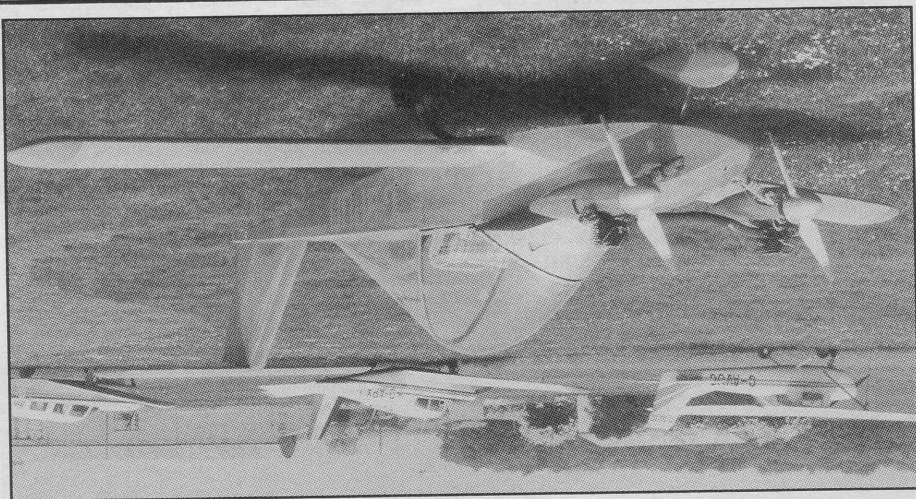


CRI-CRI

Small, aerobatic and twin engined - Peter Russell describes the amazing Cri-Cri.



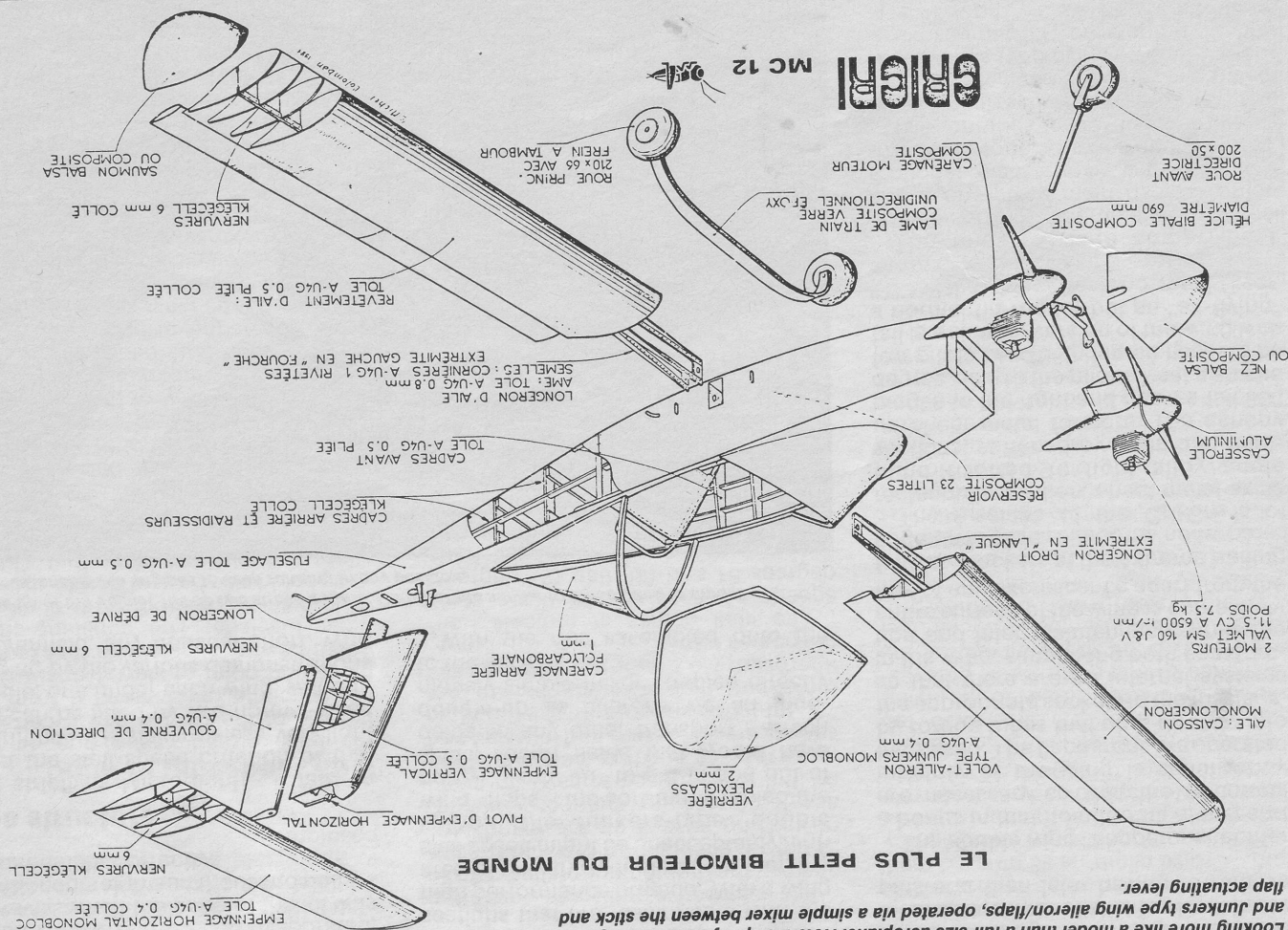
ANY "normal" aerodrome, where more than three aeroplanes in the circuit is often regarded as "congestion", the sight of a twin-engined type flying downwind along the active runway at about twenty feet, *inverted*, would cause an outbreak of apoplexy in the tower, bells ringing and demands that "the pilot to report to Air Traffic".

