Electric Haze *looks as good as it flys - and it flys pretty well. 10-15 minutes per quick-charge on a power climb to height, switch off and glide, then climb away again basis means fun whichever way you look at it! Right,* **Electric Haze** *with its i.c powered cousin* **Purple Haze.**

ELECTRIC HAZE

Anything for a quiet life! Build this 38¼ in. span electric powered beaurocracy beater by Ian Peacock.

THOSE OF YOU who may have followed my EMF column in our sister publication *RCM&E* will be quite aware of my feelings toward the local Borough Council. Being of somewhat bloody-minded bent *(you're telling me! Ed.)* and of long memory, it has been my ambition since the establishing of that insidious by-law, outlawing from all public parks:-

a) Power driven model aircraft
and
b) All other model aircraft of span greater than 1 metre
to find a chink in the system.

As the appended definition of 'power driven' refers solely to 'the burning of combustible fuels', it left only CO_2 or electric as available power sources.

CO_2 as a power source for R/C proved to be a non starter for, although successful flights *were* achieved, the ultra low power that was available required very light models and very, very light radio. Furthermore, duration of power run was very short - usually less than 60 seconds, and could only be achieved in warm, wind free days. My initial feeling about electric was not too bright either and my first attempt was to rubber band a Ripmax Cyclone (RS540) into the front of a *Purple Haze* with very mixed results.

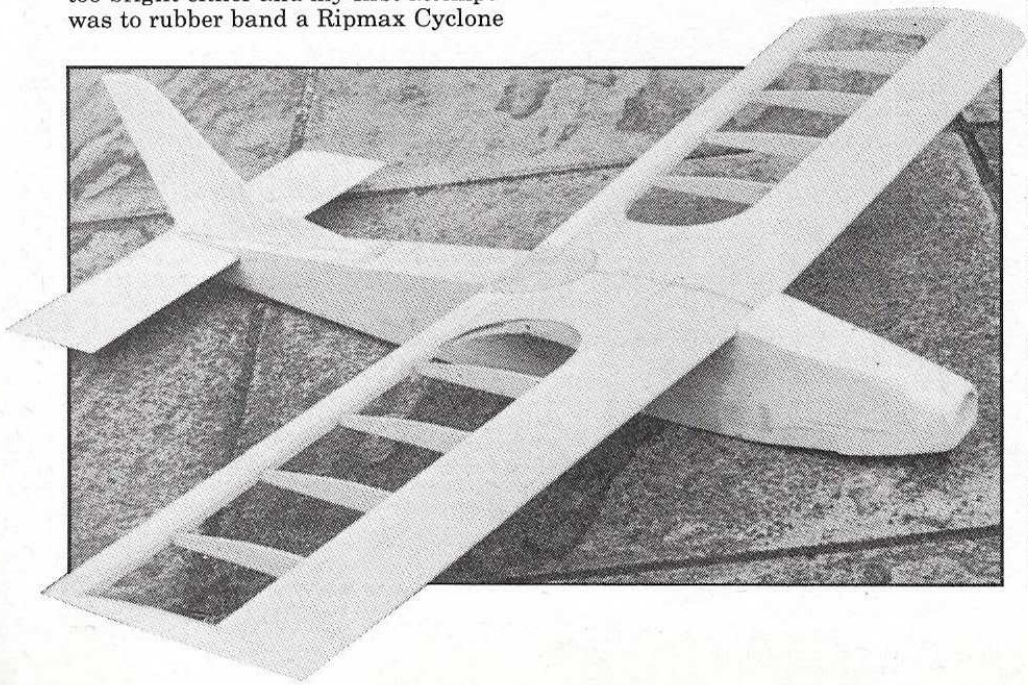
The *Purple Haze* was a high wing cabin model for 0.15 cu.in. motors and 3 functions of R/C. Despite its 'trainer-like' appearance it was no slouch, and was built at about the time that David Boddington was formulating the Club 20 racing rules. It met these rules exactly and was not only fast but aerobatic to the point where near-axial rolls could be achieved on rudder only (it had no ailerons).

