF model...but you have to earn the ability to appreciate it. This kit is *not* the one to choose for your first attempt at traditional model building. There is just too much going on and too much depends on experience and skill on your part. Yeah, way back when guys like me had hair that wasn't gray...or gone...we all learned about model airplanes by cutting parts, building up structures over the plans, then sanding, covering, doping and sanding some more. It was the hard way or no way if you wanted to become an accomplished builder of *flying* models. More and more of today's modelers are learning that those old time skills are worth working for. That's part of the reason new product lines like the Dumas kits are getting so much attention. I have discussed this issue with the folks at Dumas ...please check out the sidebar for their suggestions on a better kit to begin learning with.

Speaking of cutting parts...we built most of the old time models from what are called *printwood* kits, in which all the pattern-dependent parts like wing ribs and fuselage formers were *printed* onto sheets of balsa of the requisite thickness. We cut them out, one

at a time, by hand. You were supposed to use the good ol' pointy No. 11 X-Acto blade, but none of the kids I knew ever had enough money left over from buying a kit to afford them. We used Dad's old razor blades and learned a lot about nursing cut fingers while we practiced gluing broken pieces back together. Nobody I know today, myself included, can cut balsa parts as accurately as a laser cutter, and the laser work every Dumas kit I have seen is really good. You still need all the old skills to fit and glue and sand all those parts into an accurate model airplane structure. Once in a while I have been known to build an old printwood kit just for the nostalgia, but I still don't like fixing razor-split parts.

***Building the airplane...***

Dumas presents a well written fourteen page instruction manual. In order to evaluate this kit properly I followed the recommended construction sequence faithfully, and so should you. Pat Tritle wrote it, and he took the time to get it right. As it turns out, the first construction steps don't involve those laser-cut parts at all. Pat employs the proven *laminated bow* technique to build the tail surface outlines and suggests that you start work on your Dragon Rapide by building those so they'll be dry and ready to work with when you need them. Do it just the way he says...it works.

The wing panels come next...all *four* of them...and they are as *traditional* as you are likely to see. There are *lots* of ribs, and no two pairs are exactly alike. Pay attention. If a rib doesn't fit the plan exactly, you've got the wrong one. Both wings are built by

assembling all those ribs to 1/16" sheet balsa spars built up from laser cut segments. You add conventional balsa strip leading and trailing edges, the extra parts that define the ailerons, and several laser-cut engine nacelle/landing gear mount formers and doublers. There are no balsa sheeted exterior surfaces *except* the nacelle bases on the lower wing. This design does not need them, but it *does* demand careful attention to *sanding* to get all those subtle curves and contours just right. I made one change to Pat's wing structure. As designed, each of the ribs butt-joints against the front surface of the tailing edge. If assembled accurately, this structure is strong enough to resist the shrinking loads imposed by lightweight plastic film covering. However, I planned right from the start to use a traditional dope-and-tissue covering. Even with careful use of non-tautening dope, it is almost impossible to keep the tail ends of the ribs from compressing into the trailing edge under the tension of the covering and causing bumps and puckers that will never go away. I dealt with this by adding little triangular gussets of 1/32" sheet balsa to *every* rib-to-trailing edge joint (see photos). This does add measurable weight, but ( in my opinion) whatever miniscule effect that has on real world flight performance is far outweighed by the appearance of a stable, undistorted structure under the tissue. Changes like this will always be a judgment call for experienced model builders...you have to decide what is most important to you.

The main landing gear (should we say "undercarriage" for a British *aeroplane*?) assemblies are built up from .062" and .041" steel wire provided in the kit, bent to shape over the plan and then wrapped with fine wire and soldered together. This is the sort of job that frightened me as a kid with nothing but a worn out pair of pliers and a

humungous soldering iron borrowed from a neighbor. It's no big deal with the proper tools, but take the time to get it right. Be sure you understand what is supposed to happen before you start bending and cutting wire. Because there are several different diameters of wire in the kit, I suggest that you use a micrometer to be sure you are working with the right one.

The fuselage is built up from two *very traditional* side frames joined by a couple of shaped formers and a lot of balsa stick crossmembers. Follow the directions step by step, join the sides *over the plan*, and get it right. There is probably a lot less balsa sheet in this fuselage than you are used to seeing. That's not a problem...all power is transmitted to the airframe structure through the twin engine and landing gear mount assemblies and the lower wing, and through stout 1/8" balsa sheet base plates into the fuselage. Structurally, the rest of the fuselage is there only to hold the various flying surfaces in position relative to each other. There is no good reason to reinforce the nose.

