

WORKSHOP



Jim Kahnweiler photo

Off-Road Test: Fat Tires Come of Age

What? You Haven't Ridden a Lightweight Fat-Tire Bike Yet? Hurry!

John Schubert

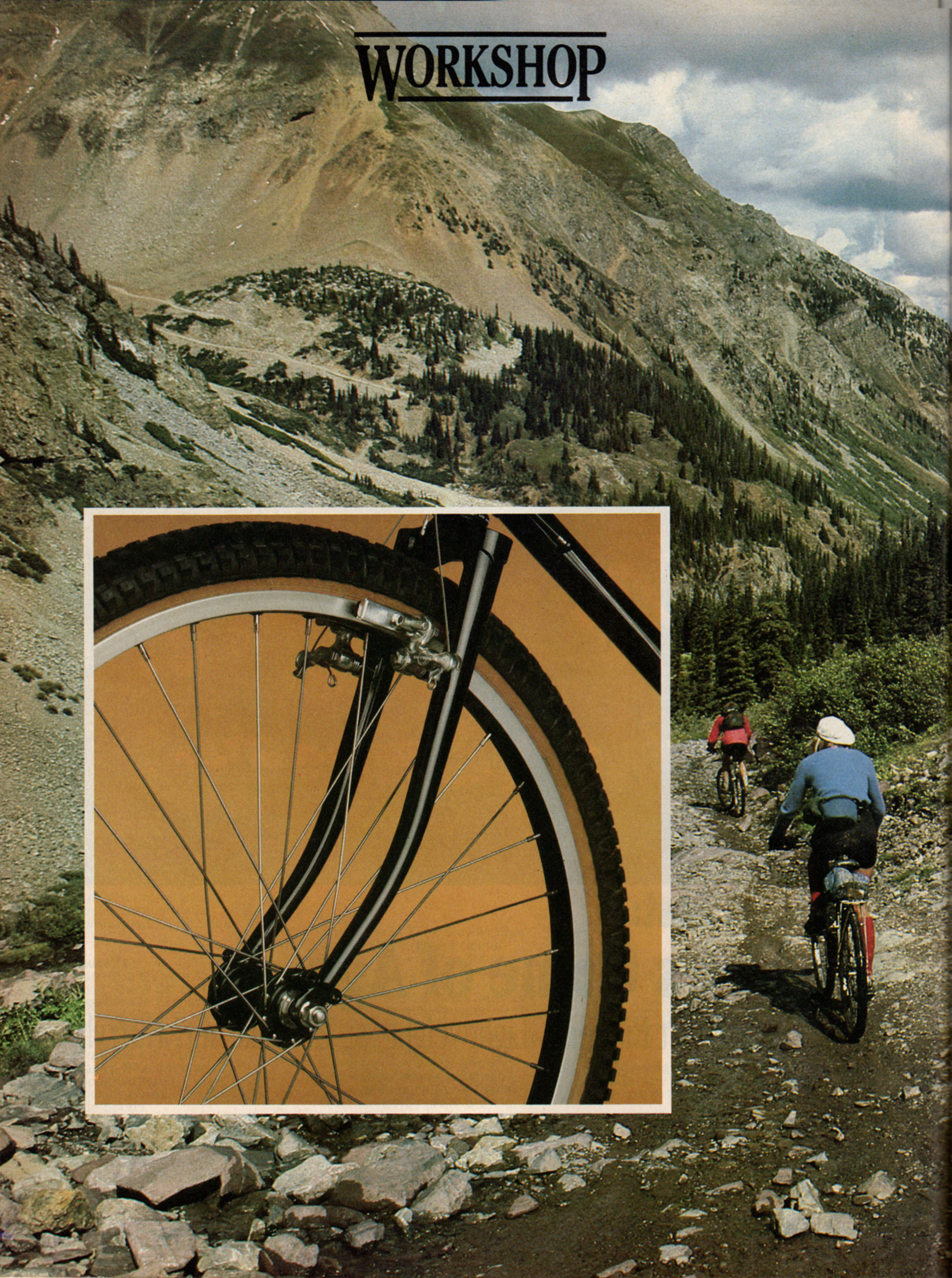
If you haven't yet ridden a lightweight balloon, you won't believe how good it feels. Certainly, it doesn't look as if it should feel good. The bike looks big and heavy, and the fat tires thumb their noses

at everything you ever "learned" about rolling resistance.

Ride one and you'll be scratching your head. The wonderfully secure handling of the rock-solid chrome-moly steel frame

and sure-footed 26 x 2.125 tires is to be expected. But in a 30-pound package, it's unexpectedly lithe. And the fat tires most certainly do thumb their noses at rolling resistance.

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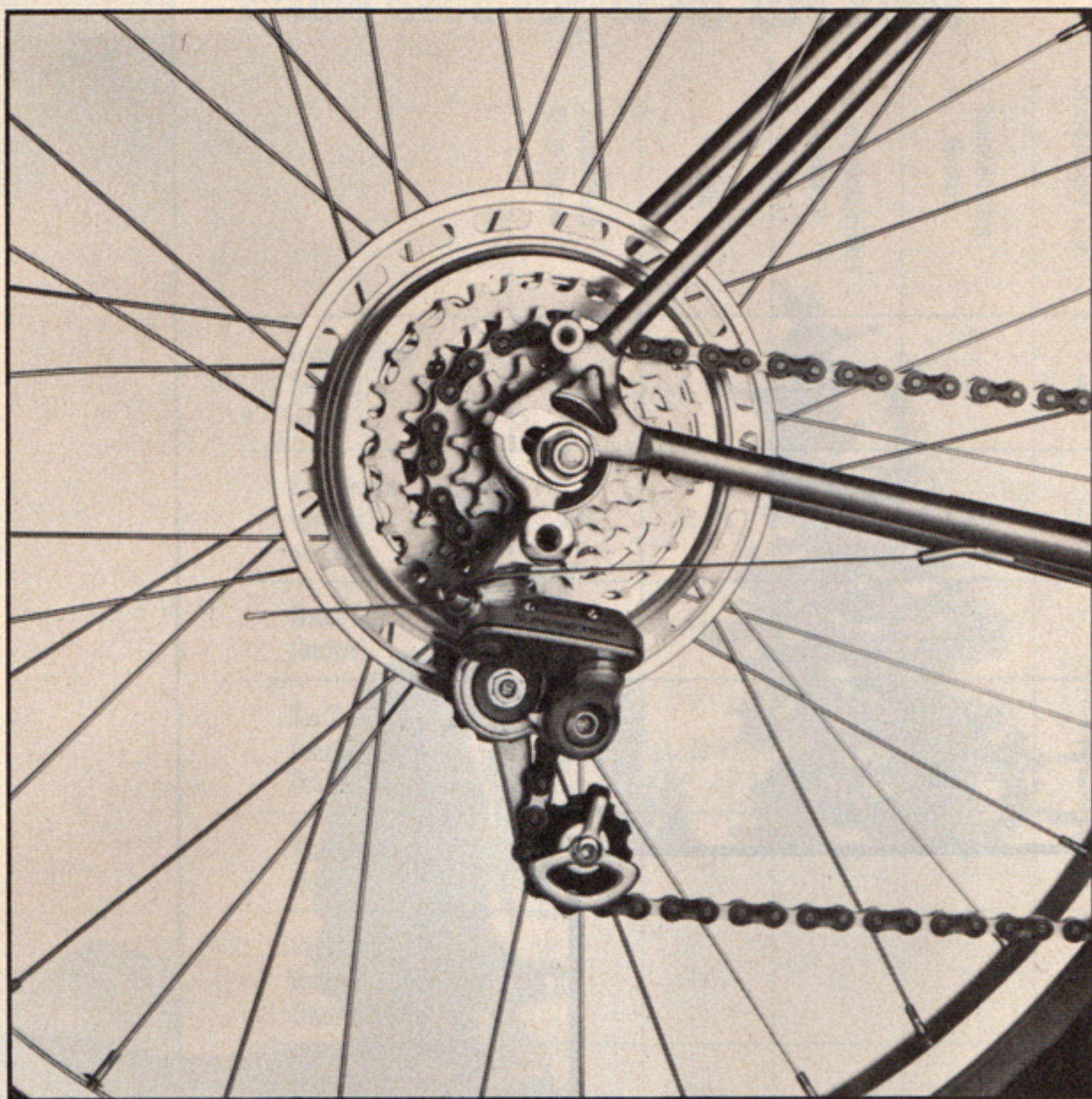




(Above) Flawless brass fillet brazing has always been a trademark of frame-builder Tom Ritchey, who built this MountainBikes Annapurna frame in his California shop. The reinforcing sleeves, sculpted to look like lugs, and the hardwood plug atop the handlebar/stem unit are additional touches. To reuse an old popular saying, "This frame has lugwork in places where other frames don't even have places!" (Left) The Trek 850's front end shows rims and hubs anodized black, to match the paint. Braking surfaces on the rims are left silver, since brake shoes wear the black anodizing off anyway. Note that the Trek, like almost all off-road bikes, uses solid axles and axle nuts instead of quick-release hubs. Solid axles are stronger than hollow quick-releases axles—a factor off-road testers have come to value. *Sally Shenk Ullman photos.*

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Sally Shenk Ullman photos



The Diamondback Ridge Runner's rear end uses the SunTour Superbe Tech rear derailleur. Note the sealed box which replaced the conventional hinged parallelogram, the two sprung pivots (one in the jockey pulley, the other in the derailleur body), and the direct cable routing.

