



Bontiful!

Keith Bontrager builds special bikes. Take a brief glance at one and you wouldn't know it, though. Where other manufacturers boast oversized tubing, oversized headsets, flashy paint jobs, gimmicky frame designs and all sorts of other widgets and what-nots, Keith's machines are understated almost to the point of being drab.

You can tell Keith likes them that way; he's quietly spoken and relentlessly clear-thinking and logical when it comes to bike engineering and to questioning the 'conventional wisdom' of the bike industry. Our test bike, a *Race OR Rock Shox*, was built up as if it was Keith's own bike, but on a frame to fit me (I'm a bit taller than him), and so provides a further insight into the man's ideas and preferences.

Chassis

The frame is based around a **True Temper** tube set and tips the scales at 4.5lb, not super-light, but well in

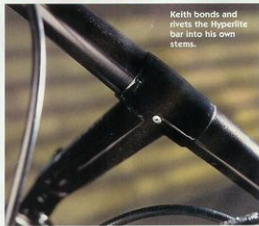
the ball park for a welded steel frame. A lighter version, the *Race Lite OR*, is available for lighter riders, racers and weight fanatics. The *Race OR*, however, is built to last even through the abuse dished out by heavy, strong riders.

The most noticeable manifestations of this 'built to last' philosophy are the gussets which reinforce the frame at the major joints. There are gussets at the head tube - under the top tube and down tube - and the frame is gusseted at the bottom bracket, with reinforcements either side of the seat tube and along the outside of the chain stays. Based on his extensive testing, Keith doesn't believe conventional butted tubing is sufficiently thick at the ends to cope with the heat damage of welding and the stresses of hard core mountain biking, hence the gussets.

The frame bristles with carefully thought-out detailing. The bottom bracket gussets remove the need for a chain stay bridge, so this mud-collector is dispensed with. The top-routed cabling runs through special-

That's the man, but what about the machine?

JOHN STEVENSON gets to grips with Keith Bontrager's own Race OR Rock Shox bike



Keith bonds and rivets the Hyperlite bar into his own stems.

mech roller is on the side of the frame so it doesn't trap mud. The rear wishbone is used to improve braking, but to save weight the bottom of the seat stays are smaller tubes which insert into large, stiff tubes at the top. A fully adjustable anti-chain suck plate under the bottom bracket is effective at keeping the chain from jamming. The frame is coated with tough but not pretty epoxy paint and the decals are large wraparound sheets that serve to protect the frame and can be easily replaced when they get scruffy.

Frame geometry is a fairly standard 74° seat/71° head with a 23in top tube on our size L sample (it's about a 17in frame in conventional numbers). The fork is a specially modified **Rock Shox Mag 21**. **Bontrager** removes the seals and fits a special crown that reduces the fork offset to 1.25in. **Bontrager's Mag 21** is a little more fluid over small bumps than the standard version, but the lack of seals means slightly more frequent maintenance.

Bits

Bontrager bikes start as a frame and fork. You build the bike up yourself, or talk nicely to Global Fridge and have them do it for you. Our bike came with Keith's own idiosyncratic choice of components.

The wheels are 32-hole **Bontrager/Weinmann BCX-1** and **BCX-2** rims (what else?). **Shimano Deore XT** seven-speed hubs with 15 gauge spokes up front and 14 gauge at the back, and a **Dart 2.1in** and a **Smoke Lite 1.9in** tyres.

Bontrager doesn't like eight-speed wheels because he feels that the extra dish makes for an unacceptably weak wheel, and he uses thicker spokes at the rear for the same reason. These conclusions are based on destructive testing of fully



assembled wheels, by the way, not just on theory.

The transmission is pure retro-grouch: **XT** thumbshifters; **Specialized 24/36/46** chainset; **Specialized Hyperglide** cluster; **Sedis SL** chain. The only odd choice is a **105** rear mech, which worked fine until I managed to bend it slightly in a crash. Pedals are **SPDs**.

The braking system is a **Dia-Compe** rig: 987 cantilevers and **SS-7** levers, with prototype **Weinmann** blocks. It works pretty well, though I've been completely unable to stop the front brake from squealing. It's not as good as a **Shimano Servo-wave** system, but a set of **Dia-Compe's** new **Power Control** brake levers should fix that.

