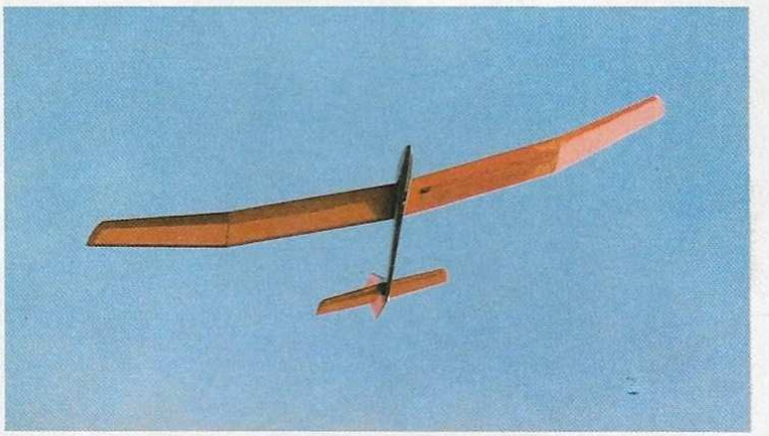
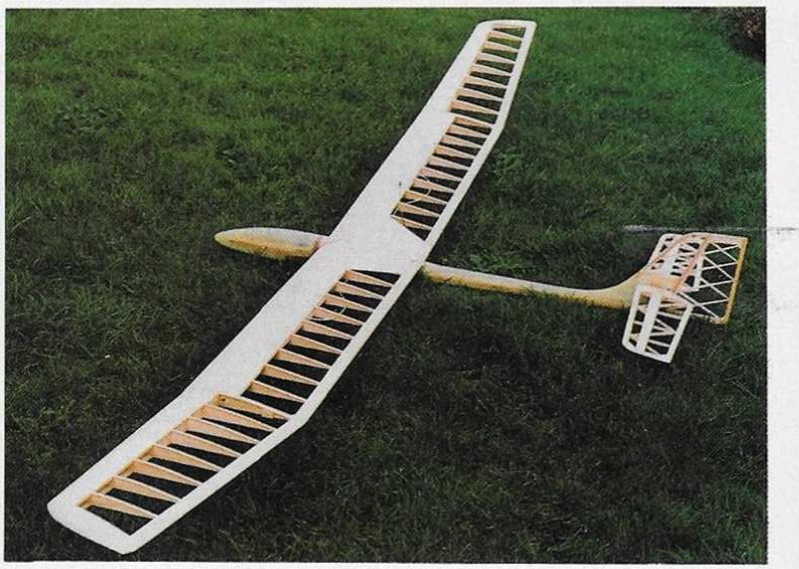
KIT REVIEW

Glider man Dave Jones tests the Airtronic Cumic

I HAVE TO SAY at the outset that I am a fan of Airtronics models. My interest started when I bought a damaged Sagitta. Now this model has lasted about as long as any other model that I have owned and has earned many maxes in competition. But alas, it has a limited performance envelope; there is no point using it in indifferent conditions, for it needs a little lift to make it work. On the other hand it



Heading: Dave Jones is suitably impressed with his Cumic after first test flights. Above: radio installation shown to be simple and uncluttered. Above right: Cumic up and away searching for the next thermal. Right: neat spoiler installation with cable linkage visible through the covering. Below: Cumic centre section with single dowel and bolt fixing. Below right: completed airframe ready for covering, finishing and radio installation.



launches promptly, zooms very high, handles nicely and is a good all-rounder. When I heard that Airtronics had come up with a replacement design I was naturally interested. Obviously, my friend the old Sagitta cannot possibly last for ever.

Cumic cuts

The Cumic kit incorporates the two versions of the model, Standard 100in. and the 117in. Cumic Plus. The 100in. version is the Sagitta replacement, whereas the Plus has an extended centre section (yet the same wing tips). I built the Plus for Open class work.