After a few pedal strokes down the road, the little boy (or girl) in you will take over the handlebars—and you'll steer off the pavement, across a field or down a rock-strewn dirt road. You'll feel relaxed, confident, and in complete control.

A Mere Sales Pitch?

This may sound like a sales pitch, rather than *Bicycling's* usual honest reporting, but it's absolutely true. More times than I can count, I've seen skeptics ride lightweight fat-tire bikes around the block and return with ear-to-ear grins. Major luminaries from the world of skinny-tire bicycle companies have called me to report how delighted they are to have discovered fat tires. As *Bicycling's* technical illustrator, George Retseck, succinctly put it, "This is a fun bike. Anybody want to buy my Raleigh Pro?"

And now the lightweight balloon is coming of age. The bike that was first invented in 1976, first marketed to the public by a few custom framebuilders in 1979, and first sold in any notable quan-

tity last year, is now a mainstream product.

Every major manufacturer in the U.S. and Japan has recognized the appeal of the "all terrain bike," "klunker," "wilderness touring bike," "lightweight fat-tire bike," or whatever the industry will eventually choose to call it.¹ Even the purist European manufacturers are looking into lightweight fat tires. The bike that is so easy to learn on and relaxing for a newcomer to ride (two attributes a road racing bike doesn't have) is poised to make major inroads into the mainstream market.

When we last tested off-road bikes 11 months ago ("The Klunkers of Marin," June 1982), only two of our test bikes were made in mass production factories. In our current test, the tables are turned: only one test bike is handbuilt.

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¹Indeed, there is no general agreement on a generic name for these bikes. People I've talked with rule out "klunker" because it sounds undignified, "cruiser" because it refers to limited-purpose beach cruisers, "off-road bike" because they're quite usable on the road, and "MountainBike" because it's a trademark.

Organized Off-Road Touring

"The hottest thing to hit the outdoor travel market since cross-country skiing" is how Howard Potter of Adirondack Wilderness Tours describes the advent of organized off-road bicycle touring. Adirondack Wilderness Tours is one of several companies that have already begun offering organized tours, complete with rental of high-quality 15-speed off-road bicycles.

These group tours enable cyclists with little navigational expertise to complete multi-day backcountry tours. Since trails aren't as well-marked as streets, this can be an important advantage. Depending on the individual tour, amenities such as sagwagon service and alternating hotel lodging and camping may be offered.

Many such companies are sure to appear in the coming months. Watch *Bicycling's* classified ads for details. In the meantime, here are four that we already know of:

Adirondack Wilderness Tours (Cargo Lake, NY 12032) offers weekend, mid-week, and week-long tours, with Puch and Ross rental bikes. Some of their tours will be directed toward younger (teen-age) participants; others will be for all ages. Some tours will offer a combination of off-road bicycling, canoeing, and backpacking, all during the same expedition.

Rough Stuff Touring (Box 265, Port Townsend, WA 98368) is led by *Bicycling* contributor Bonnie Wong. Specialized StumpJumper bicycles are provided for the two-to-ten-day tours in Western areas such as Baja California and Canyonlands National Park.

Wilderness Bicycle Tours (Box 692, Topanga, CA 90290) offers day trips, weekend, week-long and longer trips in southern California's eastern Sierra range, desert regions, and Catalina Island. Director Casey Patterson promises camping in remote, primitive areas (with occasional stops at campgrounds and motels), and offers rental bikes.

Bicycle Detours of the Great Southwest (535 Cordova Road, Suite 463, Santa Fe, NM 87501) takes you through Indian and "old West" monuments, offers whitewater rafting and rides on steam-powered trains, and includes informal lectures on local culture. Trips are one and two weeks long.○

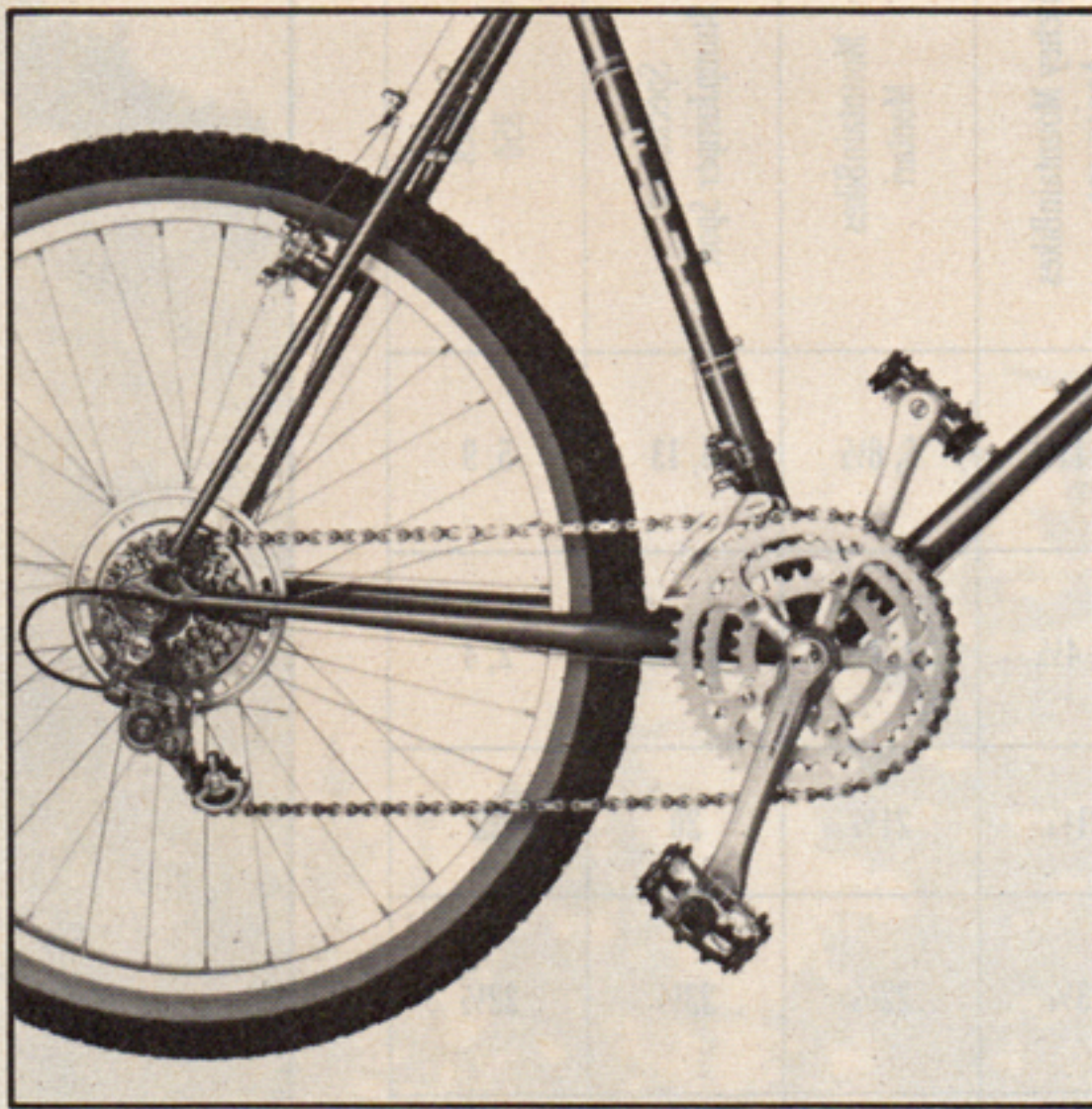


The StumpJumper Sport displays some of the new tooling that has gone into off-road bikes: new tubesets include oversized top tubes, down tubes, and fork blades, which necessitates lugs and fork crowns to match. TIG-welded handlebars, cantilever brake bosses, and a host of new components make these bikes the most original we've seen in decades.

