

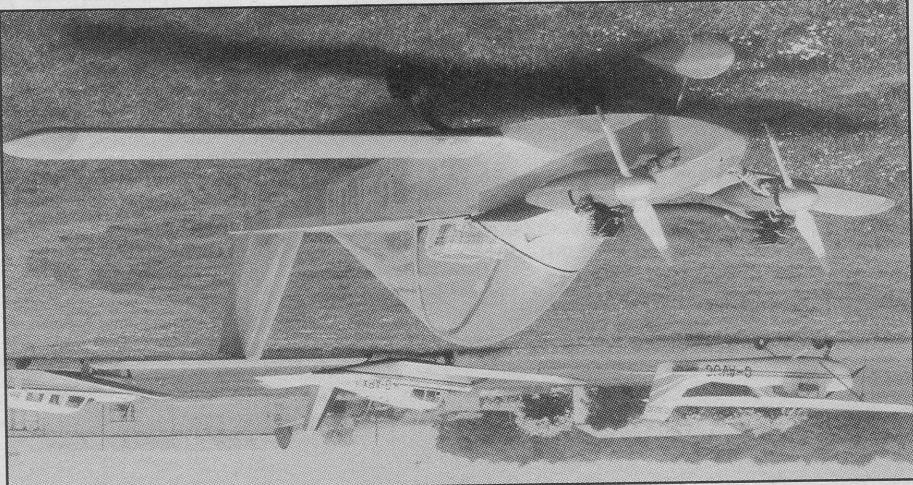
This particular incident was on the report to Air Traffic Control. Flyings Evening Association International Rally at Cranfield, ever seen in Europe, single aerodrome, ever seen in Europe, and at the FIA Rally, things are different. In spite of the intensive traffic, little use is made of Cranfield's radio facilities, most movements are strictly non-radio activities, and though there might be twenty or more aeroplanes in the circuit at any one time, there are hardly ever any conflicts". And, I think I am right in saying, no accidents.

The incident first mentioned took place as we late arrivals, "Total Aviation Persons", all, were giggling our tents alongside our aeroplane - another weekend enjoyment aside from our aeroplanes - and was heralded by the FIA weekend - and twin engine sound, but revving

A
T ANY "normal" aerodrome, where more than three aero-planes in the circuit is often regarded as "congestion", the sight of a twin-engined type flying downwind along the active runway at about twenty feet, inverted, would cause an outburst of surprise and demands that "the pilot to bring his aircraft in to land at once".

Peter Russell describes the amazing Cri-Cri.

- Small, aerobatic and twin engined -



cri-cri

good deal higher than what we are accustomed to. Then we saw it, a sleek little shiny metal device with two closely spaced engines either side of the nose on short "stalks". The inverted bit was only the start. We were then entertained by a quite elaborate aerobatic display, and while this certainly aroused considerable interest, there were no other repercussions, although I believe the display pilot was asked to "tone it down a bit" for the official displays on Saturday and Sunday.

Most of us knew about the "Cri-Cri" of course, produced by Michel Colombe in the early eighties, but this was the first time we had seen one "in the flesh". With a sixteen foot wing span, it was even smaller, in fact, than some of the models seen at the Aeromodeller "Scale Weekend" a few weeks earlier, all-metal, just big enough to hold an average sized pilot and powered by two 150cc two strokes developing twelve bhp at 6500 rpm.

I later had a chat with the pilot, one Paul Duval (or it might have been Derval, communication was a bit difficult due to the throng of people wanting a closer look) and learned that the Cri-Cri was available in kit form from the firm well-known to home-builders, Zenair of Ontario and Seattle. Some of the enthusiasm evaporated, however, when the price of the kit was mentioned - eighteen thousand dollars if I remember correctly.