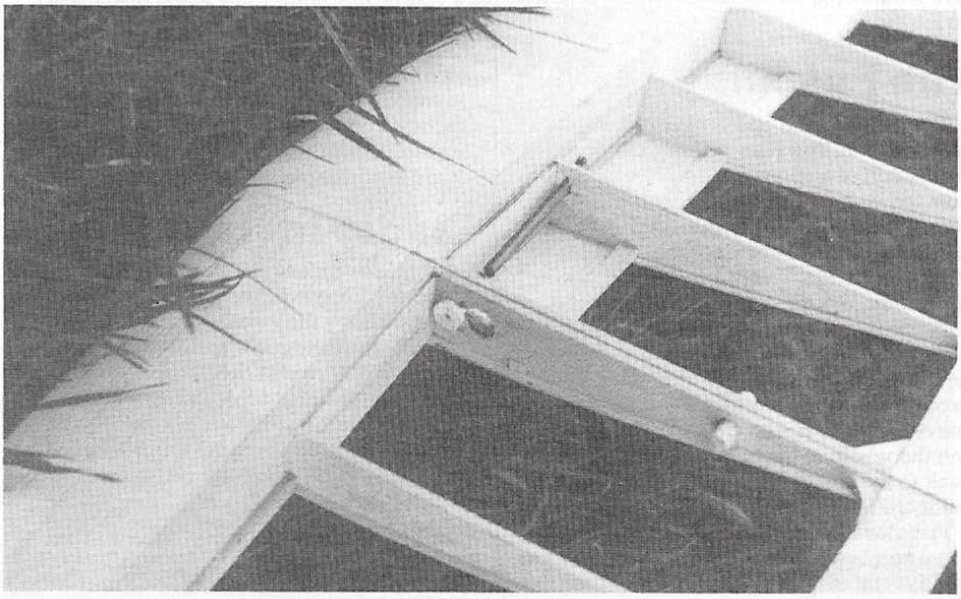
The first thing that impresses you when you get the kit is the standard of kitting. The box is sturdy and incorporates full colour graphics with a photograph. Now this may not mean much, but it does say a lot for the quality policy of the company who are not prepared to lose out because of poor presentation. Far too many kits are very badly presented. The model may be good but you often need to be experienced or psychic to understand how it goes together. Good graphics cost less in the long run; short term cost cutting is not really worth it given the convenience of desk top publishing. Steps down and puts soap box to one side.

Upon opening the box you are presented with a lovely sight; lots of bags of balsa and bits all cleanly packaged up with not a speck of dust or old newspaper packaging in sight. Soon is revealed a proper set of printed building instructions (fully illustrated), a nicely drawn pair of plans, some stickers, five bags of balsa, two bundles of strip wood, a full 'bits' package and a delightful fuselage.

This fuselage is a pretty glass epoxy job, incorporating a bolt on wing seat and a sturdy flanged canopy. The moulding quality was good with few bubbles in the joints. The fin stops short at about half its final height. More on this point later. The wing ribs are particularly impressive. The balsa ones are in 3/32in. material, crisp and light. This is a good move. Weight penalty is minor and the extra strength is really worthwhile. They are so crisp and exact that they look as if they have been machined to shape. Unfortunately they are not numbered, so you have to identify them with the plan and the instructions. Overall: very impressive, a pleasure to explore and delve into – and good value for money.

Pre-building Investigation

No experienced builder will build exactly to a plan. We all have our little prejudices and dislikes. First of all I went through the kit with a fine tooth comb to weed out any nasties and identify any missed opportunities. I was surprised to find that little needed changing – perhaps a bit of beefing up here and there; the use of different materials in a couple of cases and a modified radio installation were all that I felt was required for its use in Open class. I make no apologies for this procedure. A reviewer's duty is to be honest. Happily, for once, there is not a lot to criticise.



Junction of tip panel to centre section; Cirrus wing connection system used.