This particular incident was on the Friday evening before a recent Popular Flying Association International Rally at Cranfield - arguably the biggest concentration of aeroplanes on a single aerodrome, ever seen in Europe, and at the PFA Rally, things are different. In spite of the intensive traffic, little use is made of Cranfield's radio facilities, most movements are strictly "look where you are going", non-radio activities, and though there might be twenty or more aeroplanes in the circuit at any one time, there are remarkably few "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 rigging our tents alongside our aeroplanes - another enjoyable aspect of the PFA weekend - and was heralded by the unmistakable twin engine sound, but revving a

Looking more like a model than a full-size aeroplane, operated via a simple mixer between the stick and flap actuating lever.

LE PLUS PETIT BIMOTEUR DU MONDE



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 Colomban 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 than we had imagined, quite a bit smaller, in fact, than some of the models seen at the Aeromodelleur "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 bungee 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 rivetted 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.

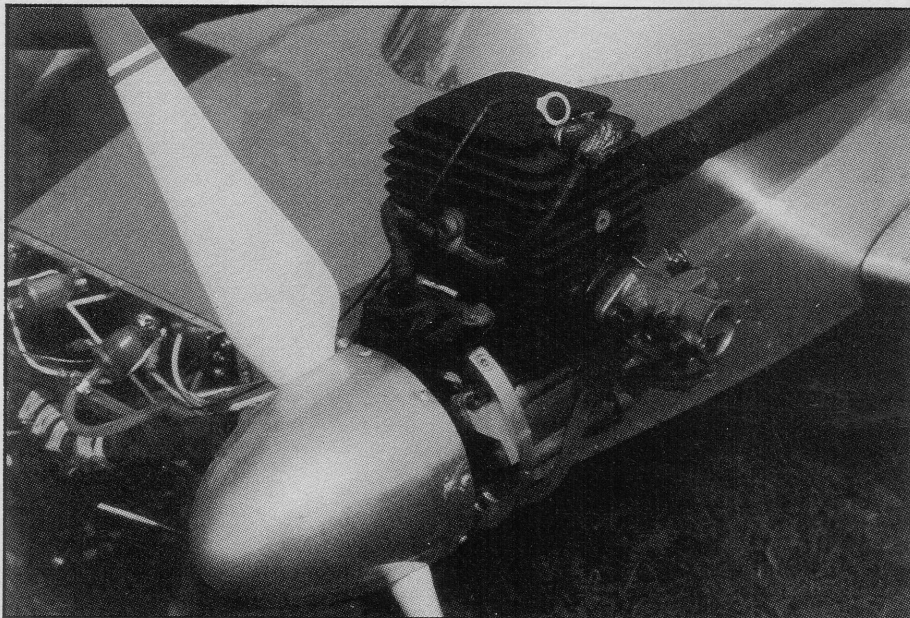
The double wing "flapperons" confer a bonus in that no cut-outs of any sort are necessary so that the structural integrity of the wing is significantly increased. The flapperons are operated by torque tubes that plug directly into the appropriate sockets in the fuselage, so that there are no internal 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 for flap brackets at the extreme trailing edge underside.