The structure

Not strictly a Micro-light - it fails to meet the stall speed criterion of that definition - it is, nevertheless, very light and can be lifted by two normal-sized people, one under each wing, without, judging by the various demonstrations at Cranfield, any unusual effort. With



Low cross sectional area and streamlined "pilot fairing" give the Cri-Cri a remarkable performance on its 24 bhp. The high mounted "slab" tailplane has a bunjee biasing system.

an empty weight of 160 lb., this means each lifter has to bear only eighty pounds. Apart from that, the structure and aerodynamics are a definite cut above most Micros. The metal skinned wing is based on a riveted up main spar assembly to which is added thirty two high-density foam ribs. These are of a pretty sophisticated 22% thick section, near symmetrical with the blunt leading edge and rearward point of maximum thickness, not unlike some of the latest "super-critical" sections that are fashionable with the high performance brigade. With a wing area of only thirty four square feet, the stall speed might be unacceptably high without the Junkers-type "double wing" flaps - the sort that enabled the portly "Tante Ju" to get in and out of small, rough fields that would have defeated any other transport - which double-up as ailerons via an ingeniously simple mixer coupled directly to the stick.

With the ribs assembled onto the

spar, the next bit is a mite radical, too. The epoxy is applied to the structure and the pre-bent skins slid into place. The whole thing is then enclosed in a sealed plastic bag from which the air is sucked by a domestic vacuum cleaner - presumably a fairly powerful one - this applies an even, overall pressure ensuring adhesion integrity and eliminating tedious clips and clamps; an idea that might be worth trying when applying sheet balsa skins to model wings, if only to avoid the tedious business of sticking in all those pins and then later having to remove them.

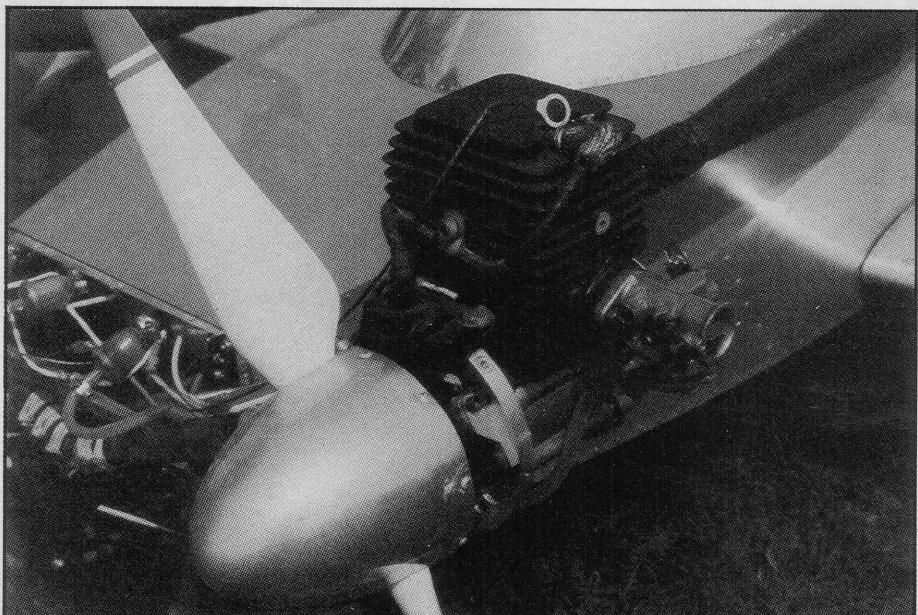
The double wing "flaperons" confer a bonus in that no cut-outs of any sort are necessary so that the structural integrity of the wing is significantly increased. The flaperons are operated by torque tubes that plug directly into the appropriate sockets in the fuselage, so that there are no internal systems in the wing, simplifying both construction and later maintenance, while the entire surface of the wing is completely free of any excrescence apart from the flap brackets at the extreme trailing edge underside.

The fuselage of the Cri-Cri is of rectangular section, sheet metal skins blind riveted to light alloy angle sections, stiffened by foam and bent-up sheet metal formers. The canopy hinges to the right and gives a full 360 degree view to the pilot - what a shame few pilots have 360 degree necks! The tail is a simpler version of the wing with a normal fin-rudder but an "all-flying" "T" tail that this writer is not madly keen about.

The undercarriage comprises a bunjee-sprung, steerable nose wheel and a one-piece main gear of unidirectional glass/epoxy with 3.00 x 3 wheels all-round, brakes on the mains.