Frame Geometry of Fat-Tire Bikes

	Diamondback Ridge Runner	Mt. Fuji	Ritchey MountainBikes Annapurna	MountainBikes Montari	Specialized Stumpjumper Sport	Trek 850
Frame Weight (pounds, ounces)	6, 2½	6, 6½	5, 11½	5, 6½	6, 13	5, 9
Fork Weight (pounds, ounces)	2, 9	2, 5½	2, 4½	2, 4½	2, 9½	2, 4
Frame Size (inches)	19½	22	21¾	21½	20	22
Top Tube Length (inches)	23½	23⅝	23¼	22⅞	23⅝	22½
Wheelbase (inches)	44	44	43	43	45⅝	42¼
Chainstay length (inches)	18½	18¾	18	18	18¾	19
Front Center (inches)	25½	25⅝	25	25½	26⅝	23⅝
Head Tube Angle (degrees)	70	68½	69	69	67	71
Seat Tube Angle (degrees)	70	70	70	70	69½	70
Bottom Bracket Height (inches)	12⅜	12	11¾	11¾	11¾	11
Fork Rake (inches)	2¼	2	2	2	3	1¾
Trail (inches)	2½	1⅝	3	3	2⅜	2¾

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The Mt. Fuji displays a typical off-road drivetrain: SunTour MounTech derailleurs, Sugino AT triple crankset, and SunTour "bear trap" pedals. Note that the frame has bosses for two water bottles, rear rack, cantilever brakes, and fenders.

Continued from page 111

But don't infer from this that handbuilt, custom ballooners are passé. On the contrary, U.S. custom builders are producing an ever-widening variety of beautiful machines in the \$700-to-\$2000+ price range. We've seen enough that we could fill the magazine with them. Since we can't do that, we're using one—the Ritchey MountainBikes Annapurna—to serve as an example of how the finest off-road bikes are made.

No Compromise

Meanwhile, we concentrated on the new wave of affordable bikes that are factory-built. Out of dozens of attractive brands and models, we arbitrarily picked five. The five range in price from \$475 to \$610; four are made in Japan and one in the U.S.

These bikes show that the industry norm in 1983 is impressively good. No manufacturer wants his bike to be labeled "a turkey in the dirt," and all have carefully studied the U.S. handbuilt mod-

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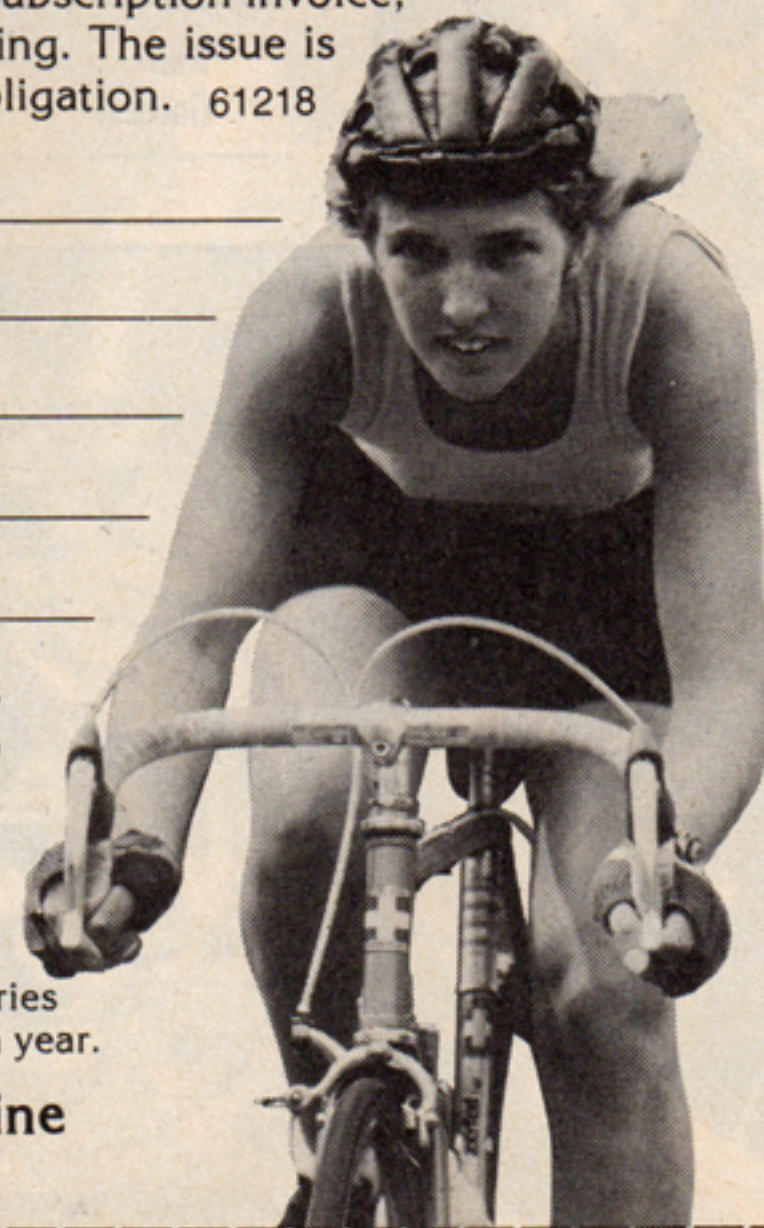
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els before coming up with their own designs. I only wish that skinny-tire bikes were all so well thought out.

The test bikes do differ from one another, but the design differences are subtle, and they're all within the limits of high-performance. The cost-cutting compromises that make these bikes hundreds less than their handbuilt brethren are mostly niceties of appearance. Every one of the bikes has all the off-road high performance features from the following list:

1) Wheels: The single most important element that makes fat-tire cycling fun is the aluminum ballooner rim and the lightweight skinwall ballooner tire. Together, these components shed three pounds per wheel when compared with yesteryear's steel ballooner rims and blackwall tires.

2) Frames: Different builders are using slightly different frame geometry, but all have one thing in common: long wheelbases and slack frame angles. While most skinny-tire bikes fall between 40 and 41 inches in wheelbase, ballooners range between 42 and 46 inches—and 42 is considered quite short. Head and seat angles are usually 68 to 70 degrees, compared with the road bike's 72 to 74 degrees. Chainstays and top tubes are long (18-plus inches, 23-plus inches) to add wheelbase and keep the rider's weight between the wheels, even on the steepest hills. Bottom brackets are about 12 inches high, giving around 1¼ inches more ground clearance than road bikes have.

The long top tube, slack head angle, and ample fork rake add up to a long front center measurement (distance from chainstay to front axle)—usually 25 inches or more, around two or three inches more than a road bike will have. By putting the front wheel that much farther in front, you get a bike that feels more secure and controllable on steep descents.

I'm pleased to see that the industry has adopted oversized tubing as a standard for fat-tire bikes. Oversized tubing² is more rigid and stronger, so it buttresses the frame against the stresses of rocky road

²Ballooner frames use 1⅝-inch top tubes instead of the road bike standard one-inch top tubes. Down tubes are 1¼ inch instead of 1⅝ inch. Chainstays, seatstays, and fork blades are correspondingly bigger, with the exact dimensions varying from manufacturer to manufacturer. Seat tubes remain the same as road bike seat tubes at 1⅝ inch, mostly because no component manufacturer has started to build seatposts for oversized seat tubes.

riding and chance encounters with trees; moreover, the increased rigidity gives a wonderfully secure and controllable road feel. True, there's a weight penalty—but it's a trivial pound or two. Remember, the entire bike still weighs only 29 to 32 pounds!

It would have been quite tempting for factories to abandon oversized tubing in

the rush to manufacture fat-tire bikes. Oversized tubing requires much expensive new tooling. But the factories opted for the benefits of the beefier tubing, and tubing and lug manufacturers cooperated by tooling up the necessary frame components. Thanks, folks!