Control is through a **Bontrager** bar/stem combo, an **Answer Hyperlite** bar bonded into a **Bontrager** welded chromoly stem, complete with inevitable gusset (Keith **Bontrager**, your Krypton factor challenge is to weld two tubes together without adding a gusset...). This unit has the advantage that a bar that does get crash-trashed can be replaced. Grips are thin but grippy **Bontrager** rubber jobs, good with gloves, too hard without.

Seating is provided by a **Bontrager/San Marco** saddle with titani-

um rails, on an anonymous, black Far Eastern post. I like the **Bontrager** saddle, although I do find that it takes a little getting used to if I have been riding something else for a while.

The bike is scattered with an assortment of **Bontrager's Titec** titanium bolts: bottle bosses, cable clamps, rear mech attachment, lever clamps, but, sensibly, crucial bolts like the brake anchor bolts are steel.

Ride

Enough of this annotated spec list. What's the **Race OR** like on the trail? Well, it's either quick-turning, accurate and responsive or a bit of a handful depending on your experience. We might criticise a \$350 bike that handled like the **Race OR** for being a bit much for a beginner, but this isn't a beginner bike, this is a machine for intermediate to experienced riders who know the basics and want a machine that responds instantly to their every whim.

From that perspective the **Bontrager** is immensely chuckable and when you learn to trust its 'immediate' handling you find it sticks to lines like it's glued to them, descends like it's on rails and climbs as if the rear wheel is getting every ounce of effort you're putting into the transmission and more.

I spent the most fun two hours I've had on a bike this year tearing round Thetford Forest in the dark on this bike. Night riding on single track requires a bike that becomes an extension of your central nervous system, that responds as if it's hard wired into your spinal reflexes, that you can forget about completely and concentrate on the trail, secure in the knowledge that if you need the bike to do something the limiting factor will be your feeble capabilities, not the bike. The **Bontrager Race OR** is just such a bike.

Three independently adjustable steel plates stop the chain from riding up into the gap between the chainrings and the chain stay.

BONTRAGER Race ORS

Weight	24lb
CHASSIS	
Frame	True Temper chromoly 4lb 8oz
Fork	Rock Shox Mag 21
Headset	Kingsbury
Bike size tested	L (nominal 17in)
Standover height	30.25in
Head angle	71 degree
Seat angle	74 degree
Top tube length	23in
Wheelbase	41in
Rear end	16.7in
BB height	11.75in

PRICE £799 (frame and fork)
Global Fridge
☎ 0284 728148

BONTRAGER Race ORS

Superb handling all rounder; great single track bike

Be nice if the frame was slightly lighter (minor niggle)



The Professor

BRANT RICHARDS goes on the trail of tech guru Keith Bontrager, otherwise known as the Professor because of his innovative designs. Pics by STEVE BEHR

Among the usual wacky entertainment and famous faces present at the Malverns Classic this year was a quiet unassuming bloke with a Californian accent hiding out in one of the trade stands. Or at least he seemed quiet and unassuming until he got arrested for driving without insurance and being an alien or something.

Keith Bontrager is renowned throughout the world for his designs: he has the patent on the triple-clamp fork design now being used by most suspension fork manufacturers, he introduced narrow rims to the mountain bike world in the late 1980s, and his steel frames are respected everywhere for their quality and attention to detail.

Keith is referred to by one US bike magazine as the Professor because of the level of design that goes into every bicycle part he makes – and because he is constantly working on improving them. He also has a somewhat boffin-like image – after all, only a Californian

weirdo could be as into gussets as Keith, right?

Great gussets

Such a respected mountain bike guru must have something to say for himself, so we tracked Keith down to find out what's so great about gussets, and just why he is so obsessed with the cult British science fiction series *Red Dwarf*.

Keith has a hell of a lot to say for himself when he gets going.

MBUK: How do British races compare to US ones?