The engines are 150cc "Valmet" types, incorrectly referred to as "two cycle" in the handout. They are, in fact two strokes (two cycles would be four strokes - get it?) developing 12 bhp at 6500 rpm or 10 bhp continuous rating. The carburetor is of the mem-

Close up of the Valmet 150 cc two stroke engine. Carburetors similar to those fitted to model engines, enable the engines to keep running in any position.



Getting the relationship between the physical size of suitable engines and the scale of the airframe might need careful thought and the stalk mounted engines will need a careful anti vibration mounting, otherwise such a project should be fairly straightforward. Main dimensions of the real one are as follows: Span - 16ft, length - 12' 10", aspect ratio - 7.8. Normal wing loading is just over 11lb/sq.ft.

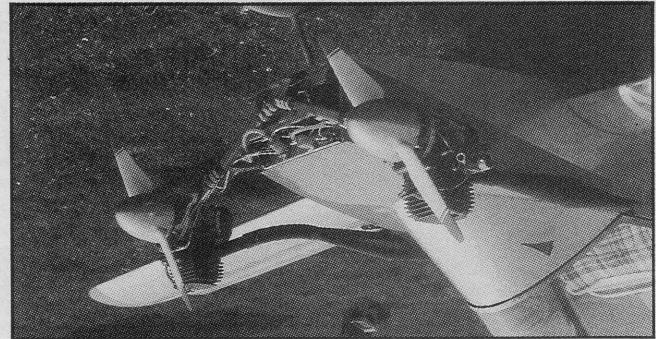
While conventional basa or basalt might be a bit more enterprising to duplicate the metal of the real one, at least as far as the skin is concerned, it might be a bit more original to construct it from epoxy "spring" main undercarriage is becoming very popular and has excellent characteristics as well as a long and maintenance-free life.

We have already seen one or two models of the Cr-I-Cr and it certainly has much to recommend it from the modelling point of view. Construction could be very simple. Constructional features of the Cr-I-Cr and its certain aeroplanes, this one has 1.5 slight complication being that, like all ends could also be very simple, the only good degreees of washout. The dihedral, by

With modelling in mind

The approach is continued at about 70. Here another idiosyncracy appears in that "flattest glide" or maximum lift/drag ratio - it's the same thing - occurs at a different angle of attack than the flaps. The flaps are usually 12 degrees. This is unusual in that with virtually every aeroplane I have come across, any flap reduces the L/D. Perhaps something to do with the unusual flap design. There is a cautionary note that the full span flaps are very efficient and should be applied with care. In particular pilots are warned never to raise the flaps near stall speed. The flaps are taken out not to flare too high, falling high with a suggestion that care must be taken not to flare too high, falling to appreciate the unusually low seat height is normal, just slightly nose-down on the ground, regardless of airspeed.

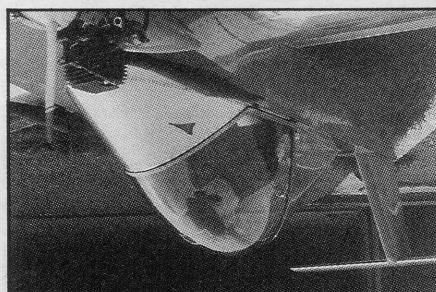
This review shows the flexibility mounted welded steel tube engine mounts and the fuel fittings. Propellers are 27". In diameter and of composite material. Nose gear is a bungee sprung "oleo". And the main wheels are mounted on a glass/epoxy one piece "leg".