Double-buttressed oversized tubing is now

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First in a series on touring equipment

HANDLEBAR PACKS



by
Shaun Jackson
and
Leslie Bohm,
founders of
Eclipse

Stability—The Shocking Truth

A handlebar pack's most important feature is its suspension system. For safety and to protect its contents, the pack must ride in a secure and predictable manner.



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Pockets— “Handy as pockets on pants”

Trousers have immortalized pockets. But pockets, in pants or packs, are only handy if they're really usable. They must be easy to reach and easy to get into.

Because handlebar packs carry frequently used items, pockets and zippers must be



accessible with one hand from the rider's position. Zipper openings should have two sliders for convenience and wrap around three sides for complete access to interior space.



Mapcase— More than 2 sides to this story.

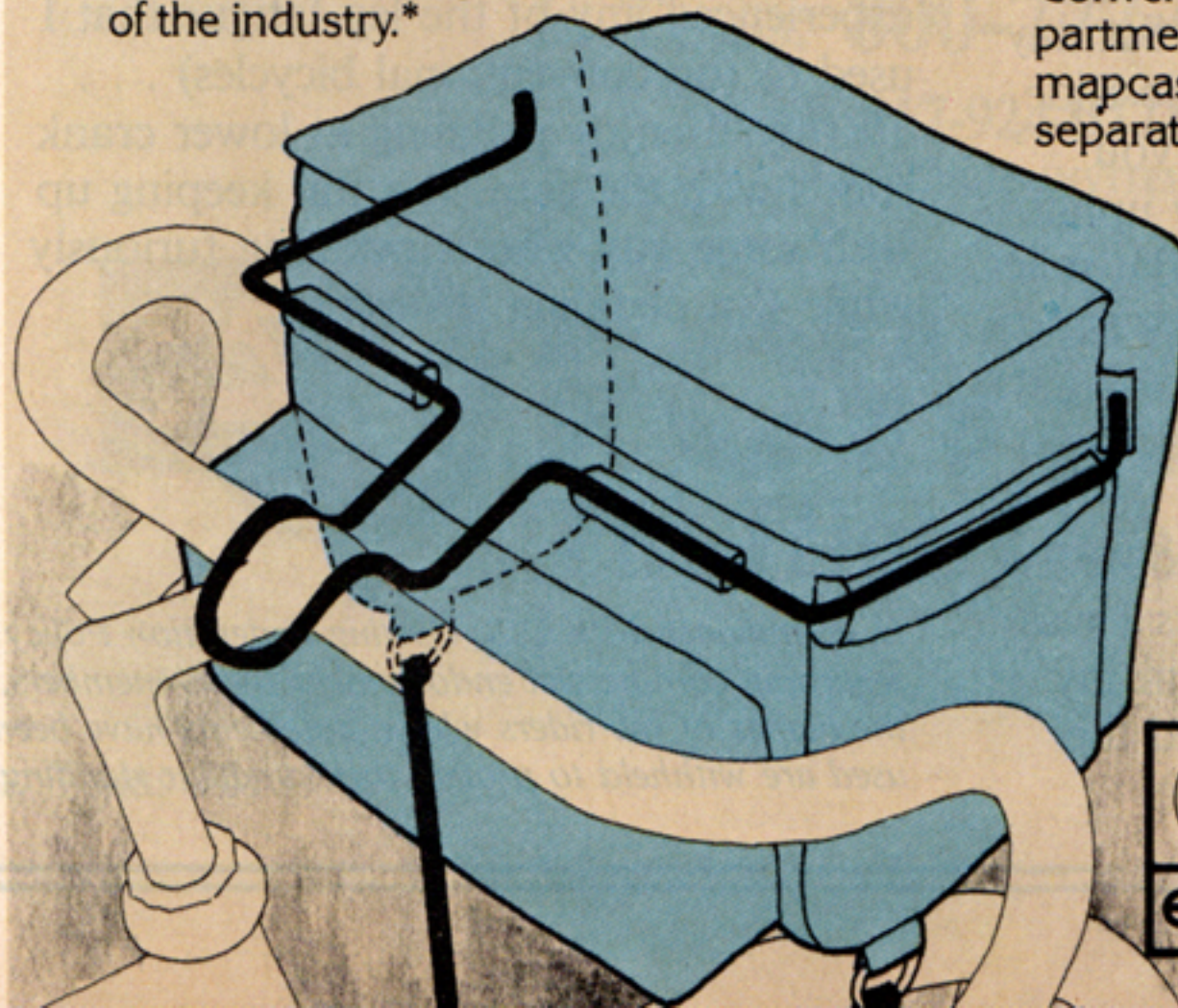
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*U.S. Patent No. 4066196,
and U.S. Patent No. 3955728.



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Picking the Right Frame Size on an Off-Road Bike

Erik Koski

The rules of thumb people use to select the proper frame size for their road bikes frequently result in the selection of

a frame that is slightly bigger (and hence heavier, less rigid, and less maneuverable) than necessary. For off-road bikes, the same rules don't apply at all—and if they're followed, the cyclist will have a frame far too large to deliver optimum handling and rider confidence. Here's why:

When the bike is to be used primarily on rough and uneven terrain with steep downhills, it increases the rider's control and confidence to have a greater amount of crotch-to-top tube clearance than on a road bike. This allows the saddle to be dropped lower for steep descents. The lowered saddle, in turn, enables the rider to lower his or her center of gravity. More importantly, it allows the rider to control weight distribution, putting more body weight over the rear wheel to provide better rear wheel traction during braking. This weight shift downward and rearward enables the rider to stay in control and keep from going over the handlebars on steep descents.

Other benefits of the smaller frame size are being able to use body English more efficiently, and the ability to put a foot down on uneven terrain.

With a smaller frame size as a given, the upright riding position provided by the off-road bike's handlebars helps to maintain a comfortable seat/handlebar relationship. (So does the combination of small frame size and long top tube that most designers of off-road bikes employ.) An optional, extra-long seatpost (10 to 12 inches or 250 to 305 millimeters) may be required along with the smaller frame sizes. (Remember, you need a minimum of 2½ inches of seatpost inside the frame.)

The common bottom bracket height for off-road bikes is 12 inches, compared to 10½ to 10¾ inches for road bikes—thus the top tube height (and straddle clearance) for a mountain bike is approximately 1½ inches higher when compared to a road bike of equivalent frame size. Since an off-road bike fitted for rough riding should give 2½ to 3 inches of crotch clearance, compared with 1 to 1½ inches on a road bike, you usually want an off-road bike with a frame about three inches smaller than your road bike.

Confirm proper fit by straddling the bike with the shoes you will cycle in (lug-sole running shoes or lightweight hiking boots are best), and pick the bike off the ground. Have a friend measure the clearance between the tires and the ground.

If the bike is not going to be used for rough riding, but rather for smooth dirt roads and pavement, you can fit it as you would a road bike. This will bring the handlebars higher—a benefit for some people, a detriment for others—and, depending on the brand of bike you select, it will lengthen the top tube.○

Erik Koski is the designer of the custom hand-built Trailmaster bike that we reviewed in June 1982. His Cove Bike Shop (1 Blackfield Dr., Tiburon, CA 94920) is one place that does stock extra-long seatposts.

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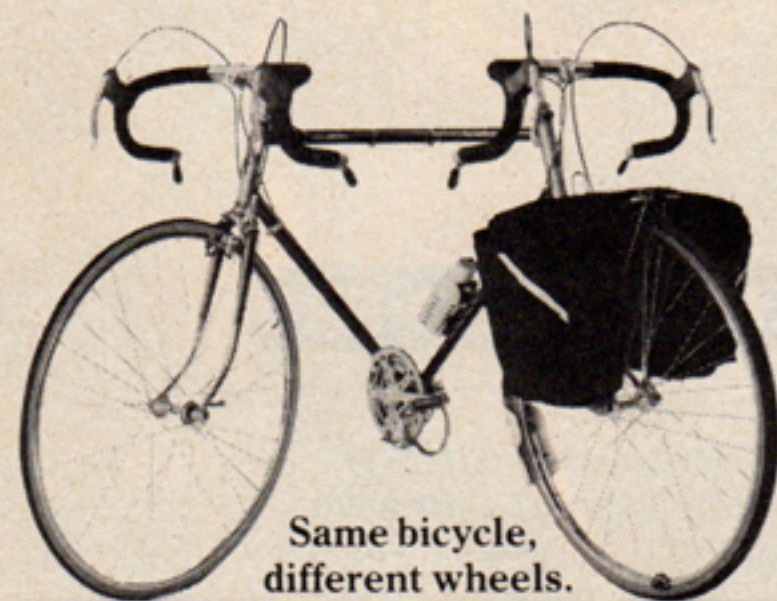
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Continued from page 115

appearing on some makers' fat-tire bikes—a sign of a very heavy investment in tooling by tubing companies. (The mandrels used to make double-butt tubing are incredibly expensive.) All truly Beautiful People will want to have double-butt fat-tire bikes for reasons of aesthetic pleasure and pride of ownership. But the truth is, I can't feel any difference on the road. Double-butt or straight gauge, a fat-tire frame is so rigid (and the tires are so shock absorbing) that the only advantages I can imagine are a teeny-weeny weight saving and a bit more crashworthiness.

