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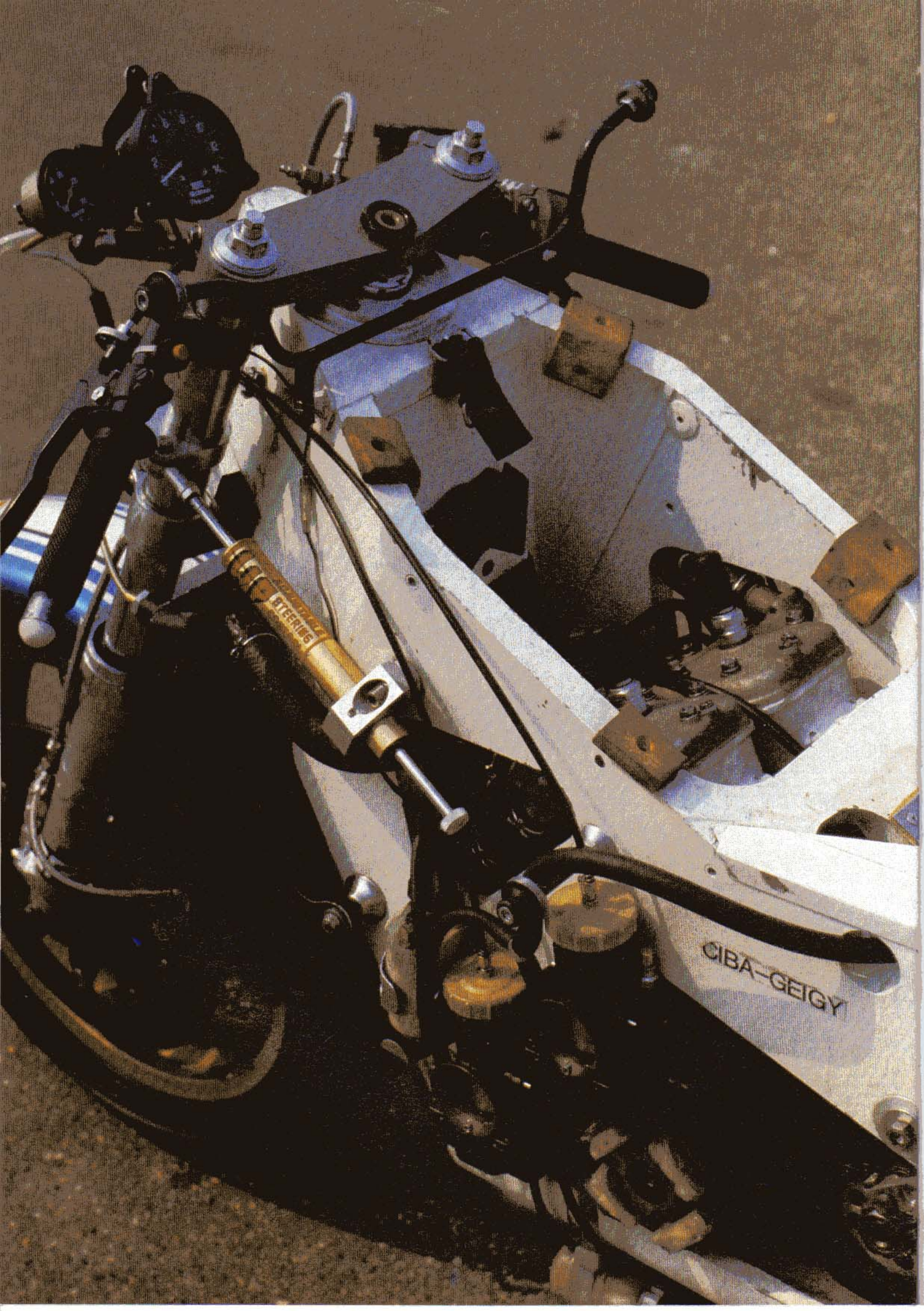

STEERING
CIBA-GEIGY

THE GREAT FRAME ROBBERY

HAND OVER THE ALUMINIUM HONEYCOMB, THIS IS A STICK-UP. ALAN CATHCART RIDES HERON SUZUKI'S COMPETITIVE BRITISH-FRAMED 500 GP RACER WHICH STEALS — WELL BORROWS — ITS TECHNOLOGY FROM F1 CAR RACING

A FASCINATING era in road racing development has recently dawned. On the one hand, a state of acute financial cramp has forced the Japanese factories to cut back on direct involvement in Grand Prix racing, leaving the growth of F1 car-type privately sponsored teams instead. HB-Suzuki, Marlboro-Yamaha and Chevalier-ELF-Honda are products of the escalating costs of modern racing. Even ten years ago it would have been unthinkable that one of the Big Four would have even permitted its name to be linked with that of an outside sponsor. Now it's the norm.