The speed should be reduced to about 80 before selecting "take-off" trap then

The start comes at indicated air speeds of 51 and full flap (27 degrees) at 12 degrees襟翼爬升率。爬升率在每小时15英里以上，爬升率为每小时12英里。爬升率在每小时12英里以上，爬升率为每小时10英里。爬升率在每小时10英里以上，爬升率为每小时8英里。爬升率在每小时8英里以上，爬升率为每小时6英里。爬升率在每小时6英里以上，爬升率为每小时4英里。爬升率在每小时4英里以上，爬升率为每小时2英里。爬升率在每小时2英里以上，爬升率为每小时1英里。爬升率在每小时1英里以上，爬升率为每小时0.5英里。爬升率在每小时0.5英里以上，爬升率为每小时0.25英里。爬升率在每小时0.25英里以上，爬升率为每小时0.125英里。爬升率在每小时0.125英里以上，爬升率为每小时0.0625英里。爬升率在每小时0.0625英里以上，爬升率为每小时0.03125英里。爬升率在每小时0.03125英里以上，爬升率为每小时0.015625英里。爬升率在每小时0.015625英里以上，爬升率为每小时0.0078125英里。爬升率在每小时0.0078125英里以上，爬升率为每小时0.00390625英里。爬升率在每小时0.00390625英里以上，爬升率为每小时0.001953125英里。爬升率在每小时0.001953125英里以上，爬升率为每小时0.0009765625英里。爬升率在每小时0.0009765625英里以上，爬升率为每小时0.00048828125英里。爬升率在每小时0.00048828125英里以上，爬升率为每小时0.000244140625英里。爬升率在每小时0.000244140625英里以上，爬升率为每小时0.0001220703125英里。爬升率在每小时0.0001220703125英里以上，爬升率为每小时0.00006103515625英里。爬升率在每小时0.00006103515625英里以上，爬升率为每小时0.000030517578125英里。爬升率在每小时0.000030517578125英里以上，爬升率为每小时0.0000152587890625英里。爬升率在每小时0.0000152587890625英里以上，爬升率为每小时0.00000762939453125英里。爬升率在每小时0.00000762939453125英里以上，爬升率为每小时0.000003814697265625英里。爬升率在每小时0.000003814697265625英里以上，爬升率为每小时0.0000019073486328125英里。爬升率在每小时0.0000019073486328125英里以上，爬升率为每小时0.00000095367431640625英里。爬升率在每小时0.00000095367431640625英里以上，爬升率为每小时0.000000476837158203125英里。爬升率在每小时0.000000476837158203125英里以上，爬升率为每小时0.0000002384185791115625英里。爬升率在每小时0.0000002384185791115625英里以上，爬升率为每小时0.0000001202092895557625英里。爬升率在每小时0.0000001202092895557625英里以上，爬升率为每小时0.00000006010464477788125英里。爬升率在每小时0.00000006010464477788125英里以上，爬升率为每小时0.000000030052322388940625英里。爬升率在每小时0.000000030052322388940625英里以上，爬升率为每小时0.0000000150261611944703125英里。爬升率在每小时0.0000000150261611944703125英里以上，爬升率为每小时0.0000000075130805972285625英里。爬升率在每小时0.0000000075130805972285625英里以上，爬升率为每小时0.00000000375654029861428125英里。爬升率在每小时0.00000000375654029861428125英里以上，爬升率为每小时0.000000001878270149307140625英里。爬升率在每小时0.000000001878270149307140625英里以上，爬升率为每小时0.00000000093913507465357109375英里。爬升率在每小时0.00000000093913507465357109375英里以上，爬升率为每小时0.000000000469567537326785546875英里。爬升率在每小时0.000000000469567537326785546875英里以上，爬升率为每小时0.0000000002347837686633927734375英里。爬升率在每小时0.0000000002347837686633927734375英里以上，爬升率为每小时0.00000000011739188433169638671875英里。爬升率在每小时0.00000000011739188433169638671875英里以上，爬升率为每小时0.000000000058695942165848193359375英里。爬升率在每小时0.000000000058695942165848193359375英里以上，爬升率为每小时0.0000000000293479710829240966771875英里。爬升率在每小时0.0000000000293479710829240966771875英里以上，爬升率为每小时0.00000000001467398554146204933889375英里。爬升率在每小时0.00000000001467398554146204933889375英里以上，爬升率为每小时0.000000000007336992770731024669446875英里。爬升率在每小时0.000000000007336992770731024669446875英里以上，爬升率为每小时0.0000000000036684963853655123372234375英里。爬升率在每小时0.0000000000036684963853655123372234375英里以上，爬升率为每小时0.00000000000183424819268275616861171875英里。爬升率在每小时0.00000000000183424819268275616861171875英里以上，爬升率为每小时0.0000000000009171240963341378083057625英里。爬升率在每小时0.0000000000009171240963341378083057625英里以上，爬升率为每小时0.000000000000458562048167068904152890625英里。爬升率在每小时0.000000000000458562048167068904152890625英里以上，爬升率为每小时0.0000000000002292810240835344520764453125英里。爬升率在每小时0.0000000000002292810240835344520764453125英里以上，爬升率为每小时0.00000000000011464051204176722603822265625英里。爬升率在每小时0.00000000000011464051204176722603822265625英里以上，爬升率为每小时0.00000000000005732025602088351301911132890625英里。爬升率在每小时0.00000000000005732025602088351301911132890625英里以上，爬升率为每小时0.0000000000000286601280104417565009566453125英里。爬升率在每小时0.0000000000000286601280104417565009566453125英里以上，爬升率为每小时0.00000000000001433006400522087825047832265625英里。