3) Drivetrain: Steep uphill demand stump-pulling, sub-one-to-one gear ratios. Fast downhill or paceline riding

on smooth pavement demand reasonably high gears, between 85 and 90 inches. The 100-inch top gear which is ubiquitous yet useless on road bikes is even more useless here.

All of our test bikes meet these needs with triple-chainwheel wide-range gearing; low gears are what they need to be and high gears are appropriate. Some off-road riding experts prefer single and double chainwheels with wide-range free-wheels; I'm slightly gimmick-oriented, so I prefer the triple chainwheels myself.

France's T.A. had a monopoly on the off-road crankset market until Sugino began offering its Aero Tour Triple in the longer (175 to 185-millimeter) lengths favored by off-road riders for better lever-

Continued on page 127

New Arena for Ballooners: Cross-Country Ski Trails

Bruce Leaf

Cycling on cross-country ski trails? That is exactly what Devil's Thumb Ranch in Fraser, Colorado, is hoping to do this summer, and perhaps the idea will be catching.

Most ski areas hibernate during summer and fall, waiting for snow before coming to life. To get themselves through the summer doldrums, Winter Park and Breckenridge have installed "super slides" on their slopes to supplement their off-season revenues. Telluride has its jazz and rock festivals, Aspen its classical music institute, and Vail its celebrity golf classic—all to boost the local economy. Now Devil's Thumb Ranch is saying thumbs up to mountain bike riding.

"We'd like to make more use of our trails," says John Fisher, general manager at Devil's Thumb. "Runners have trained here during the summer for several years and have benefited from the relaxed atmosphere and the high alti-

tude. I don't see why bike riders couldn't do the same thing."

Located in an isolated valley at 8,500 feet in the Rockies, Devil's Thumb boasts over 60 kilometers of maintained trails on 815 acres of private property. The Arapahoe National Forest borders one side, and the Continental Divide forms the eastern skyline. A lightly trafficked dirt road, a former railroad grade, is visible from the ranch as it winds through the forest toward 11,670-foot high Rollins Pass.

To kick off the mountain riding idea, last October Fisher joined forces with Rol Hoverstock, owner of The Spoke in Boulder, and organized a mountain bike stage race. The event was to be run in cool autumn weather, but winter arrived instead with subfreezing temperatures and eight inches of snow.

But the race was still on. A small but hardy field of 15 showed up, lured perhaps by the first prize, a Specialized StumpJumper Sport. Ironically, the race winner, Kent Erikson of Steamboat Springs, Colorado, manufactures his own brand of mountain bike, Moots Mountaineering. But nobody heard him complaining.

This year's race is tentatively scheduled for late August or early September to avoid the snow.

Meanwhile there is plenty of time for mountain bikers to take to the ski trails . . . and to have a devil of a good time. Other ballooners might inquire about trail use at ski touring centers in their own areas.○

The Good Word on Tires

Fat's Where It's At

Roger Durham

After years of almost constant cycling, including many long, hard rides, I was sick and tired of being bounced like a rubber ball over every pothole, welt, and section of rough pavement. My numb hands, shocked elbows, and shoulders all told me they were tired, too, of being vibrated like a tuning fork at each bad bump.

I remembered back to the 26 × 1.75-inch tires I had used as a boy. Flats were almost nonexistent. Spoke trouble and rim trouble were never even considered, and the wheels could jump curbs with a full load of papers. Those tires were soft riding and pleasant. Maybe they were inefficient, but we didn't know it.

But how inefficient had they really been? I decided to test a set of the Schwinn Spitfires on my ten-speed. The conversion involved only making a couple of brackets to lower the brakes and altering the lower stays to clear the tires.

What a difference! Much of the shock was gone, including the terrible jangling of the frame when I used to hit a bump. Gone was the frightening shaking when going downhill fast on rough pavement. Gone was the almost arthritic pain in my wrists and elbows.

But a bicycle which doesn't coast properly robs a person of his energy uphill or downhill, whenever he's moving. I knew if the 1.75-inch tires weren't going to coast efficiently, then they wouldn't be very useful.

I decided to test the tires in Burbank, where there's a mile-long downhill which, in addition to having a left-hand turn that is exciting if you don't brake, ends in a slight rise just before dropping down again. A person can barely coast over it—maybe two out of five times—on Le Tours pumped up to the hardness of a baseball, if he dare the left-hander that often.

Much to my pleasure, I found I could coast over the rise just as often, if not more so. I could even do it without scaring myself on the left turn, and without inflating the tires beyond the recom-

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mended pressure. The Spitfires seem to stick to the pavement better than the Le Tours, too, and I found myself taking turns faster than before—for better or for worse.

Looking back to my days of skinny tires, I now wonder whether the feeling of jumping and vibrating on my ten-speed was really efficient.

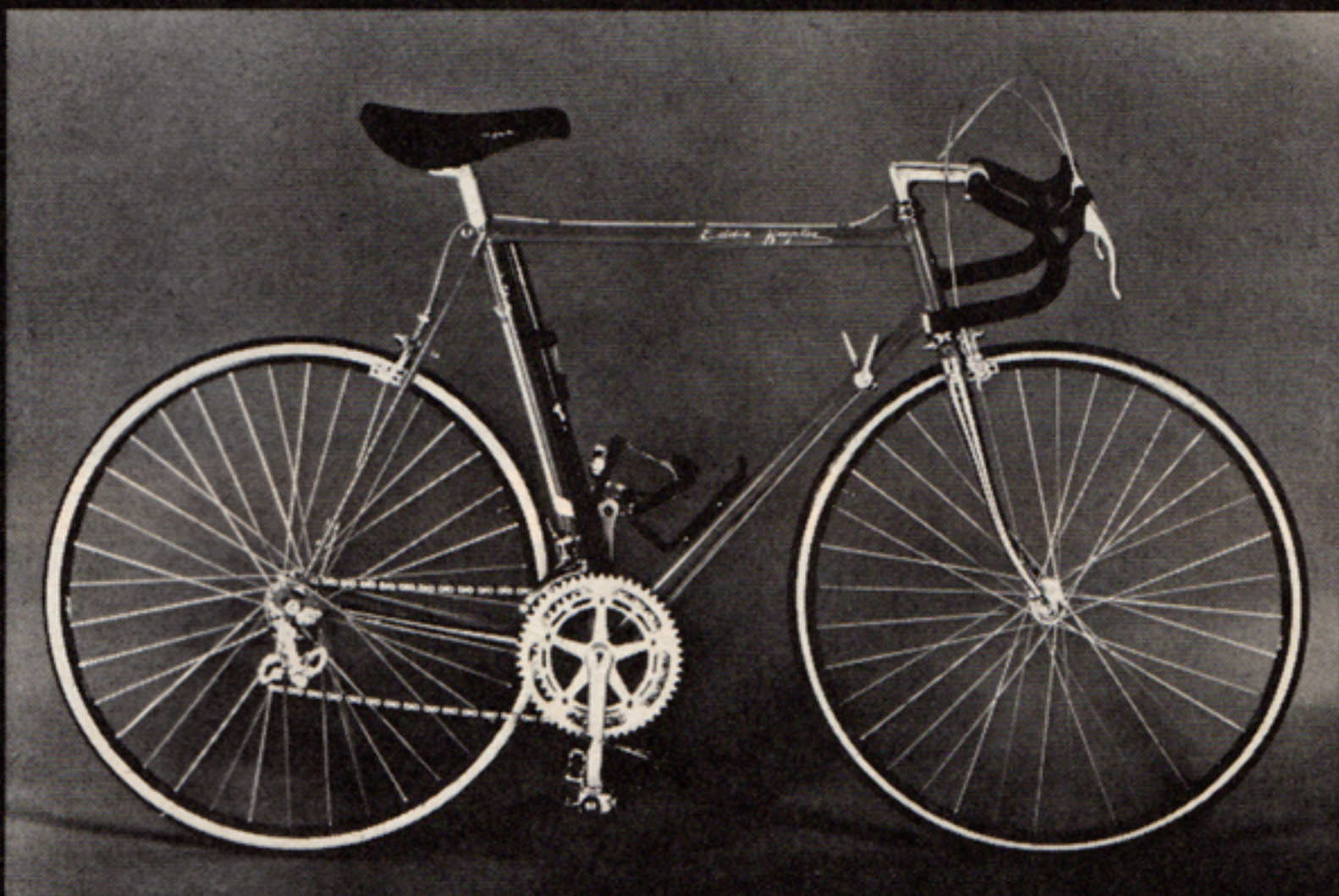
Because wide tires are sturdy, in two years I've replaced only two. They have

fewer cuts or punctures, too, and I've had only three flats. No spokes have broken. No tools are needed to take off a tire.