Purple Haze was originally inspired by seeing a model flown by local clubster Gary Pope. Gary built his original from an American plan published in *R/C Modeller* entitled *Quicky*. Regrettably, Gary's model was demolished somewhat rapidly when the wing folded in the centre. However, the couple of flights that I witnessed were enough to inspire a sort of 'anglicised' version with the inevitable Peacock swept fin. (Funny really - a lot of my models have this feature - even the ubiquitous *Tyros* and *Tyro Majors* that we *still* use for basic training!)

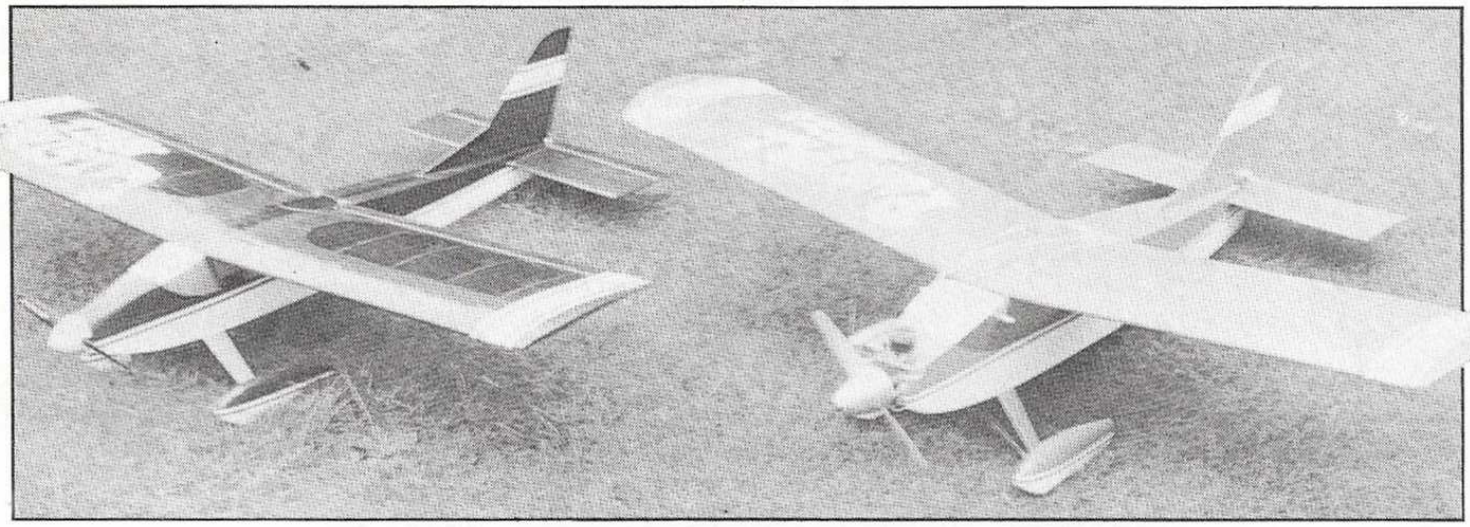
However, as it stood, and despite the hundreds built, the *Purple Haze* was really the wrong shape for electric flight and I began to sketch a series of modifications to overcome the problems. Reduced dihedral, strip ailerons and a change to a lighter wing structure all seemed valid, but it was another *R/C Modeller* design, the *Wasp* by Jim Zarembski, that really stung (?) me into action. So similar was Jim's *Wasp* to my new slim-line 'Haze', and so successful was its flight performance that I immediately got out the balsa knife and finished off what I had started several years earlier. I'm not sure whether my results are quite up to those achieved by Jim in the States but I'm more than satisfied that the result was worth the effort.

In the *Electric Haze*, the family resemblance still remains and so does the performance. It satisfies me as a weekend flyer, being reasonably quick and sufficiently aerobatic to stop me from going to sleep whilst flying!

Flight duration whilst hacking around close to the ground is around 5-7 minutes dependent upon motor and battery pack used but, flown carefully, 12-15 minute flights are quite practical.