The fuselage of the Cri-Cri is of rectangular section, sheet metal skins blind rivetted 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 bungee-sprung, steerable nose wheel and a one-piece main gear of uni-directional 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 hand out. 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 carburettor is of the mem-

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



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

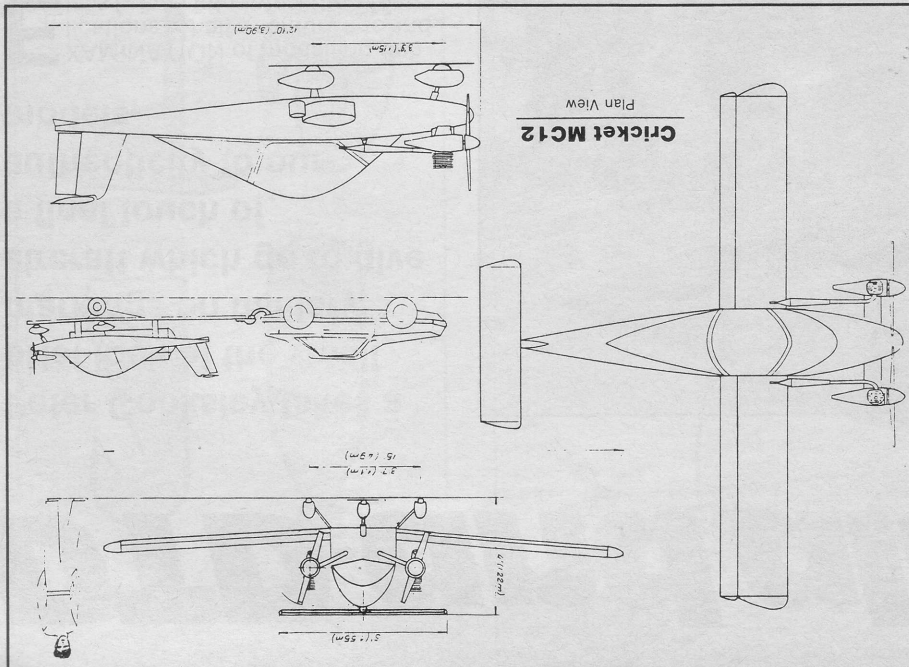
lent characteristics as well as a long becoming very popular and has excel- epoxy "spring" main undercarriage is duplicate of the original. The glass/ least as far as the skin is concerned. might be a bit more enterprising to foam construction could be used, it While conventional balsa or balsa the way, is 4 degrees.

degrees of washout. The dihedral, by good aeroplanes, this one has 1.5 slight complication being that, like all ends could also be very simple, the only wing with its freedom from odds and gular fuselage. The constant chord could be very simple with that rectan- modelling point of view. Construction has much to recommend it from the models of the Cri-Cri and it certainly We have already seen one or two