At the same time, the fruits of the horsepower battle have been such that a long-overdue look is being taken at chassis design. From the 75bhp Mike Hailwood needed to win the 1965 500cc world title on the MV Agusta four, we now have almost double that output being achieved by machines like the current works Honda. Inevitably, an impasse has been reached, for today's GP bikes produce far more power than now either chassis development or tyre technology can cope with.

It's not been easy for the Japanese engineers to swallow this bitter pill. When Suzuki tested their latest machines in South Africa prior to the start of the 1983 season, having won the previous two 500cc world championships, Randy Mamola was most disconcerted to find that the new lightweight allow-framed bikes handled so much worse than the '82 version that he was actually lapping slower. More power and a lighter, but flimsier, chassis had resulted in a camel of a bike.

But when Mamola said he preferred to start riding the previous year's machines, he was told in no uncertain manner this just wasn't possible. The Japanese philosophy of 'if it's new, it must be better' didn't permit this kind of pragmatism.

One moral to be drawn from all this is that, in spite of their multi-million yen budgets and a relentless approach to the business of winning races, the Japanese have taken more than 20 years NOT to learn a lesson that has seemed obvious to Europeans for much longer than that: horsepower and light weight win races, but only if the former can be harnessed effectively. In spite of the obvious lessons taught by such ground-breaking designs as the Spanish 250 Ossa and John Player Norton monocoques, the Japanese factories (honourably excepting Kawasaki: remember their innovative KR500?) have continued blindly on their horsepower-obsessed way.

Until now. At last the compass needle has swung back towards Europe, where the technology and materials to further the art of chassis design have traditionally resided. The result has been the recent appearance of a host of high-tech Japanese-powered motorcycles whose European-made cycle parts have broken new ground. ELF of France, now have their own GP bikes under development, equipped with Honda engines, but so far they haven't run in public. Instead, credit for being the first of the new wave in to 500cc GP racing has gone to the British-built Heron Suzuki.

When Suzuki pulled out of GP racing at the end of '83, the remainder of their '82 and '83 GP equipment was split up equally between the Italian Gallina and British Heron teams, whose shotgun marriage had not contributed to the success of a troubled season. With factory development all but halted, both teams found it necessary to build new chassis in Europe in an effort to even things up with Honda and Yamaha. With typical flamboyance, Gallina's plans were leaked some time in advance of the debut of the TGA1 prototype at the French GP in June — by which time the completely unheralded Heron machine, with its mould-breaking tub made from Aeroweb composite material had been sprung on a surprised road racing world.

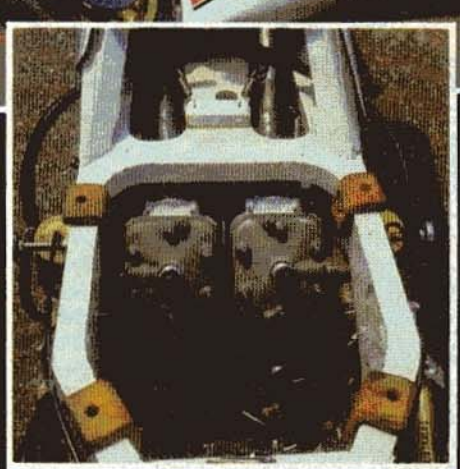
Since then, while the TGA1, ELF2 and other revolutionary machines have yet to make their GP debut, the Heron has not only been tested but also raced by Heron Suzuki's leading British rider, Rob McElnea. In spite of missing two months in mid-season thanks to a broken leg, McEnea finally sat on the bike for the first time in practice at the British GP at Silverstone. The team would have been happy with a single point from the event, but instead they got four, as McElnea raced to a superb seventh place.

A week later in Sweden he improved to an amazing fifth, while in the final GP of the season at Imola, the new Heron proved its worth beyond all possible doubt by taking Rob to sixth place. Three GPs, three high-scoring results, and all done with a two-year-old XR40 engine suffering a considerable horsepower handicap against its works opposition.