Electric Haze *is quick and easy to build; note straightforward box fuselage and simple wing construction. Take care during balsa selection, however; the lighter the finished model, the better the performance - all up weight is much more critical with electric power.*

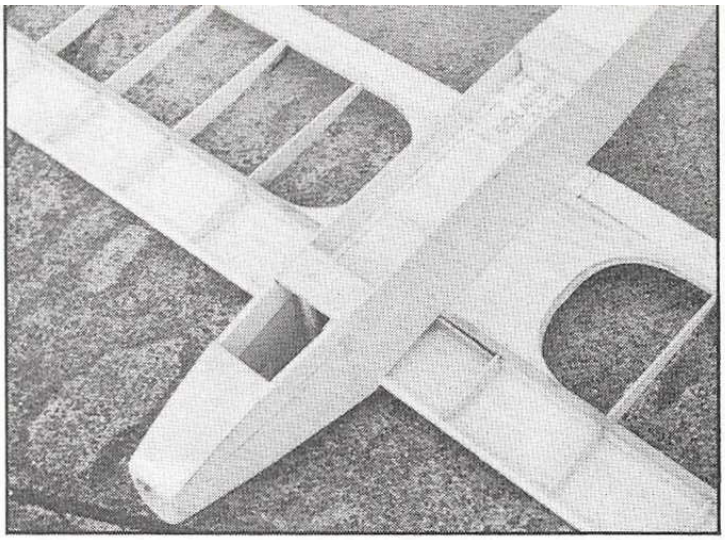


Although not part of its design criteria, the all-up weight is less than one kilogram with a good buggy motor and seven cells, no less! So, as an added bonus, the model is eligible for the 1kg event and by the flight results I've had, I feel that it might make a strong contender.

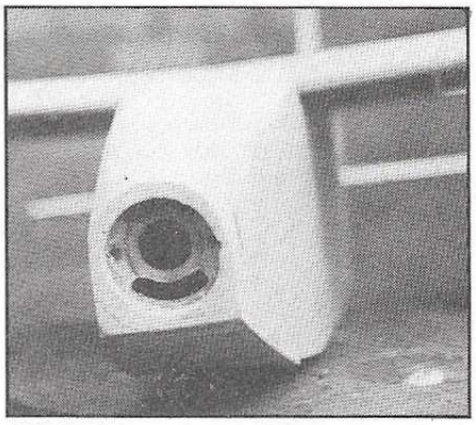
Structurally the *Electric Haze* is a mixture of styles, none of which should present any difficulty but for the newcomer to electric flight it may well pay to run quickly through the basic assembly.

Wing

This is built first and consists of solid balsa leading edge and trailing edge, spruce upper and lower spars with balsa shear webs, ply dihedral brace and balsa ribs. Initially I was intending to sheet upper and lower leading edges but, having read about Jim Zarembski's *Wasp*, I elected to sheet only the top. Wing tips are from 1in. × 1in. × 45° balsa. Wings are built in two halves and butt joined with the



***Underside view of partially finished airframe showing nicad space directly beneath wing. Business end (left) or* Electric Haze *prior to motor installation. Bottom right, original* Purple Haze *(No. 4) fitted with Ripmax Cyclone motor eight years ago; not a great success but the problems encountered and solved resulted in* Electric Haze.**



dihedral brace inserted. My original had the aileron servo in the centre which led to radio installation problems and therefore the plan shows it offset to the left.

As with the rest of the model, wood selection is of paramount importance for it is essential to keep the weight within reasonable bounds to ensure good flight performance. I'm not particularly adept at selecting timber but I still managed to achieve a covered airframe weight of only 8ozs. Visit your model shop with a spring balance and weigh each sheet, the plan gives an approximation of what each sheet size should weigh to act as a guide. Alternatively, shop by mail with one of the specialist wood suppliers (the Balsa Cabin, for example) asking for *light* balsa throughout.