The Schwinn Spitfires really aren't dirt tires and don't perform like them, but the bike is still fun on dirt roads and fire trails. Of course, on dirt it handles far better than the 27-inch tires.

The nicest part about the 26 × 1.75 tires is that I once again like cycling. Most of my aches are gone. And I don't think I'll ever go back to the high-pressure clinchers again.○

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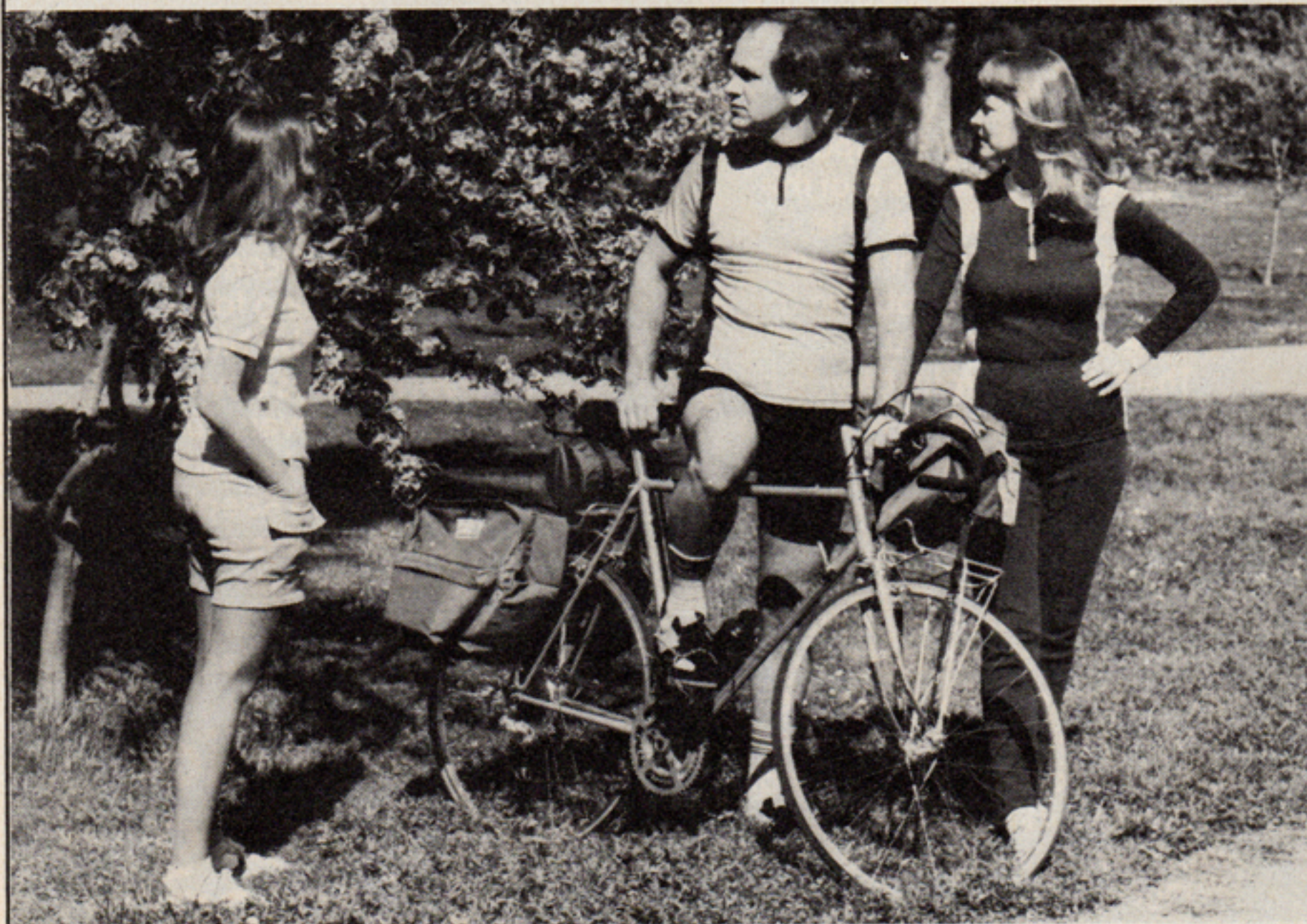
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The Fat Tire Revolution

How a Tiny Town
Adopted a Second
Sport for Its Own

John Rankin

Plymouth, New Hampshire, is a town that revolves around skiing. Come winter, local bike shops stock all the necessities. Nearby, eight kilometers of track and groomed trails beckon. In fact, the state's foremost ski team adopts Plymouth for its second home this time of the year.

But this year the town lacked only one crucial element: snow. There were only five snowy days in four months. This took its toll on both the tourist trade and the natives themselves, who were definitely restless.

Enter the fat-tire bike. Our bicycle shop immediately pushed all the ski equipment aside and began promoting a fat tire revolution, extolling the virtues of a bike possessing the sturdiness of a BMX and the elegance of a ten-speed.

We weren't sure whether the bikes would really catch on. I remember how apprehensive I had been on my first ride a few years ago. We outfitted an old beat-up BMX cruiser frame with fat tires and took a spin down an abandoned railroad bed. For a former club racer like myself, the sensation of actually *flying* over sticks, stones, and potholes was close to heaven. Wide tires could absorb anything, as I found riding through shallow river beds and up Stoney Hill, nicknamed for obvious reasons.

As my skill increased, I invested in better fat-tire bikes and took on more challenges. My favorite is "The Chute," a grass and dirt slope that's steeper than many downhill ski runs; so steep, in fact, that when you stand at the top, all you can do is swallow, shove off and scream, as you descend at over 20 mph.

Our antics soon attracted other fat-tire bike addicts including people like myself who had retired from racing and were looking for new challenges. Our regular

klunker club now numbers over 40, and we head out every Saturday to attack the nearby mountain trails and brush.

We often take along one or two newcomers, who seem hesitant at first. "Just get your feet wet," I remember urging one woman friend, who later did just that. While riding through a shallow river bed, she landed in a hidden mudhole, and flew headfirst over the handlebars into the muck.

"It's a dirty job, but someone has to do it," she laughed, emerging from her mudbath dirty, disheveled, and dripping.

WORKSHOP

We also managed to attract a lot of bicycle racers to our ranks. Many of the Plymouth locals, in lieu of snow skiing, took to fat-tire bikes to train this winter. They found banging down a dirt road gave them good bike handling skills.

A lot of other outdoorspeople, frustrated by a winter that boasted plenty of rain but no snow, began to buy fat-tire bikes. "It's a whole new frontier," boasted one former skier after taking a downhill

run on an actual 25-meter ski jump. "You might say that," another friend replied thoughtfully, taking in the mountain bike and the steepness of the slope. "You could also say 'You're nuts!'"

Finally, commuters are discovering the joy of beating the elements by joining them. The little snow we had this winter rapidly froze into a solid crust, making it nearly impossible for cars and buses to get through mountain passes for several days. But many commuters made it to work by riding atop the snow via klunkers. In fact, this interest in commuting around town isn't limited to just Plymouth. I was in New York City a few months ago and saw many cyclists for messenger services using fat-tire bikes. And no wonder: as a former bicycle messenger I can well appreciate a bike that can stand up to the deepest pothole, go over curbs, and at the same time make a quick getaway from irate drivers.

In the past two years, off-road biking has even taken on its own seasonal activities.