Tailfeathers

A nice enough place to start. Here I hit problem number one. It is necessary to measure the strip wood to identify it, for it is not numbered. On the other hand, this means that all the wood is handled, so it can be graded according to its purpose. The tailplane is a simple enough job but experience with the Sagitta suggested that extra ribs would prevent any tendency for the covering to bow the trailing edge. To this end three extra ribs were built in. In addition, shear webbing was built in to quarter span. The resulting tailplane, which was rounded off to a symmetrical section, has turned out to be very strong and light. Next up was the rudder. This time I doubled up the ribs (Sagitta experience again). 1/16in. spruce was also added to the base of the rudder for abrasion resistance. The fin extension should have been solid balsa but after that rudder I could not resist making the fin 'open structure'. A spruce framework was used with the leading edge inserted 10mm into the fuselage.

This lot took eleven-and-a-quarter hours; I tend to be slow builder. Building to the plan would halve that time. All glues were aliphatic, epoxy or cyano.

Tip panels

These fell together. Ribs fit the spars perfectly and the whole job was very painless. The joiners were left out at this point. My only gripe is that I had to trim each of the spar webs to height and accurately sanding end grain is a pain. Time taken, 16 hours 45 minutes.

Centre panel

This is the major component of the model so extra care was taken in examining the plan. A good job too, because of the model's two wings. The plan shows the left half of the 100in. version and the right half of the 117in. version. Confused? I was till I realised that I had to draw out the extra three bays and tape them onto the plan in order to complete both halves of the big wing. Nitpick number one.

The wing chord on this model is ten inches so there is plenty of spar depth. This means that there is plenty of space in the wing. At this point three braincells ganged up and came out with the idea of sticking the airbrake servo in the wing. Lots of advantages here; permanently connected airbrakes and the convenience of just plugging to a flylead rather than fiddling with some cords in the fuselage. A major modification this, but one that has no effect on the flying performance. A standard size servo fitted snugly behind the spar at the root and the guide tubes were duly rerouted; no problem. The airbrake slots were fully boxed in to prevent rubbish getting into the wing.

Building was very easy. Everything fitted neatly together and – joy of joys – the spar webs were accurately pre-shaped. This was fun. The ply parts had a lot of release wax on them, but this sanded off easily. The centre section uses a piece of 3/8in. ply which had to be shimmed a little to make it fit, otherwise it all dropped together. Extra gussets were fitted on all the centre ribs since they are under a lot of strain on tow. When the wing halves were completed they were carefully aligned and joined with slow-setting epoxy. The tip joiners were then installed, alignment being particularly easy since the panels can be held together with a bulldog clip.

Nitpick number two: the plans give no indication of how to keep the wing tips on the centre panel. The obvious solution is to tape them on. Just for fun I installed an

ex-Cirrus wing retention system. Time taken, including the modification: 29 hours 30 minutes.

The Fuselage

The joint and the openings were cleaned up in no time. The plan calls for the installation of a spruce side rail from the front to just under the wing. I extended this back to the tail just to be sure, because the Aquila had a bad habit of cracking behind the trailing edge. This was achieved by using foam blocks stuffed down the boom to hold the spruce in position whilst it was curing. Not really necessary – but I prefer to repair things before they get broken. Later experience would indicate that for heavy-duty use it would be worthwhile to line the whole of the inside of the fuselage back to the trailing edge with Kevlar cloth, but more on that later.

The elevator linkage came next. One big 'plus' point – the all-moving horn is the best commercial unit that I have come across, the essential triangulated piece being moulded in. Not so good was the pushrod set-up, possibly the worst seen in a kit (nitpick number three). The wooden rod is OK, I suppose, but the long overhangs and doglegs in the joining wires are a sure recipe for slop. I used a straight carbon fibre tube with the shortest possible wire joiners. This runs along the side of the fuselage and has no slop at all. The rudder uses a pushrod too. I replaced this with a closed loop set up, the outer tubes being built into the fuselage. A lighter and more forgiving arrangement.