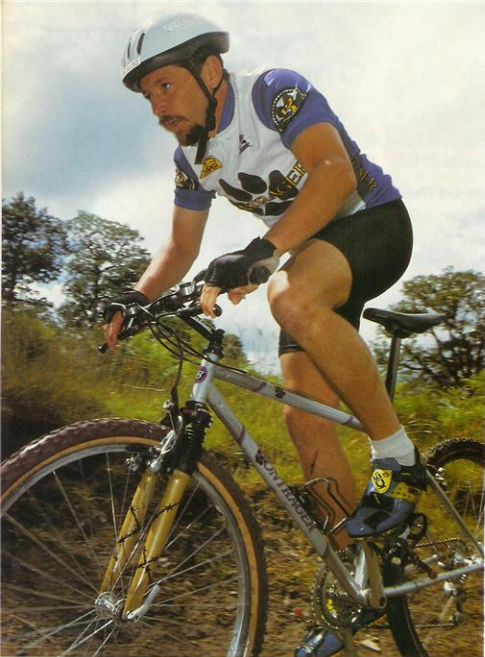
KB: The actual racing is similar. The fast guys are impressive; everyone else seems to have a good time. We don't get the same sort of partying as there is here.

MBUK: Where do you see the future of mountain bike racing and how important is it?

KB: I think the future is promising if the organisers can keep it interesting for the beginners and sports classes. Those riders are the heart of racing organisations everywhere. But I don't think racing is all that vital to



Keith Bontrager has a lot to say on subjects as diverse as MTB design and the TV show *Red Dwarf*.



He does it his way. Keith has some strong views on how mountain bikes should be made. It upsets some people but he doesn't care.

Keith's bikes are distributed in the UK by the awfully nice peeps at Global Fridge (Jez and Sarah Jones). It's a small operation but that's just how they

the existence of mountain bikes, I think bicycles benefit people whenever they are ridden, whether there is a race going on or not.

MBUK: Why are you working with Global Fridge instead of through more established channels?

KB: We sell our bikes successfully in the US without a real marketing effort and through a relatively informal channel. But our stuff is relatively complex - there are lots of features that have to be carefully explained - so everyone benefits if we only work with dealers who can handle this well. Also, our stuff was so expensive over here when we sold through more established channels that many of the riders who would normally be interested were priced out.

We decided that we could reme-

dy most of this by working with Global Fridge. They know the stuff almost better than we do, so the details of the bikes are thoroughly explained and new bike set-up is well attended to. Britain is a relatively small place and the Fridge gets around to races all over the country showing the stuff off. Plus they are cool folks to work with and they put me up in posh hotels.

(Ed's note - Keith slept on the floor of the trade stand at the Malverns without even a ground-sheet between him and the wet British grass)

MBUK: How do you feel when you see someone riding one of your machines?

KB: It's hard to describe but it is a very nice feeling. I am always a little paranoid though. I want to be certain that they are happy, that they reckon they got their money's worth.

Pain barrier

MBUK: When and why did you stop racing motocross?

KB: I raced for about 10 years and stopped in the late '70s. I had a fair amount of success as an amateur, but I never raced as a pro. During that time I suffered several serious injuries (including three broken collarbones and a broken back) and though I was able to compete again after each incident the contemplation of pain eventually deterred me. I stopped racing when I found it difficult to really want to win.

MBUK: Tell us about your Red Dwarf obsession, why is Lister so dear to your heart?

KB: Lister is one of my few remaining heroes. I think Lister has the perfect personality. He lives minute to minute and only worries about the things that are important to him. That's not the way I live but that's the way I'd like to live. And the way



he eats, y'know. Take-away curry – what better could you do?

Crash-proof

MBUK: So just what's the score with these gussets?

KB: Gussets – 2. No gussets – Nil. You don't have enough space here for me to extol all the virtues of proper gussets, as opposed to poor imitations. Basically they make the bike more crash-proof which is essential for most cyclists. They are difficult and time-consuming to use, but no one can make a steel frame that is as light and strong as ours without them. They also allow us to offer the warranty we do since our bikes don't suffer fatigue failures around the joints.

MBUK: When designing bikes do you just want something good to ride yourself, or do you have commercial considerations?

KB: Primarily the former. It has to work well – but it also has to be worth the money. There are many parts of a bike that could be improved with a 'cost is no object' design. The magazines like this stuff so it's tempting to get some exposure this way. But who benefits from a \$400 brake or a \$1,000 crank? I personally couldn't afford this sort of thing. And mountain bikes get thrashed in 'normal use', so the cost of maintenance or replacement is an important consideration.

Frame shapes

MBUK: Have you ever worked with

frame designs other than the diamond shape?