A small amount of dihedral is incorporated (the original *Purple Haze* had quite marked dihedral). This is not a requirement of good flight performance but is incorporated from the appearance point of view. The relatively low amount of dihedral provides little in the way of additional stability and the wing could, quite justifiably, be built flat. However, flat wings always seem to appear 'droopy' (whichever way up they are) and I find this optical illusion unflattering to the model. Furthermore, British balsa, despite its supposed metric dimensions still comes in 3 foot lengths and to achieve the exact metre wingspan a centreline join is required, therefore - dihedral.

For the cost-conscious, a small reduction in wing span (simply lop $\frac{7}{8}$in. off each wing panel) will enable the wing to be built in one piece from stock length sheet and strip - in which case dihedral may be omitted to taste. Either way, I would still advise the use of the ply dihedral (?) brace. Centre section sheeting extends only out as far as the immediate centre section but can be carried out one more rib bay providing that the wood selection is good. Remember - too much wood and the weight will escalate.

Final details include a single 3/16in. dural dowel ($\frac{1}{4}$in. hardwood dowel is shown on the plan for those of you who don't have access to dural) at the wing leading edge centre (fits into slots pre-cut in the centre ribs), 3/32in. balsa shear webs and suitable reinforcement where the wing bolts go through the rear of the wing. Commercial aileron torque rods are used but please note that left and right torque rods differ in length as the aileron servo is offset. If possible, make all assembly with cyano adhesive as there is a great weight saving over the more conventional PVA and Epoxy adhesives.

Fuselage

This is a simple, all sheet box with suitable internal stiffening. Take care to match the wood selection for both sides and to produce a left and right hand side. Before fitting the rear fuselage top - fit elevator servo temporarily — note that it fits on the right hand side of the fuselage to avoid clashing with the aileron servo dangling from below the wing. Set up pushrod or bowden cable positions, also bowden 'outer' to carry the Rx aerial through to the rear. The fuselage front is a little unusual in as much as there are thick, soft, nose laminations *in front* of former F1. Former F1 should be made carefully to accept the motor being used as this is the *only* place that the motor receives any support. The additional laminations are added to bring the front forward to the back of the spinner, and to avoid an unsightly gap.

A false floor separates the R/C equipment and the main flight nicad and a removable fuselage hatch enables batteries to be quickly interchanged. Undercarriage is an optional luxury - it adds a lot to the appearance but does increase drag and weight. In general it is, perhaps, best kept for runways or for flying from the local park (Hooray!). Leave it off for anything other than smooth landing surfaces. The nicad hatch is 1/16in. ply which will take the rough and tumble of belly landings in pasture type flying fields. The nicad bay is large enough to take 6, 7 or 8 cell packs whether in twin parallel sticks or in line abreast but one should be aware of the location of the C of G and position the nicad within this box using scraps of polystyrene foam to keep the battery from moving about.

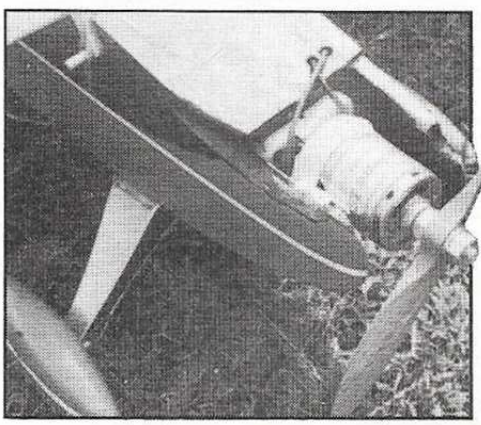
As drawn, it is assumed that the batteries will be removed (and interchanged) for charging but it would be no problem to mount a suitable charging socket on the side of the fuselage if it was a requirement to charge *in situ*.

Tail assembly

Tail items are all cut from light, soft 3/16in sheet with the corners suitably rounded and sanded smooth. Covering is a matter of taste but, again, keep it light. Tissue or one of the modern lightweight iron-on fabrics would be OK but avoid adding paint detail other than the lightest coat with an airbrush. Mine was covered in purple (naturally) transparent iron-on film with white trim.