Starting in winter, there is ice racing with studded tires and group rides on the hard-packed snowmobile trails. Lots of clothes for warmth and padding are used, with state-of-the-art bicycling shoes actually being felt-lined boots.

In the spring, it's time for wrestling with the mud, as dirt roads thaw into swamps. The widest of knobby tires must be used with pressures of around 15 pounds for flotation and traction. A good hosing is always in order after a ride.

Summer means being able to get far from the madding crowd on multi-day trail rides. One of the more popular routes is through the White Mountain National Forest, which has a 100-foot waterfall, a spectacular high mountain pass, four or five river crossings, and a whole day's worth of riding uninterrupted by cars, roads, or anything else resembling civilization.

And on the really sizzling days of summer, you can take to the river. Providing the current and river bed are suitable, you can ride a klunker totally submerged, popping a wheelie to come up for air.

We discovered fall, with its brilliant foliage, is the best season of all. Many of the riders struggle all the way to the mountains' peaks, where the scenery is unrivaled and the roller-coaster descents challenge novices and seasoned riders.

But we still meet people who are less than enthusiastic about fat-tire bikes. "What's the ugly thing?" a customer asked me a few days ago.

"It's the wave of the future," I replied a little too solemnly, but then, I wasn't kidding.○

For more information: White Mountain Cycles, 40 South Main St., Plymouth, NH 03264.

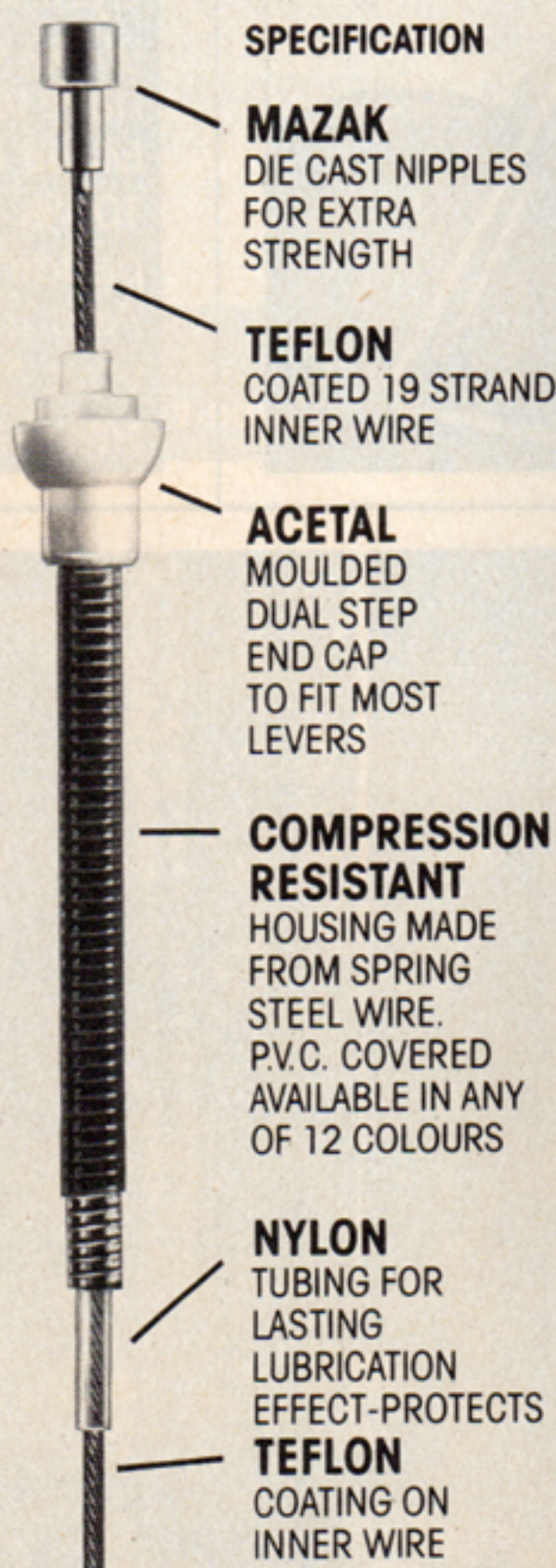
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Continued from page 120

age. (There are exceptions; Colorado off-road riders favor the same 170-millimeter cranks which are standard on most road bikes.) But now, the competition among off-road crank manufacturers is broadening: Takagi has a good triple crankset quite similar to the Sugino Aero Tour, and Sugino is hedging its bets with a T.A. copy.

Good wide-range touring derailleurs have always been available, but SunTour and Shimano have both designated specific models for off-road riding. Both companies plan to sell plenty of these derailleurs to skinny-tire riders, too. The skinny-tire riders should cooperate; the new models are quite good. (Shimano's is an offshoot of the self-centering Deore model; SunTour's Tech series derailleurs use two sprung pivots to wrap chain and keep the jockey pulley snuggled next to the sprockets at all times.)

4) Brakes: Cantilever brakes are just about mandatory on an off-road bike. The fat tire is so big that if you build an ordinary caliper brake big enough to reach all the way around it, the mile-long calipers squirm a lot and give a very mushy

feel. So cantilevers are necessary to deliver good braking performance.

Again, this is an area where building state-of-the-art stuff presented additional costs and headaches to manufacturers, and where the temptation to cut corners must have been strong. Brazing on four cantilever brake bosses adds to production costs, particularly since the bosses have to be very accurately positioned.

All our test bikes have cantilever brakes, and all stopped well. I developed a personal preference for Shimano's new cantilever brake, which has pads shaped to squeegee mud off the rims, and hand levers with about one-sixth more mechanical advantage than the Dia-Compe or Magura levers also used on fat-tire bikes. (The mechanical advantage depends on where your hand grips the lever, so it's impossible to give an exact figure.)

The Magura levers are best-suited to riders with large hands; Shimano and Dia-Compe levers feel better if your hands are small or average size. All three deliver plenty of cable pull; Shimano delivers the least with 15½ millimeters.

5) Quick-release seatposts: All our test bikes have quick-release seatposts, a feature which off-road riders began using when they recognized the prudence of lowering one's seat before going down a steep descent. (One area where the test bikes are weak, however, is seatpost length. No component manufacturer yet makes high-quality seatposts in the extra-long lengths dictated by the rules of balloon bike frame sizing.)

6) Handlebars and stem: The one-piece steel handlebar-and-stem combination, popularized by frame-builder Tom Ritchey, has become the dominant style in off-road bikes. Still, many builders opt for separate handlebars with a conventional stem. The important thing both styles have in common is hand position: your hands are out in front of you, as if you are about to grasp a baton with both hands. This gives you much more strength in the fingers and ease of controlling the bike than the old-fashioned upright handlebars which swooped back toward the rider. This hand position is absolutely essential for com-

