

"Senator", Vintage Lightweight Duration Model by Albert Hatfull, circa 1950.

I have built four Senators since the early 1980's and they have had progressively improved performances. The reasons for that are probably due, over time, to their decreasing all up weight as well as my improving ability with this class of model, particularly in trimming them to take increasing levels of initial motor power/torque.

The first three models were all lost in competition and not all to fly-aways, the last one nearly drowned in the River Isis at Oxford before being rescued by a canoeist and immediately stolen from the riverbank by a passer-by. Even with a radio tracker on board I could not trace the model, although rumor has it, that it finished up in an Oxford Pub and resides there still. Anyway, the current version was built some five years ago and features in most of the images here-in.

What follows is my personal interpretation of its subsequent development as a competition model since it was designed. In many ways, today's "Senator" has a flying performance that exceeds, by a considerable margin, that which was perceived and/or achieved by the designer and his contemporary builder/flyers. Bear in mind that it first appeared in kit form and from those early days, apart from a knowledgeable few, it was not widely used as a serious competitive animal.



Indeed for the best part of 35 years it was used mainly as a medium performing sport model, most people building it directly from a KK kit containing heavy (crappy) wood, a saw-cut blank, or later, an inefficient plastic propeller. Such rubber that may have been supplied (or available) would probably not have been the more desirable "Pirelli, but something inferior. Thus most sport flyers would have been pretty happy with sub two minute flights in unhelpful conditions and when models were lost it was probably due more to terrain/crops than to performance. So what changed?



Well, during the early 1980's, SAM35's legendary Mike Kemp of "Rubber Column" fame created a new class of rubber powered competitions known simply as "Vintage Lightweight Rubber". Indeed at the most popular and well attended early venues, Cockleborough Farm, in the English

Cotswolds, and RAF Odiham, the class became very fashionable. Basically models had to be less than 32" wingspan and designed prior to 1951. That's it! Even then there was a perceived disadvantage thought to exist for models with freewheeling propellers against those with folding propellers, so Mike split the class into two categories for folders and freewheelers. And that's how it was for several years.

Obviously the Senator was quite popular because the kits were still freely available and therefore, so were many copies of the plan. Practically everybody had one! The participating Samlanders started to build the "Senator" using just the plan and pre-selecting their own wood and supplies as well as carving more efficient propellers to

make all round improvements to performance. Apart from the inherent stability engendered in the design by its generous tip-dihedral and significantly forward wing position giving a relatively longer moment arm, the two most significant assets were its anti-stall nature encouraged by that freewheeling propeller and of course the fabulously turbulating multi-spar wing. Thus, the "Senator" started to win its freewheeling class with metronomic regularity and was often (embarrassingly) outperforming models in the folding propeller category too. Mike Kemp and his son, Martyn, became expert exponents of the "Senator" revolution.

The popularity of this new SAM35 class did not go un-noticed by the SMAE (now BMFA) who eventually introduced a similar class known as "Mini-Vintage" (to include Power and Glider models). In the meantime, several very experienced competition minded modelers entered the fray with replicas of some very potent rubber models, mostly with folding props, but as I recall, the first to really capitalize on the latent potential of the "Senator" were the ubiquitous Dave Hipperson and Ian Davitt, who both built versions under 60 grams, plus 30 grams of rubber driving extremely efficient propellers. They went on to prove the model against keen competition and Dave soon published his findings for all to see in "Aeromodeller" magazine. Thus the seriously competitive popularity of the "Senator" was established and has remained in the vanguard of the Vintage Lightweight (Mini-Vintage) scene ever since. Indeed, it would not be far wrong to say, again, that nearly everybody has got one (free-flight competition/sport modelers – of course).

Its competitiveness is further illustrated by Ian Davitt, a seasoned contest modeler, flies a "Senator" in Open Vintage as well as modern Open Rubber competitions where the max is usually set at 2 ½ minutes and then uses the same model in fly-off's, for which he rarely fails to qualify. To put this into context, in the latter class, specialist fly-off models can often exceed 500 square inches of wing area and sport motor runs in excess of 2 ½ minutes with unassisted flight times of more than 8 minutes. For a small 30 inch wingspan model designed 55 years ago, to be competing in this company demonstrates just how viable this little jigger is.