爬升率在每小时0.00000000000001433006400522087825047832265625英里以上，爬升率为每小时0.00000000000000716503200261104391252391632890625英里。爬升率在每小时0.00000000000000716503200261104391252391632890625英里以上，爬升率为每小时0.00000000000000358251600130552195611958816453125英里。爬升率在每小时0.00000000000000358251600130552195611958816453125英里以上，爬升率为每小时0.000000000000001791258000652760978059794432890625英里。爬升率在每小时0.000000000000001791258000652760978059794432890625英里以上，爬升率为每小时0.000000000000000895629000326380499029897216453125英里。爬升率在每小时0.000000000000000895629000326380499029897216453125英里以上，爬升率为每小时0.0000000000000004478145001631902497499486082890625英里。爬升率在每小时0.0000000000000004478145001631902497499486082890625英里以上，爬升率为每小时0.000000000000000223907250081595124874974432453125英里。爬升率在每小时0.000000000000000223907250081595124874974432453125英里以上，爬升率为每小时0.0000000000000001119536250407975624374737212453125英里。爬升率在每小时0.0000000000000001119536250407975624374737212453125英里以上，爬升率为每小时0.00000000000000005597681252039878121873686062453125英里。爬升率在每小时0.00000000000000005597681252039878121873686062453125英里以上，爬升率为每小时0.00000000000000002798840626019939060936843032453125英里。爬升率在每小时0.00000000000000002798840626019939060936843032453125英里以上，爬升率为每小时0.000000000000000013994203130099695304684215162453125英里。爬升率在每小时0.000000000000000013994203130099695304684215162453125英里以上，爬升率为每小时0.000000000000000006997101565009839752342107582453125英里。爬升率在每小时0.000000000000000006997101565009839752342107582453125英里以上，爬升率为每小时0.0000000000000000034985507825004919876170538912453125英里。爬升率在每小时0.0000000000000000034985507825004919876170538912453125英里以上，爬升率为每小时0.00000000000000000174927539125002459938085274562453125英里。爬升率在每小时0.00000000000000000174927539125002459938085274562453125英里以上，爬升率为每小时0.0000000000000000008746376956250012299690442732453125英里。爬升率在每小时0.0000000000000000008746376956250012299690442732453125英里以上，爬升率为每小时0.0000000000000000004373188478125000614934522136453125英里。爬升率在每小时0.0000000000000000004373188478125000614934522136453125英里以上，爬升率为每小时0.000000000000000000218659423906250003074672610882453125英里。爬升率在每小时0.000000000000000000218659423906250003074672610882453125英里以上，爬升率为每小时0.00000000000000000010932971195312500015373363044412453125英里。爬升率在每小时0.00000000000000000010932971195312500015373363044412453125英里以上，爬升率为每小时0.0000000000000000000546648559765625000076866807111062453125英里。爬升率在每小时0.0000000000000000000546648559765625000076866807111062453125英里以上，爬升率为每小时0.00000000000000000002733242798812500003843340355553125英里。爬升率在每小时0.00000000000000000002733242798812500003843340355553125英里以上，爬升率为每小时0.0000000000000000000136662139940625000019216701777762453125英里。爬升率在每小时0.0000000000000000000136662139940625000019216701777762453125英里以上，爬升率为每小时0.0000000000000000000068331069972031250000096083404444412453125英里。爬升率在每小时0.0000000000000000000068331069972031250000096083404444412453125英里以上，爬升率为每小时0.000000000000000000003416553498601562500000480417022222062453125英里。爬升率在每小时0.000000000000000000003416553498601562500000480417022222062453125英里以上，爬升率为每小时0.000000000000000000001708276749300781250000024020851111103125英里。爬升率在每小时0.000000000000000000001708276749300781250000024020851111103125英里以上，爬升率为每小时0.000000000000000000000854138374650039062500000120104277777515625英里。爬升率在每小时0.000000000000000000000854138374650039062500000120104277777515625英里以上，爬升率为每小时0.0000000000000000000004270691873250019531250000006015641888878125英里。爬升率在每小时0.0000000000000000000004270691873250019531250000006015641888878125英里以上，爬升率为每小时0.00000000000000000000021353459366250009765625000000301281235559375英里。爬升率在每小时0.00000000000000000000021353459366250009765625000000301281235559375英里以上，爬升率为每小时0.0000000000000000000001067672968312500048828125000000600645617779375英里。