Moving to the front, the wing was tailored to its seating and the front peg installed. This was adequately designed but I changed it to a tube in the leading edge and use a piece of GRP rod. Overkill maybe, but it saves having to dig out a broken peg if the worst happens. The location hole was located and opened up to take a tube. At this point the wing got jarred in taking it off and an excessive force was applied to the fuselage. It showed a fine crack in the bridge that carries the wing, so I filled that part of the moulding with Kevlar and secured the wing tube with an epoxy filler. This is a worthwhile modification. Take the reinforcement down the side of the fuselage while you are at it, then put in the side rails (if you decide to). The retention screw was changed for a unit that I have standardised on. The fairing was then shaped up. The fuselage was initially designed for the Adante which has a HQ section. Early fuselage had to have a wing mod to fit the fuselage. Ignore these in the instructions and on the plan. Perhaps time for an update?

The canopy was quickly cleaned up and offered up to the fuselage. It was found that the side rails had pulled the sides of the fuselage in and that the centre looked a bit starved. To avoid this, reinforce with Kevlar and don't use the side rails. It isn't a problem so long as you keep this in mind when putting the servo mountings in. Use them to 'bell' the sides back out. The canopy is retained by a locating pin at the front. Nitpick number four (very minor this one) no mention is made of how to secure the canopy. I used a spring at the back with a couple of locating blocks on the canopy flange. No problem.

A missed opportunity (nitpick number five) is that the underwing area is not mentioned as a ballast box area. I have since installed a couple of captive nuts to retain ballast. The towhook and its mounting plate were very simple to install.

Radio Installation

This was a standard operation. No need to describe it here. I chose to mount the servos aligned along the fuselage rather than across, as on the plan. They were also placed at the rear of the cockpit so as to put the receiver behind the battery where it is more accessible. There is plenty of room even with the airbrake servo installed in the cockpit. The fuselage and radio installation took 31 hours.

Covering and Finishing

The flying surfaces were covered with transparent red Solarfilm, a particular favourite. It does not seem to get too hot in the sun and aids visibility in blue sky conditions. Nitpick number six: the ply ribs at the junction where the tips plug onto the centre panel are unsupported behind the D-box, so the covering tends to bow them. This is not a problem if the tips are taped on, but it does spoil the finish. The fuselage was filled, primed and sprayed in Graphite metallic car paint. Details were courtesy of Letraset and the transfers were grouped around the retaining bolt.

The airbrakes were then made up and fitted. The original ones are balsa, but I substituted aluminium ones since they are more suited to our climate.

Balancing came next. A cradle was made up and the model hung at its designated CG position. Chunks of lead were then taped on the nose till it balanced. A sixth of this was removed and the rest put to one side for melting. A rough nose mould was made by wrapping the nose in aluminium foil and stuffing it into a cup of damp earth. The ballast was then melted and poured into the mould. The basic ballast was then secured with an epoxy filler; of course, it was a snug fit in the fuselage. The model was rebalanced with loose sheets making up the fine adjustment. The finishing took 28 hours.

Flying!