What then, of my current version of the "Senator"? As there are already some definitive treaties around (including April '87 "SAM35Speaks") and me being a non-expert, this sketch is just a personal reflection of my own experiences. Like my other Rubber models, it resides for all its stored life in a closed/customized storage box along with its own pre-prepared motors and blast tube. The first image depicts the arrangement, which also includes a balsa former to "keep" the stabilizer flat and eliminate warping during storage. The flat portion of the wing is pushed tight to the edge of the box for the same reason. See also the removable fin and single undercarriage leg helping to minimize the box size for storage and transportation. My trademark décor consists of flying surfaces covered with Martin Dilly's white Jap tissue, applied shiny side down using neat thinners as the adhesive to enliven the pre-

doped structural members, water-shrunk (using steam) and treated with just two thin (30%) coats of shrinking dope and a similarly thin application of banana oil. I believe this method enhances the strength of the covering because the thin dope, applied to the matt side of the tissue, amalgamates more with the tissue fibers than is the case, if covered shiny side on top. The fuselage is covered with black Esaki Japanese silk applied with thinned down PVA. The stuck edges are then sealed with dope prior to water shrinking, before being treated with a single coat of thickish (70%) shrinking dope applied by the meniscus method. This very rewarding process prevents any pin holes developing in the finished surface. Basically the meniscus method uses an appropriate sized tee bar to drag a patch of open weave tissue continuously along the full length of a fuselage surface whilst dropping and gently spreading the dope generously across the width of the patch with a dope brush. No pressure is applied by brush or tissue and the dope distributes evenly, remaining on the surface of the silk. The whole deal dries without pinholes. Too thin and it does not work, too thick and it globs through the silk. A brief experiment leads to the right viscosity. The tips and bits are treated to spray-on dayglo from a Halfords can.

The logic for these color choices is rooted in my belief that the black fuselage maximizes visibility in the air, the pure white surfaces show up best on the ground



whilst the obvious advantage of dayglo is best experienced when searching in long grass or crops. And why silk? Well, it has tremendous ability to prevent fuselage destruction in accidental motor bursts and crashes at launch due to turbulence or pilot error. In addition it is extremely easy to repair with no weight penalty.

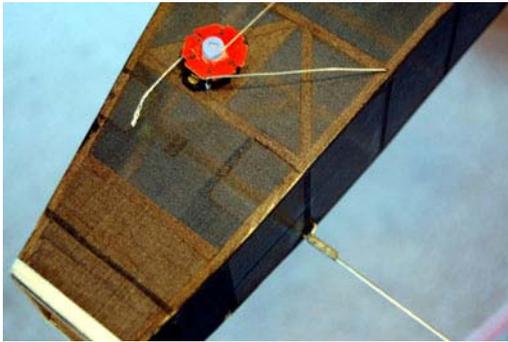


As well as the removable fin and U/C leg, this model has other quite interesting features. Firstly the propeller is carved from Jelutong. It's a strange wood with a non-invasive grain. By this, I mean it does not interfere with carving. In fact it's very much like carving a piece of soap, it is so easy, used widely in commercial pattern making, due to this feature. Being a heavy wood it allows for the blades to be shaped a lot thinner than a balsa version and as such is ideal for this particular model because the "Senator" has a fairly forward wing position and to get the CG correct a slightly heavier than normal propeller and nose block is advantageous. My experience is this wood has no serious vices if used for carving medium size propellers.



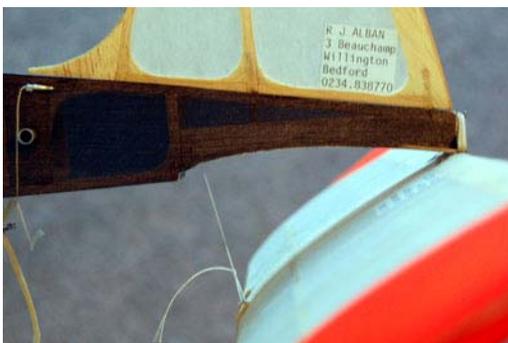
The clutch mechanism is a simple and safe design and from the image it is easy to see the single loop which catches a pawl to drive the prop. It also doubles as a winding loop. The thrust/cup washers are made from two convex drawing pin heads, the "tube-within-a-tube" bearings are brass and the Teflon

washer is there to protect the hub face as well as to complete this low friction freewheeling method. The Coup de Gras of this little collection of bits and pieces is the small anti-reverse stub made from 1/16" aluminium tube to prevent the pawl coming around and catching the loop in freewheel mode. On the "Senator" the shaft would more resilient if made from 16 SWG instead of the 18 SWG piano wire used here. For 8 oz freewheeling Wakefields using this identical design but with a 14 SWG shaft is my normal bullet-proof option. The small amount of extra weight incurred is generally not an issue because it is often necessary to add avoirdupois hereabouts.