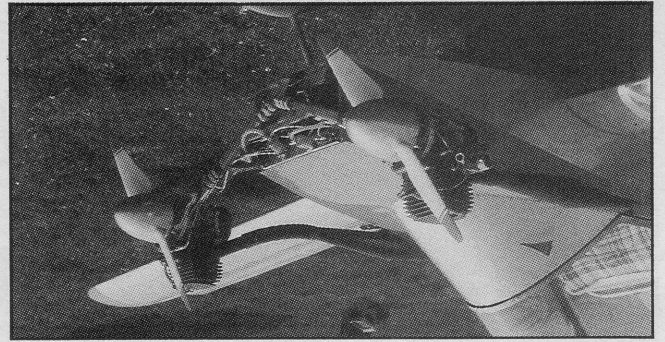
With modelling in mind

position. to appreciate the unusually low seat high with a suggestion that care must be taken not to flare too high, falling Landing is normal, just slightly nose- the ground, regardless of airspeed.

the approach is continued at about 70. Here another idiosyncrasy appears in that "flattest glide" or maximum lift: drag ratio - it's the same thing - occurs with the flaps at 12 degrees. This is unusual in that with virtually every aeroplanes I have come across, any flap reduces the L/D. Perhaps something to do with the unusual flaps. 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 the ground, regardless of airspeed.



This view shows the flexibly mounted welded steel tube engine mounts and the fuel filters. 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".



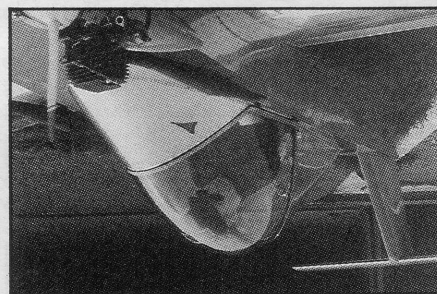
80 before selecting "take-off" flap then The speed should be reduced to about

Getting it down again

complete turn. releasing them will exit in less than one merely centering the controls or even the Cri-Cri spin is quite innocuous, indicated. Rather like a model, again, 45 - all speeds in miles per hour, degrees 51 and full flap (27 degrees) speeds of, flaps up, 56, flaps at 12

The stall comes at indicated air- tail comes into it. approved. No doubt the all-flying "T" 150 for loops and rolls off the top. Stall turns and flick manoeuvres are not again of the "lightening" of the controls For aerobatics, you are reminded

fuel tank. said to be "snug", pilot's feet go to the extreme nose and the backs of his knees rest on the



as 100-110. rough air penetration speed - is given - maximum manoeuvring speed or The ASI is "red lined" at 160 and Vmo

a range of over three hundred miles. cruise is a still very good 95 which gives along at up to 130 m/h at full power

Levelled off, the little Cri-Cri will buzz bered when aerobatics are performed. speeds, a fact that has to be remem- gressively less effective at higher biasing system which becomes pro- Cri-Cri uses a bungee artificial feel sively heavier as speed increases, the tailplanes to make the "feel" progres- almost invariably fitted to all-flying that, in place of the anti-servo tab than-ideal tendency is due to the fact lighter at higher speeds. This less- "heavy" at low speed and progressively comes to light in that the controls At this point one slight idiosyncrasy fpm. "Cruise climb" is 95 m/h.

is 75 and is claimed as high as 1200 mum angle of climb is at 62, max rate dent, averages about 500 feet. Max- depending on wind, surrace and gra- in about ten seconds. The take-off run, to its lift-off speed of around 50 m/h - is selected and the aeroplane gets off check, take-off flap - 12 degrees the engines. After a simple pre-take- ineffective due to the close spacing of and brakes. Asymmetrical throttle is is easy with the steerable nose-wheel warming up at 3 1/2 to 4000 they should means of a pulley-and-cord deal. After by conventional hand "flipping" or by then the engines can be started either until you see the fuel come up the tube by holding your hand over the air intake Just like model engines, you suck-in

Flying the Cri-Cri

planes, model and otherwise. "top" tube just like all aerobatic aero- imperial gallons and feeds via a "flip-tank is under the pilot's legs, holds five to absorb vibration and noise. The fuel welded steel mounts with more bungee material. The engines are mounted on are 27 inches in diameter of composite features tuned pipes and the propellers model engines. The exhaust system only two adjustments, just like our right way up or upside down and it has brane type which means it feeds either