At this point the instructions call for you to build up the tail surfaces using the previously laminated outlines. There are no surprises here, nor should there be any in the next step...installing the servos and control linkages...if you follow the instructions step-by-step. You may have noticed that Pat Tritle's structural design does not provide for nuts-and-screws disassembly for maintenance. There are parts of this model that you may have to *cut* to get at some time in the future. All those little mounting tabs and doublers and hardware bits would add weight. I compromised and added reinforcing flanges of

3/32” square balsa where the upper and lower nacelle moldings attach to the wing, then spot glued the plastic parts *to the flanges* instead of the wing surface.

I *did* indulge myself in a couple of other changes in the fuselage for the sake of scale appearance. Rather than attach the molded plastic nosecone and cockpit enclosure *after* covering and risk having them *look* like glued-on pieces, I masked off the window areas that were to remain clear and glued both moldings in place, then added short in-fill pieces of 1/16” square balsa to the various stringers wherever necessary. That permits sanding all the joints flush so the covering can overlap the joint and lie fair with the underlying plastic. I cut out the round landing light molded into the nose cone fairing and inserted a foil-backed clear plastic “jewel” from the craft store. I also found a piece of *really light* 3/16” balsa sheet and shaped it to form a vertical fin fairing that adds strength and much improved scale appearance to the tail assembly at the expense of a very small increase in weight. You may also notice a narrow raised strip down each side of the fuselage...these are 1/32” diameter carbon fiber rod glued in place over the covering tissue to represent covering seam reinforcements on the full scale Rapide.

Everything I have read about this kit emphasizes the suggestion that you make an extra effort to fit the plastic nacelle and cowl parts accurately. This bears repeating. Do not assume that by cutting the parts out of the matrix *on the lines* you will get them to fit well. Knowing that there will always be variations from one stick-and-tissue model to the next, Pat designed those parts oversized to permit you to trim and sand and adjust until they fit just right.

The engine cowls/forward nacelles are intended to be semi-permanently mounted by spot gluing. This means that the motors and gearboxes must be mounted and checked out before you complete the assemblies. Since I had already made the decision to put some extra effort into my Dragon Rapide for the sake of scale appearance, it made sense to choose brushless motors for a step up in quality and durability over the stock set-up. I used a pair of Feigao 1208436 4.1 Kv motors installed in BP Hobbies metal gearbox/motor mounts with the 3.5:1 (S-2) ratio, along with two Feigao 6-Amp Brushless Speed Controllers (FG-BLESC-6A) and a pair of GWS 7-6 props as called out on the plans. All of these goodies came from BP Hobbies. With that stuff safely inside the molded cowls and checked out, I added a bit more detail in the form of simulated access panel hinges made from 1/16" aluminum tubing and scored with a jeweler's saw to represent piano hinges, along with exhaust stacks carved out of some scraps of basswood that were just a bit fatter and more durable than the 1/8" balsa blanks provided.

Alignment of the Dumas Dragon Rapide is not something you want to guess about. I followed the instructions step by step, but instead of trying to work with an ordinary incidence meter on such a small airplane I made a custom jig from scrap balsa strips...check out the photos for a look at this. I used the laser cut *outer interplane* struts as per instructions, since they are designed to lock the wing panels into correct incidence relative to one another, but I substituted lengths of 3/16" streamlined aluminum tubing for the balsa nacelle and lower cowl struts as well as the inboard interplanes in the interest of improved appearance. I also followed the instructions in adding the flying wires, but I substituted *beading wire* (I used .015" Beadalon™ nylon coated stainless

steel wire from the craft store) for the thread provided in the kit as I have had unhappy experience with thread rigging developing severe *fuzzies* and sagging over time.

Pat suggests that using one of the popular lightweight film coverings might be the most nearly foolproof method of covering and finishing the Dragon Rapide, but he also acknowledges that this model is a fine place to keep the traditional *old time* dope-and-tissue techniques alive and well. That's the way I do *all* of my small models these days, but I can't explain it all to you here...that wouldn't leave much space in this issue for anything else. Suffice to say that I used the gray tissue provided in the kit to double-cover *over* 000 white silkspan, sealed with non-tautening clear nitrate dope and given a light airbrushed aluminum finish using the same Stits Polytone aircraft paint that serves as the color coats on everything I build. The markings came from Callie Graphics and replicate the appearance of a full scale DH 89A that was restored as an RAF Dominie and featured as the subject of several photo studies online.

***Flying the Dragon Rapide (the good part)...***

Everything Pat Tritle says about flying this model is true. I built mine with the intention of adding more of the *good scale detail stuff* than Pat included in his prototype, with the result that my airplane is a couple of ounces heavier than his, but this does nothing to change the character of the airplane. A full scale DH 89A was intended to do one thing well...to fly along from here to there, carrying people, sedately. Would it do loops, rolls and wingovers? Probably, but I suspect that there have never been many pilots who

wanted to know what that might feel like, first-hand. This model is the same...it's a slow motion time machine and I don't have any interest in finding out how tight a loop it might make.