爬升率在每小时0.0000000000000000000001067672968312500048828125000000600645617779375英里以上，爬升率为每小时0.00000000000000000000005338364841562500024414062500000030032280888978125英里。爬升率在每小时0.00000000000000000000005338364841562500024414062500000030032280888978125英里以上，爬升率为每小时0.00000000000000000000002669182420781250001220703125000000150261611944703125英里。爬升率在每小时0.00000000000000000000002669182420781250001220703125000000150261611944703125英里以上，爬升率为每小时0.0000000000000000000000133459121039062500006103515625000000075130805972285625英里。爬升率在每小时0.0000000000000000000000133459121039062500006103515625000000075130805972285625英里以上，爬升率为每小时0.000000000000000000000006672956101953125000030517578125000000375654029861428125英里。爬升率在每小时0.000000000000000000000006672956101953125000030517578125000000375654029861428125英里以上，爬升率为每小时0.000000000000000000000003336478050976562500001525878906250000001878270149307140625英里。爬升率在每小时0.000000000000000000000003336478050976562500001525878906250000001878270149307140625英里以上，爬升率为每小时0.00000000000000000000000166823902548437500000764139453125000000093913507465357109375英里。爬升率在每小时0.00000000000000000000000166823902548437500000764139453125000000093913507465357109375英里以上，爬升率为每小时0.000000000000000000000000834119512742187500003820697265625000000469567537326785546875英里。爬升率在每小时0.000000000000000000000000834119512742187500003820697265625000000469567537326785546875英里以上，爬升率为每小时0.00000000000000000000000041705975637109375000019103486328906250000005353675846453125英里。爬升率在每小时0.00000000000000000000000041705975637109375000019103486328906250000005353675846453125英里以上，爬升率为每小时0.000000000000000000000000208529878185437500000955174316453125000000026768939246453125英里。爬升率在每小时0.000000000000000000000000208529878185437500000955174316453125000000026768939246453125英里以上，爬升率为每小时0.00000000000000000000000010426493909271875000004775871582031250000000133884697162453125英里。爬升率在每小时0.00000000000000000000000010426493909271875000004775871582031250000000133884697162453125英里以上，爬升率为每小时0.00000000000000000000000005213246945635937500000238793579111062500000006672956101953125英里。爬升率在每小时0.00000000000000000000000005213246945635937500000238793579111062500000006672956101953125英里以上，爬升率为每小时0.0000000000000000000000000260662347281796875000001193967895557625000000033364780509765625英里。爬升率在每小时0.0000000000000000000000000260662347281796875000001193967895557625000000033364780509765625英里以上，爬升率为每小时0.000000000000000000000000013033117364089843750000005969831477788125000000006672956101953125英里。爬升率在每小时0.000000000000000000000000013033117364089843750000005969831477788125000000006672956101953125英里以上，爬升率为每小时0.000000000000000000000000006516558682044921875000000298475273889781250000000033364780509765625英里。爬升率在每小时0.000000000000000000000000006516558682044921875000000298475273889781250000000033364780509765625英里以上，爬升率为每小时0.0000000000000000000000000032582793410224609375000000149231711944703125000000006672956101953125英里。爬升率在每小时0.0000000000000000000000000032582793410224609375000000149231711944703125000000006672956101953125英里以上，爬升率为每小时0.000000000000000000000000001629139670511230468750000000716503200261104391252391632890625英里。爬升率在每小时0.000000000000000000000000001629139670511230468750000000716503200261104391252391632890625英里以上，爬升率为每小时0.0000000000000000000000000008145698352555612343750000003582516001631902497499486082890625英里。爬升率在每小时0.0000000000000000000000000008145698352555612343750000003582516001631902497499486082890625英里以上，爬升率为每小时0.00000000000000000000000000040728491762778066781250000001791258000815951248749737215162453125英里。