Radio installation should present no difficulty; most modern equipment will fit in the space allotted to it. However, in the quest for this light weight, mini radio is quite a help. I've used three brands over the years, Cannon, Fleet and Futaba and, of course, there are others. Regrettably Cannon does not seem to be available in the UK, necessitating mail order from overseas. Fleet and Futaba are both currently available, however, and I fitted Futaba in the *Electric Haze*. This is no detriment to the Fleet equipment, in fact, I've had the two Fleet systems for over a year now with no trouble and perfect results, which should recommend it to anybody! The Futaba outfit is a more recent acquisition and was used 'because it was to hand'. I really didn't want to disturb the radio installation in the two Fleet equipped models on the grounds that I still fly them a lot!

It is quite feasible to use a battery eliminator/motor switch such as has



ELECTRIC HAZE

been published in our sister magazine *RCM&E* previously, but the weight saving with miniature Rx nicads becomes a bit academic. It does, however, overcome the motor control. I didn't have one to hand at the time, so I used an electronic on/off switch from the third channel. This switch is marketed by Star Electronics and, once more, behaves faultlessly. An alternative solution is to trigger a micro switch from the third servo. Either way, watch the weight, and position items carefully, for, whilst there is sufficient space inside the fuselage, there is not *so* much that it can be wasted.

With reasonable care, the all-up, ready-to-fly weight should be just under a kilogram and with a bit more care one may well be able to knock off another ounce or two. Performance of the *Electric Haze* is just what you want to make it for it revolves largely around one's choice of motors. Initial flights were with an old style Astro 075 (RS550) and performance was adequate on 7 cells using a Taipan 7 × 4 prop.

The majority of buggy motors are suitable, the Le Mans series from Ripmax or Cougarcraft being of particular interest. Also, the variations on the theme of Yokomo are worth more than a passing glance. Top line performance can, as expected, be achieved with equal top-of-line motors. The Leisure 05 is a good unit, but fitted with the Astro Cobalt 05, the *Electric Haze* takes on a performance hardly removed from its OS15 powered predecessor.

Of the many motors that have appeared recently on the market, Mick Goddard's (of MG Models) Yokomo-based units are worthy of investigation. Mick, and others like him, has been long established as a source of supply for the electric car racing brigade. More recently, he has turned his attention to the electric flight scene and it was one of his range that we eventually settled for. His ball-raced and triple-wound 'Magnum' sells at around £35 and seems to be an ideal compromise in both power and cost between the stock RS540s at less than £10 and the Cobalt magneted 'super motors' at around the £80-£100 mark. The new £40 Cobalt motor from SLM/Century Systems/Mole Technology also makes an excellent choice. However, the choice is yours, remembering to check that the motor mounting holes in F1 *must* align with the motor of one's choice.

Flying is almost an anticlimax for *Electric Haze* has no vices. It will take off from a smooth surface in about 30-40 feet or can simply be hand launched. Level flight is fast enough to be safe, lively without being a handful. Hands off flight is the norm with only a dash of down trim to achieve inverted hands off! Rolls are clean and crisp and loops smooth and round; Outside loops are no problem either. As yet I have been unable to get the *Electric Haze* to spin (its predecessor was particularly good at this manoeuvre) but this is because I have erred on the forward side with my C of G position. Moving it carefully rearwards ($\frac{1}{8}$in. at a time) will, I'm sure, overcome this small problem. Surprisingly for only 1 metre span and a little over 300sq. ins. of wing area the glide is good, retaining full control right down to the stall.

Using Star Electronics' motor switch I have been able to climb out to a level at which I could barely still see the model, switch off and glide. When back down to 10-15 feet, the motor was switched on again and the whole excercise repeated. On an average day, ie not one with huge thermals, flight times in the order of 10-15 minutes are normal.

All in all then, I hope that the results of a couple of years' electric flying coupled with ideas and tips gleaned from other electric flyers round the world, has produced a good, all-round flyer to suit the majority, whether established electric flyers or newcomers looking for a place to start. Hopefully this coming season will see a great deal of electric flying in which the 'Haze' will play an important part.