A week before the San Marino GP I was privileged to become the first journalist to ride this avant-garde standard bearer. Having ridden McElnea's TT-winning, standard-framed, XR40 Suzuki only a few weeks before, I was effectively able to compare the two directly. Was the Heron a lot different? Does day follow night? Do British twins leak oil?

Designed by former Waddon engineer Nigel Leaper, the Heron is named after the large public company one of whose smaller subsidiaries is the firm which imports Suzuki motorcycles.

Leaper's principal aim was to improve the stiffness-to-weight ratio by the use of modern materials, so he decided to build a tub into which the square-four disc-valve Suzuki engine could be inserted from beneath, with a tray bolted to the underside of the chassis to provide additional rigidity. The whole structure is made from Aeroweb, the brand name for a honeycomb composite material made by the British division of CIBA-Geigy, the huge Swiss conglomerate who have a



patent on it. The material cosists of an aluminium honeycomb sandwich formed by outer skins of almost any material you wish to use.

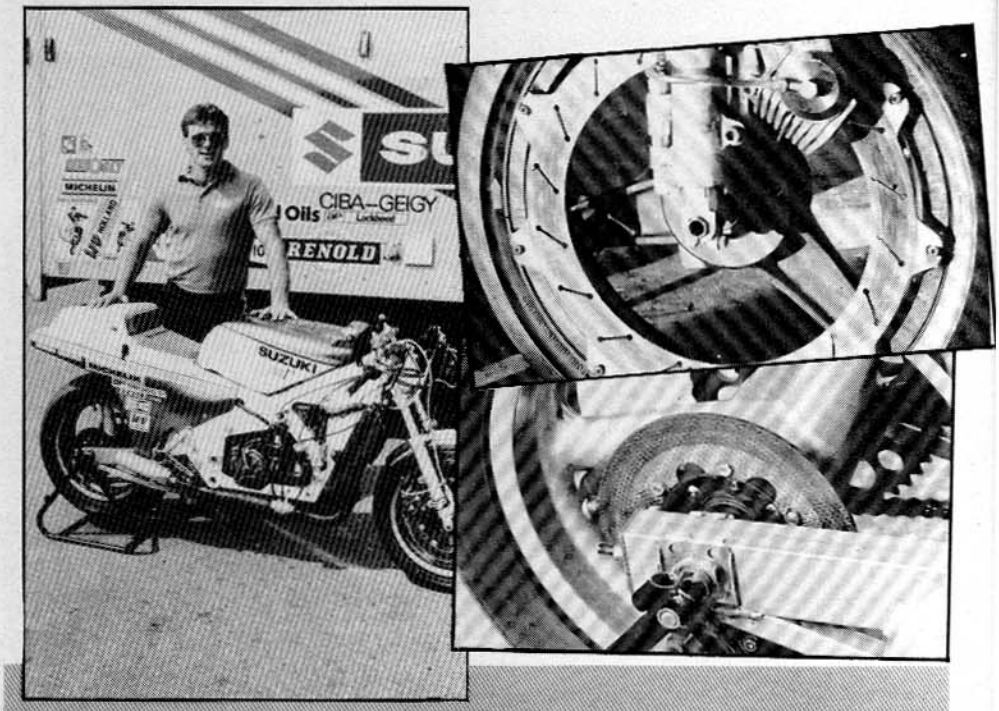
Leaper has used alloy skins on the Heron but the possibility exists of using carbon-fibre or other lightweight material in the future in order to save weight, as is the norm in the F1 car world where Aeroweb has been extensively used for chassis monocoques for some time. CIBA's experience in working with F1 outfits such as Brabham and McLaren proved invaluable in helping Leaper design the Heron: since there are any number of skins and adhesives available, choosing the right one is something you can really only do by experience.

Adhesives? That's right — the Heron chassis doesn't have a single structural weld: the various sections of Aeroweb which comprise it are glued together with special adhesive, with the odd bit of rivetted alloy just to hold the sections in place for 24 hours, which is the length of time it takes to dry. Naturally, this has facilitated altering the bike in the prototype stage, and means accident damage is fairly quickly repairable in the same way. And Aeroweb is very resilient to impact damage — much more so in an accident than, say, an alloy tube frame. Stu Avant has already proved that by falling off it in testing in a very big way. The only legacy of the spill is a slight repair to the rear of the seat member.