KB: I've never built any but I've done a lot of analysis on them. This is a continuing project that I can't talk about too much, but I understand the ones that I've messed around with and I think that there's a future with some of them. I expect to be doing something with those at some point, unless I get rich and retire to some far-off place and never think about bicycles again!

MBUK: What do you think is the best thing that you've ever made or designed, the thing that is closest to perfection?

KB: I think the stem design we have coming out soon is the closest a steel stem can be to perfection. It's so thoroughly engineered and the manufacturing process is so dialled-in we're getting results that I don't think anyone would have predicted from a steel stem.

We can make steel stems that are lighter than titanium stems and outperform them in every way but cost a quarter as much to produce. Also the next rim design will be significantly better than the current version, although the current design is pretty good despite what Brant said in his test!

Hot projects

MBUK: So what else is new from Bontrager?

KB: Well, we're messing around with a lot of stuff. The current hot projects are seat posts and other titani-



um parts, such as stems and frames.

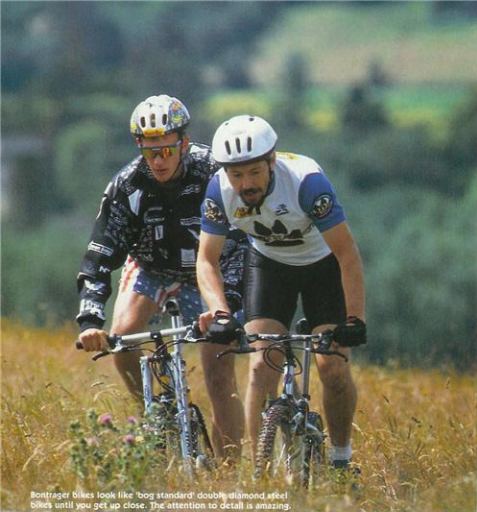
MBUK: If you are so confident about the quality of your steel stems, then what advantages would anybody gain from buying a titanium one – apart from the fact that it says titanium on it?

KB: If we can push titanium as far as

Have gussets will travel. The extra material added at the joints makes all the difference.

Brant gets the low from Mr Bontrager.





Bontrager bikes look like 'bog standard' double diamond steel bikes until you get up close. The attention to detail is amazing.



we have steel then we may be able to get the weight of those stems down slightly below that of the steel ones. The cost will be high though, so to pay the difference you would have to be someone who puts a fairly high premium on weight.

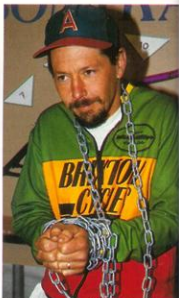
It won't be quite as rigid but our

'We can make steel stems that are lighter than titanium stems and outperform them in every way but cost a quarter as much to produce'

experience so far in riding tests is that this may not be such a bad thing. It'll be easier to maintain in a lot of respects - no paint on it and so on. We think we can make 13cm steel stems that are under 200g, and 13cm titanium stems that are probably 160 or 170g - and these would be stems that in our fatigue tests would be reliable indefinitely - to a quarter million cycles or a crash that no one's likely to have lived through!

The future

MBUK: Where do you see yourself going from here?



The only way to stop Keith making tricky things out of steel is to chain him up!

KB: Back to Santa Cruz where it's warm! I think that right now we're probably going to be doing more of the same. We're not a rich company, we tend to make and design parts slowly and carefully.

Whenever it's possible to bring something out because the design is refined enough and money is available to do it then we'll go ahead. That's one of the major problems - you may have a computer full of good designs but until you can afford to put them into production you end up just sitting on them.

MBUK: What do you think you'll be doing in 10 years time?

KB: Still breathing, I hope. Probably just maintaining fitness and avoiding the grey. I'd like to spend less time

working but, having said that, I can easily be putting in 60 or 70 hours a week right now. I'm putting a little extra into my account so I will be able to retire at an age when I can still move around

on my own, before I end up becoming immobile, crotchety and senile.

Late starter

MBUK: What were you like when you were a child?

KB: I never was very physically fit when I was a kid. Funnily enough, I wasn't allowed to ride a bicycle until I was about 17 years old, and by then I was already racing motorcycles - something I might have been doing at least in part because I'd been so restricted before then. And, basically, I've been on the road to ruin ever since. ○