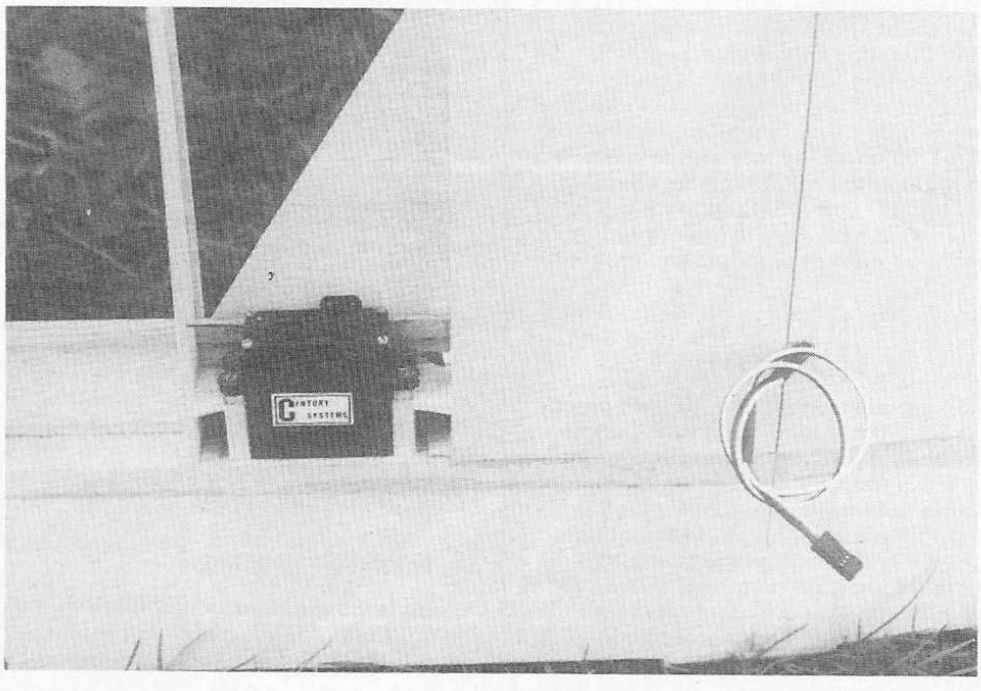
Before tests could commence it was necessary to make up some ballast. The problem was that the model had come out far too light at 53oz., a loading of 7.2oz.sq. ft. The fuselage and tailplane weighed in at 29.5oz. the wing at 23.5oz. The trouble is that the section used, E205, will not work well at such a loading A now well-known remark was made in a Sagitta review: the best thing that the builder did was to crash it, for the repaired model, much heavier, flew far better. I can confirm this. My Sagitta has to be flown with half ballast for optimum performance.

Six formal testing sessions were undertaken and the impressions were immediately good.

Towing was an anticlimax. The bungee pulled it up easily in a 10 to 15 mph breeze. The rate switching option on rudder was found to be helpful. Hand tow was good, clean and positive. The towhook needed tightening during the first session.

The stall was straight ahead and viceless. The airbrakes were good – not as powerful as a Sagitta and required a lot of 'up' elevator to hold the pitch change. Ensure the elevator rates are turned off before using the brakes. Turning seemed a bit odd at first; a bit tail heavy, so the CG was brought forward a little and this cured the problem. The general handling is very

Underside of wing shows spoiler servo installations. Dave used a linear servo in each wing, connected with a 'Y' lead.



pleasing with no surprises or bad habits. The model was given to Barry Cooper to try. He promptly got away for a seven-and-a-half minute flight (he has an annoying habit of doing that). His comment was that it flew like an Aquila. There are design similarities, but I think it flies like a big Sagitta.

All of the above was discovered at 8.5oz./sq. ft. It was a natural and obvious experiment to try it at 7.2oz. The immediate impression was that the model was dithery, lacking precision. Flying close to the stall revealed a strange sort of hesitation. The model slowed up, but didn't stall properly, this was followed by a wiggling motion as if it was deciding whether to tip stall. It then regained speed but height was lost in these odd movements. The times taken on one of those 'no lift' mornings would indicate that it was some 30 to 35 seconds worse off at 7.2oz./sq. ft.

A couple more sessions proved that it would loop very nicely. The slope session was easy meat for it, but it was not ballasted enough to roll. The penetration in a 15mph blow was good at 8.5oz. loading. Light lift was contacted on another session and the model took it easily to get the day's best of nine-and-a-half minutes. It was obvious by now that the model has to be flown off of the stall for best duration; slowing it up too much hurts the performance.

The acid test was a club comp against 4-metre Algebras and an own design craft. The average was 940 points per slot; not bad for a model with which I had little experience and, moreover, in conditions where the extra span of a '4 metre' becomes important. In competition I shall save it for the nicer days when there is some lift about. Dead conditions demand greater span. Flown to its good points in reasonable conditions it will be a competitive model; just don't expect it to match the big models in naff weather.

Conclusions

This is an excellent model, beautifully kitted and easy to build. A very good second or third model and a good choice when starting to fly Open Class. The option of building it as a 100in. model is interesting. One could make an additional centre section and have the best of both worlds. As a 100S class model it should be competitive. It may be a little expensive in this country but in my opinion the kit is good value for money and it should last a long time if treated reasonably.