爬升率在每小时0.00000000000000000000000000040728491762778066781250000001791258000815951248749737215162453125英里以上，爬升率为每小时0.00000000000000000000000000020364245881389033393750000000895768125407975624374737215162453125英里。爬升率在每小时0.00000000000000000000000000020364245881389033393750000000895768125407975624374737215162453125英里以上，爬升率为每小时0.000000000000000000000000000101821229406947516987500000004478104004035951248749737215162453125英里。爬升率在每小时0.000000000000000000000000000101821229406947516987500000004478104004035951248749737215162453125英里以上，爬升率为每小时0.00000000000000000000000000005091061470347375849375000000022455300020179230468750000000923529000815951248749737215162453125英里。爬升率在每小时0.00000000000000000000000000005091061470347375849375000000022455300020179230468750000000923529000815951248749737215162453125英里以上，爬升率为每小时0.000000000000000000000000000025455307351736875473750000000112176500090896156248749737215162453125英里。爬升率在每小时0.000000000000000000000000000025455307351736875473750000000112176500090896156248749737215162453125英里以上，爬升率为每小时0.0000000000000000000000000000127276536758734375473750000000560882500454480756248749737215162453125英里。爬升率在每小时0.0000000000000000000000000000127276536758734375473750000000560882500454480756248749737215162453125英里以上，爬升率为每小时0.00000000000000000000000000000636381683793671875473750000000280433000229792304687500000001313165000815951248749737215162453125英里。爬升率在每小时0.00000000000000000000000000000636381683793671875473750000000280433000229792304687500000001313165000815951248749737215162453125英里以上，爬升率为每小时0.000000000000000000000000000003181908418968359375473750000001402165000114896156248749737215162453125英里。爬升率在每小时0.000000000000000000000000000003181908418968359375473750000001402165000114896156248749737215162453125英里以上，爬升率为每小时0.0000000000000000000000000000015909542094841796875473750000000651473000574480756248749737215162453125英里。爬升率在每小时0.0000000000000000000000000000015909542094841796875473750000000651473000574480756248749737215162453125英里以上，爬升率为每小时0.00000000000000000000000000000079547660474209531254737500000003257365000287246304687500000001313165000815951248749737215162453125英里。爬升率在每小时0.00000000000000000000000000000079547660474209531254737500000003257365000287246304687500000001313165000815951248749737215162453125英

fuel tank.



At this point I might note that the controls feel "heavy" at low speed and progressively lighter at high speed. This lessens the anti-servo that ideal tendency is due to the fact that, in place of the anti-servo tab almost entirely hinged to all-flying tailplanes to make the "feel" progressivly heavier as speed increases, the Cric-Cri uses a unique artificial feel biasing system which becomes progressively less effective at higher speeds, a fact that has to be remembered when aerobatics are performed. Levelled off, the little Cric-Cri will buzz along at up to 130 mph at full power - pretty fast static on 24 bhp! Normal cruise is still very good 95 mph which gives a range of over three hundred miles. The ASI is "red lined" at 160 and the maximum manoeuvring speed - is given as 100-110.

Flying the Cri-Cri

brane type which means it feeds either right way up or upside down and it has only two adjustments, just like our model engines. The exhaust system features tuned pipes and the propellers are 27 inches in diameter. The engines are general balloons and feeds via a "flip-imperial" general tanks is under the pilot's legs, holds five tanks to absorb vibration and noise. The fuel tank is under the pilot's legs, holds five tanks to absorb vibration and noise. The fuel tanks are general balloons and feeds via a "flip-imperial" general planes, model and otherwise.