The Heron team aren't saying yet how light the bike is, beyond the fact that as yet it's nowhere near the 100kg minimum weight limit for the 500cc class, but from the way the bike accelerated out of a second gear corner like Sear, I'd say that although their main preoccupation was with getting the prototype to handle properly, they've already achieved a useful weight saving as well. With 16in wheels front and rear (the latter a superb new Michelin which gave excellent grip from the experimental compound) weight distribution was excellent, and cracking the throttle hard open only caused the front wheel to come up slightly.

It's the only bike with this kind of performance that I've ever had the nerve to give the big handful treatment to in the middle of the fast Russels Chicane, and the result was electrifying. Instead of shaking its head or trying to twist itself into knots as so many bikes endowed with far less power have done in similar situations, the Heron proved the effectiveness of its chassis concept by simply lifting the front wheel about four inches in the air while I was still cranked hard over to the right on the exit. The first time it happened to me I thought I'd imagined it: next time around I knew I hadn't, but the totally neutral behaviour of the sandwich frame is very deceiving. You feel you can't be going that fast; surely haven't poured that much power through the rear wheel, because the chassis isn't bucking and flexing to let you know it.

One thing I'd say though — when the Heron decides to let go, it probably does so instantly. No little warning signs or hints that you're about to lose adhesion — just BANG! Guess that's the penalty for having such a stiff chassis: makes finding the limit that much harder.



The man himself complete with el poso Men Only *regalia. Insets show the experimental AP Lockheed rim brake that will probably get its race debut next season. It's made of carbon fibre as is the little rear disc in the second picture*

I was able to wind it on like that coming out of the chicane because the bike steers so quickly. Leaper designed the chassis to be multi-adjustable so that although the front end, for example, comes straight off an XR40, the steering head angle can be altered over a range of three degrees (in half degree increments) by means of interchangeable bearing housing units which bolt into the chassis with allen screws. As set up for my test, the Heron had a 24.5 degree head angle — about as steep as I've ever ridden with — very fast steering yet surprisingly not as heavy as I'd have expected. However, the bike was designed for use with Michelin's new radials (using a 17in rear to get the correct geometry due to the lower profile), and since these almost certainly result in heavier steering response, the degree of inbuilt lightness is probably just as well.

Because they hadn't had a chance to go testing with McElnea using radials, the Heron team have been using crossplies for all the GPs, and so that's what I rode on. Pity: wonder what those radials will be like, apart from the big advantage that they wear better and don't go 'off' in a race?

Scratching round the left hander at the end of the Snetterton straight with the brakes hard on, hooking down five gears as you crank over desperately trying to scrub off enough speed to get round the tight right hand hairpin, is a test of any chassis' performance under braking. Once again, the Heron came through with flying colours: the only time there was a twitch was when I applied too much back brake one lap, and another when I was too slow coming off the rear stopper while turning into the corner. My fault, not the frame's.

Heron aren't doing things by halves: as has been the case in F1 car racing for some time they plan to run a full-time development team and rider alongside the McElnea GP equipe, in order to be constantly testing new modifications while sparing Rob the unrelenting task of riding a bike day in, day out in races as well as test sessions. And with solid support from Lockheed as well as Michelin and White Power, who supply the rear unit, the most innovative bike on the current GP scene has already established a lead in the use of new materials and chassis technology, proven by results.

Given that it brakes so well at present, why go to the expense and complication of the carbon rim disc presently being tested, with its problems of maintaining braking temperature and showering dust from the worn surfaces (though the latter has been largely cured by covering the caliper with a lightweight shroud)?

'It's mainly to save unsprung weight,' said Ray Bailey, 'Though a 650 gramme saving doesn't sound much, it makes a big difference when it's unsprung weight. On top of that, the advantage of the rim disc weight-wise is that you only need one caliper (only one disc is fitted), so you save the weight of the second one and all its plumbing. But going to a carbon fibre peripheral disc and pads means we also have the chance to offer a much better brake than the standard system, because we can get more brake torque. Also, a carbon system doesn't fade during the course of a race — it actually improves rather than loses performance. Once we've had the chance to do some testing with Rob now he's fit again, I'm sure we'll be using the set-up in the GPs next season.'

And that's where the Heron is headed. Work is already proceeding apace on a revised version of the chassis incorporating all that the development team have learnt so far. Firm plans for the 1985 season have yet to be drawn up, but it seems certain that Rob McElnea will be attacking all the GPs with two bikes at his disposal, and there's a possibility of a second rider as well if backing is available. ■