Pre-flight checkout for this Dragon Rapide is  just about what you'd expect for any lightweight e-powered scale job. Don't tolerate warps or mis-alignments in the structure...anything you can *see* without measuring devices is enough to cause trouble. Likewise, a delicate model like this one is not the place to assume that binding, sticking, or otherwise sloppy control surface motions will sort themselves out in flight. Depending on the motor-ESC-battery hardware you choose, the procedure for synchronizing will vary, but get it right. In my experience, having one motor on a model like this one come up to speed before the other , as you have seriously asymmetric thrust before there is enough airflow over the rudder to permit you to do anything about it except swerve wildly off the strip. *Balance* is critical. The location Dumas shows on the plans works fine for a super lightweight model, but Pat suggested to me that any significant gain over design weight means you need to move that point *ahead* on the order of ¼". (More nose-heavy.) He admitted to me that there is no callout of a target weight anywhere on the Dumas plans or in the instructions. His prototype flies at *13 ounces*. I won't even try to match that. You could say that Pat Tritle designs and builds with *magic*, or just admit that he is really good at eliminating *everything* that can be left out without having the airplane fall apart. I can't do that. My review model was built from the outset to see how much *feel-good* detail I could add without compromising the slow and graceful flight performance that's the real reason I wanted to build it in the first place. I came in at 20

ounces...heavy enough that moving the balance point ahead as noted was necessary, but not enough to keep my Dragon Rapide from making clean takeoffs from grass in ten feet or less and cruising like an indoor job when the air is smooth enough for that sort of thing. As we all know, *just right* conditions at the flying field don't come along every day. Is it worth waiting for times like that to get in a few flights on the Dumas Dragon Rapide? You better believe it is!

Photo captions:

1 I used 1/4" thick double-faced foam board to make the tail surface lamination forms, and built up the parts exactly per the instructions.

2 There are FOUR wing panels. All are different, all are classic built-up balsa structures, and all demand that you follow instructions and add lots of patience.

3 A close-up of the left lower wing inboard section illustrates the trailing edge gussets I



added to prevent post-covering wrinkles.

4 Here are the landing gear strut assemblies bent to shape, wire-wound, and soldered.

5 This is the primary fuselage structure.

6 The rudder and elevator servos are mounted to simple balsa rails inside the fuselage. I added an oversized output arm (made from scrap epoxy glass board) to one to the Airtronics 94091 servos to match the rudder horn for an accurate pull-pull connection. The rail material provided was too soft...I suggest replacing it with spruce or *really hard* balsa.

7 This is the right aileron servo in place, viewed from the bottom. You can see the complete main gear assembly in place on the landing gear mount plate at the top.

8 Here is the same aileron servo seen from the top. It would also be possible to mount the aileron servos upright, oriented fore-and-aft, with the lower portion of the case extending into the molded lower landing gear fairing.

9 A close-up view of the nose cone and cockpit enclosure. The tape on the nose fairing



is a temporary alignment aid. The tape on the window areas is masking and will be removed after the final finish is airbrushed.

10 These are the Feigao 1208436 motor and S-2 ratio gearbox assemblies before

soldering the bullet connectors in place.

11 The right lower wing has been covered with 00 silkspan and given a single coat of non-tautening nitrate clear dope. The inboard section has been double-covered using the gray tissue provided in the kit...the entire structure will be finished this way.

12 Here is the inboard end of the lower left wing, all covered, with the aileron and ESC protruding from the root rib, ready for joining with the fuselage.

13 Some extra 3/32" sq. balsa on the bottom of the lower right wing makes an improved mounting for the lower nacelle molding.

14 Here are both lower wings with the motors in place and the nacelle assemblies completely assembled.

15 The BP 12 mm metal gearboxes fit the stick-type mounts as provided in the kit.

16 the lower right wing assembled to the fuselage with the recommended GWS 7-6 is in place. The masking tape holds the cowl in alignment for spot-gluing in place.

17 This is the lightweight balsa tail fairing added for better scale appearance and a bit of reinforcement.

18 Here you can see the fuselage and lower wing center section on the alignment jig. Everything is held in place with rubber bands during assembly.

19 With the fuselage squared up to the work surface, the outboard portions of the jig ensure the proper wing panel separation along with the correct incidence angles.

20 & 21 Up close you can see the intentionally chalked and weathered aluminum finish achieved by using a light spray of Stits PolyTone Clear with matte additive that was carefully rubbed down with a Scotchbrite™ pad after drying.

22 – 25 Clear blue skies and a classic beauty of an aeroplane...what more could you want?