The removable U/C leg is a push fit into a plastic tube locked by a small stub fork bound and soldered to the leg. The same image shows the DT timer which is one of those "cheepio" devices used to control the opening of hatches on products like cassette players, etc, where shaft rotation is resisted by paddles moving through some such silicon type grease. The motive power is provided by a rubber link in the DT line, and whilst this timer can be temperature sensitive, it only

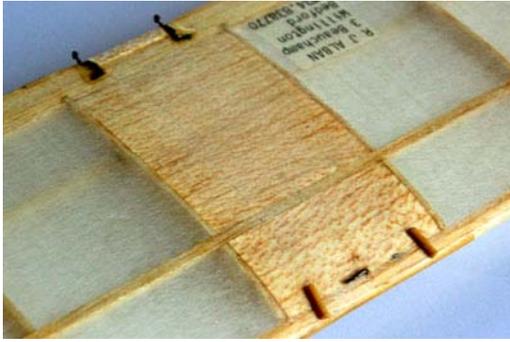
takes a few minutes to calibrate on the day. It is lighter but not necessarily better than a Tomy timer, however, it works fine. The timer release lever which goes into a small tube behind the calibrated disc engages with the indents and is popped below the disc by thumb pressure at launch. Alas, being a positive action (not automatic) it's not foolproof. Again, on the same image, the white band (still not blacked over) around the nose is a cyanoed whipping of crochet cotton to strengthen that area. This is another bullet-proof trick that will resist almost any kind of wizard prang, even those of a vertical nature under full power. On other photographs, just seen in the centre of the wing is a small hole for the radio tracking bug (retained by a small rubber band) that is absolutely essential in today's free flight environment.



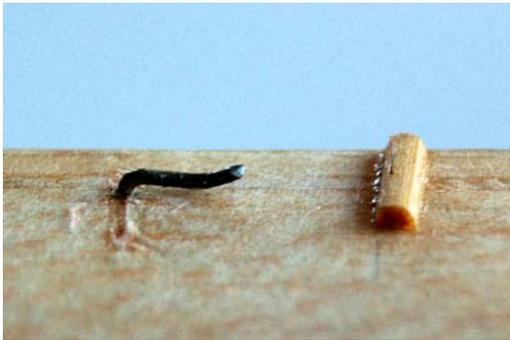
The DT is achieved by dropping down the front of the stabilizer at about 45 degrees. Close study of the image sequence reveals all the neat features incorporated here. A knot in the rubber-linked polyester DT line goes behind a slot in the timer disc. At the rear end it enters a small aluminium tube near the front of the fin, exiting internally above the front of the stabilizer where a loop is attached to a centrally placed hook on the stabilizer. The trailing edge is the fulcrum which fits snugly onto a fabricated platform.



Leverage for the action is provided by two small bands around extended hooks on the trailing edge and a single hook below the fin. Positive front location is achieved by two small bamboo bumps near the leading edge either side of the fuselage. The leverage bands also provide for positive rear location by virtue of the trailing edge hook positions in relation to the platform.



It's all very snug and to prevent undue wear on the bearing surfaces note the bamboo "kebab" stick inserts let into the trailing and leading edges of the stabilizer. One amusing observation with this DT is, in practice the model sometimes adopts a quaint "nodding" action during descent. This is because, as the model falls, there is a tendency for the tailplane to lift, inducing a slight forward motion which then snaps the tailplane fully deployed again to resume its vertical descent, and so it continues, nodding away like a parcel-shelf dog, dependent mostly upon the strength of the rear rubber bands and the drop-down angle of the stabilizer.



In practice, the "Senator" seems equally happy to accommodate short powerful motor runs as well as a languid, long running, slow climbing approach. Having tried both, I am finding the latter, seemingly, a bit better providing one is confident in avoiding bad air. As with all freewheelers it should be trimmed to fly right/right, but if using a short powerful motor I find there is a fairly narrow flight envelope between looping under full power and dropping the right wing to make a couple of fast low circuits before climbing away.



Either way, it's hair-raising, but I have an interesting solution. Basically the model is trimmed to stay well away from the "up-and-over" loop. Then to avoid being "tight-to-the-right", just prior to release, I twist the starboard wing inner panel down to provide a

significant but temporary wash-in for the model to lean on as it tries to go right at launch. Now under the influence of the high powered burst the model just goes vertical, turning right and rolling left in equal proportions until the initial torque is expended, the wing resets itself to normal and the climb-out becomes more sedate and disciplined. I suppose one could say that using a variable geometry wing in vintage competition would be decidedly non-U and politically incorrect, but hey, it's only smoke and mirrors without the gadgets. Too clever by half, methinks?