Nothing is perfect so please regard my nitpicking as a matter of being hypercritical. The only serious one is the matter of the pushrod arrangement; the rest would be picked up as a matter of course by a competent modeller. This kit was a pleasure to build, hence the time taken over it. I have to admit to being a reluctant builder!

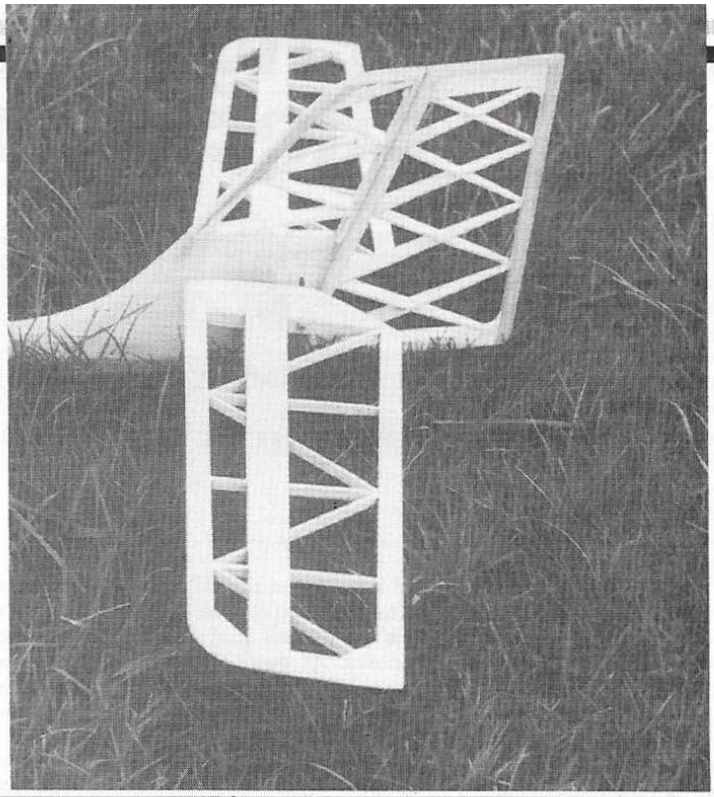
Postscript

The last testing session was windy. The towman and I were discussing the model. I said that there were some things that I would do differently; little did I known that I was soon going to get the opportunity . . . We had been going for faster and faster launches and were getting close to the launch times that the Sagitta is capable of; that is pretty damn quick. So the instruction was to go for maximum tension.

The gust did not help, nor did the fact that the towman was going faster than a poll tax evader. The model shrieked into the air and charged upwards at a savage and entirely unreasonable rate. I could see the wing bending and was still easing in the down when a panel sheared off. The nose took 15 minutes to dig out, having been embedded five inches down in dense clay soil. The front end was egg shelled and broken off. The wing was in big marginally dented pieces, it looked a mess but was a suitable challenge for an ex-jigsaw addict.

This launch was an exceptional case. For all normal purposes the model is perfectly satisfactory and will take anything that looks like a sensible launch. In its 100in. guise the stresses are lower so there should be no problem. The wing uses the same structure as the Sagitta so it should be OK. The cause was a bit of bad building on my behalf and some poor grain structure in the spar

Repairs? Kevlar internal reinforcement for the fuselage, full sheeting on the top of the centre section with geodetic bracing underneath. In accordance with current thinking, a knife-edge trailing edge has been fitted by the simple expedient of adding spruce to the trailing edge and shaping it up. The centre section spar has been deeply grooved with a quarter inch half round chisel on the top and bottom. The bottom has three tows of carbon fibre right across; the top has four tows right across increasing to twelve tows at the quarter-wingspan position. It has withstood a 15kg proof test easily so it should be able to withstand anything a towman can dish out. The top panels have had the root rib strengthened in the usual fashion. I look forward to outrunning the aluminium plumbers on tow this year!



Completed tail prior to covering. The kit features a sheet rudder, but model is shown with Dave's built up version.