As readers might already be bored rigid with all this detail, it seems timely to relate some personal anecdotes from the early days at Cockleborough Farm. Latterly unavailable for free flight it is (was) a genuinely magnificent farm site, mostly blessed with "fields forever" punctuated with typical, Cotswold country, dry stone walls. What wooded areas there are did not often come into play providing the prevailing westerly's co-operated. Any drift from the east or north was always problematical. Anyway I had been flying my "Senator" in one of Mike Kemp's Vintage Lightweight bashes and had completed all three qualifiers, but dropping one flight. My mate, Paul Dancer was doing OK until his second flight landed on top of the largest Dutch barn in England (or so it seemed). Unable to make the retrieve he

requested the use of my "Senator" to complete the competition. With no regard for BOM, he proceeded to make the flight and, LOL, it also landed on top of the self-same Dutch monstrosity. We gathered up my (famous) poles for extracting trees from model airplanes and made our way towards the impossible task confronting us. The trouble with these buildings is you can't see anything close-up and have to retreat at least 200 yards in any direction to see objects on the roof, so using the poles was not going to do the business, never mind them not being long enough. Whilst we were uselessly contemplating our navels, bless me if two more models did not join the already elevated squadron. Now there were four! At this rate there would be no airplanes available for any subsequent fly-off! For mere mortals this was a ridiculous situation and all four pilots could not think of a viable solution. What we needed was either a 60 foot ladder or a steeplejack. Well, we got neither, but within minutes along came the next best thing. A youngish chap wandered over and quietly announced that he was a roofer. Within seconds he had scaled the trellised end supports of this massive shed and was scrabbling fearlessly onto the asbestos panels. Picking his way expertly above the supporting beams he rescued all four models and within minutes he was back on firm terra! All in a days work, or so it seemed! Actually, I think he was a radio modeler from an adjacent field who had seen the unfolding tragedy and came over to save the day. We hardly had time to offer thanks and he was gone.

At the same venue some years later, I had the misfortune to DT my "Senator", unseen, into a massive field of oil-seed rape. I had a very accurate compass bearing from the vertical DT, but absolutely no idea about the distance because of the undulating terrain. I navigated by dead reckoning to the near edge of the field and commenced the search by tying a white handkerchief high up in the fringing hedge, dead on line. I then proceeded to criss-cross the line, 50 yards either side, up and down the tractor lanes, using the sighting compass and handkerchief as a back



bearing land mark. After two hours of searching right across the field, I was making my way back using the same method when I spied the model deep down in the crop. Now, here's the rub! When I entered the rape field I was nattily attired in blue. When I emerged from the adventure the yellow pollen had transformed me into a jolly green giant and my good friend, Dick Hardwick was on hand with his camera to record my return to base. Everyone had a good laugh at my expense but I learned a lot that day about methodical retrieving by compass navigation.

Mike Kemp also had an unusual "Senator" experience at this venue. His model got away and flew across the A40 into a massive bank of trees. No way was this model coming down by itself. He even made a 150 mile round trip to Bedford to borrow my retrieval poles, but to no avail. Sometime later, at work, he was bemoaning the loss to his line manager, who duly announced he used to be a tree surgeon (or some such) in a former life and still had all the gear. Thus, they repaired to the scene of the crime, some 50 miles away, and the model was duly retrieved. Mike still believes he is the only person ever to send his supervisor up a tree to rescue a model airplane. Me? I only ever drove my supervisors up the wall! What fun?

Finally, a tall story involving the St. Johns Ambulance Service, a thunderstorm, an oak tree and a horse show. A "Senator" escaped from Cockleborough to alight in this massive oak tree situated in the grounds of a private park, hosting a local show jumping event. Try as we might, Bill Cox and I could not quite reach the model with the retrieval poles. Goggle eyed riders and spectators offered plenty of encouragement but there was no practical solution until a voluntary ambulance crew weighed in with a hard to refuse offer. They would drive their ambulance under the tree for me to clamber onto the roof. Bill Cox fed the poles to me one by one and I assembled them into the tree and poked the model out with style and aplomb. All the while a threatening thunderstorm was crackling around the area and I had this vision of a lightening strike sizzling down my wet poles, through me and into the ambulance. Obviously, it didn't happen, but I wonder what the local newspaper Gymkhana reporter would have conjured up for a headline if it had? At least, in the case of an accident I would not have had too far to go for medical help.

Thus I have shared my personal reflections on this really great little model airplane yet have hardly scratched the surface of its universal appeal. It's easy to build, easy to trim and easy to fly, with no serious vices, apart from absenteeism. It's a park flyer for the inexperienced and experienced modeler alike. It will hold its own at any competitive level, and in the hands of expert contest flyers it is a truly awesome performer. It features regularly in postal competitions and even has a single design worldwide event dedicated to its popularity. Can there be, I wonder, any more widely flown model that has belied its humble post war beginnings to become one of the most popular designs on the planet. Let's give it up for the "Senator"?

Ramon

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