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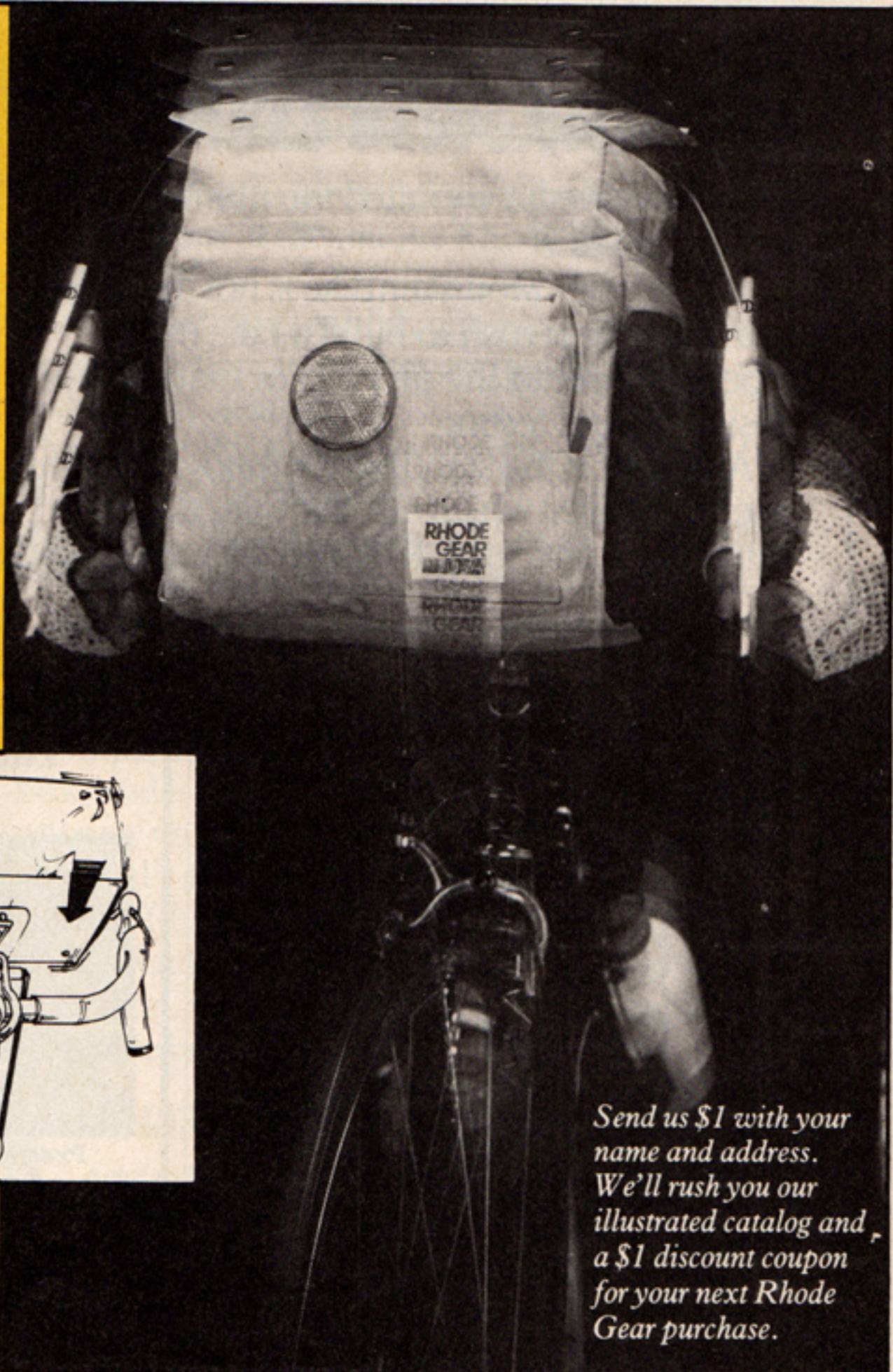
And speaking of good looks, wait 'til you see (and feel) Rhode Gear's elegant glove leather Handlebar Hide. For a durable, cushioned grip and a custom look that actually improves with use.

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fortable riding on an upright bike, particularly when you're climbing.

7) Pedals: Few riders opt for toe clips in the dirt, and I'm not one of them. Without toe clips, the job of the pedal changes: it must provide a good wide platform that grips your shoes. And you don't want the pedal to roll underneath your foot.

In the early days of balloon bike design, ordinary little BMX pedals were considered to be the state of the art. But they can roll underneath the foot—no good when you're in the middle of a rock-strewn descent—and the various styles of pedals which present a larger surface area to the foot are a big improvement. These pedals do look strange, but they work. I laughed at SunTour's "bear trap" style pedal the first time I saw it, but I became a believer when I rode on it: the more sure-footed feel of the larger pedal is a welcome improvement. The pedal's wide-stance grip of your shoe helps compensate for the lack of toe clips.

Gonzo Demands

All of these improvements have one thing in common: although they were inspired by the demands of gonzo competition in off-road races, they transfer remarkably well to the needs of the not-so-gonzo rider. Everything about off-road design makes the bike easier to control, more durable, and more convenient. Seldom has a product designed for specialized use and rigorous competition adapted so well to the needs of the less-demanding user. This is truly a bike that serves the novice and the expert alike—without any equipment modifications.

However desirable a klunker is for a novice, it is still not maintenance-free. Sealed-bearing hubs and crank spindles eliminate one major maintenance area, but you still have an exposed drivetrain to keep clean. If you ride through the muck a lot, you'll have to wash off and re-oil your chain frequently, and you'll need to replace it more often than a road rider. (Don't despair; it's a small price to pay for the fun of riding through the muck.) Your derailleurs will need periodic de-muckification.

One logical question, though, is why klunkers aren't equipped with low-maintenance internally geared hubs. The answer: those hubs were never designed for the stresses of extreme dirt climbs.

This was proven by one of the original Marin County klunker riders, Fred Wolf,



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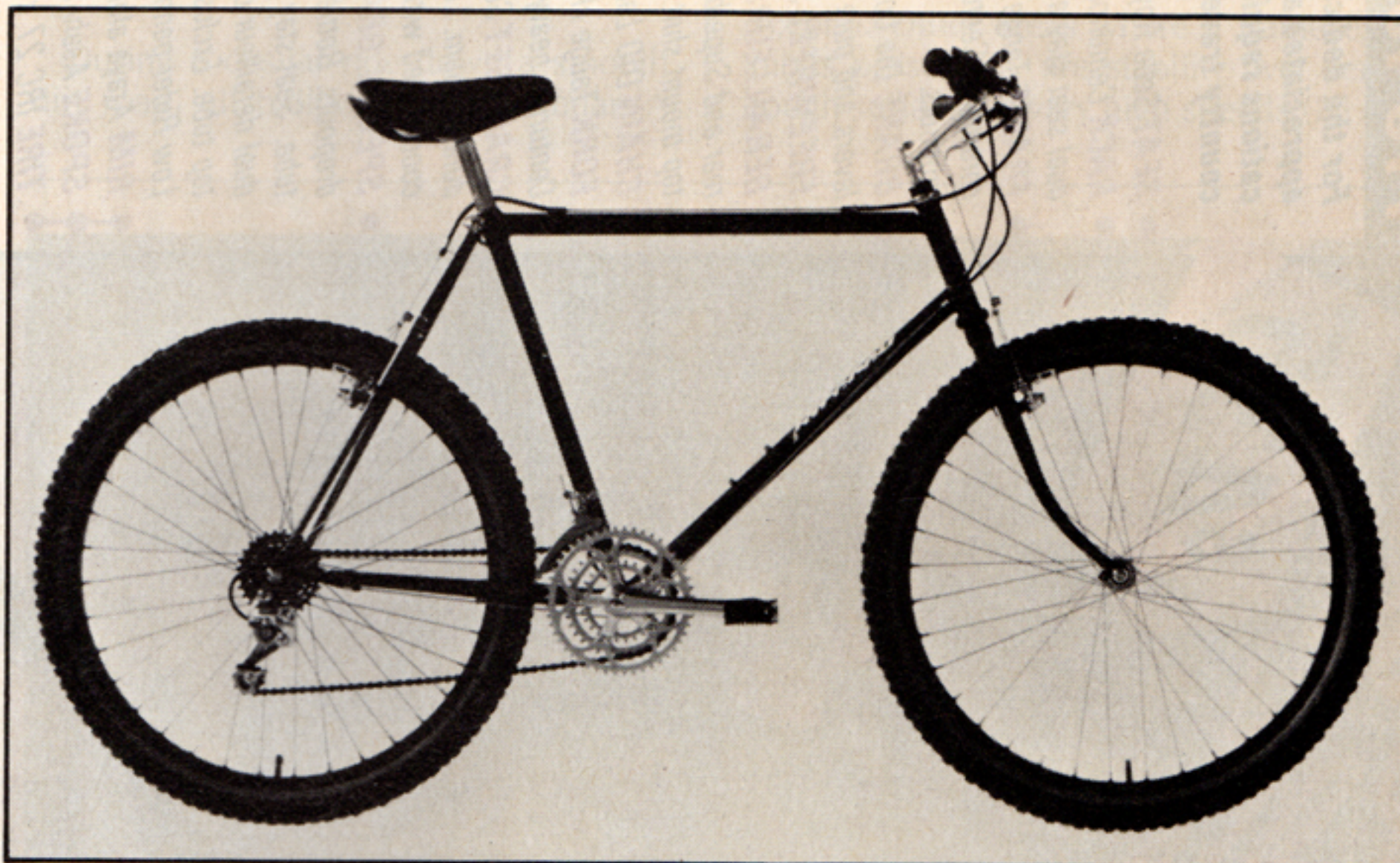
about eight years ago. Wolf equipped his old heavyweight balloon with hybrid internal hub/derailleur gearing, popped it into its lowest gear, settled his 210 pounds in the saddle, put his feet on the 190-millimeter Ashtabula cranks, and pointed the bike up a steep hill. Fifty yards later, the hub blew apart. The torque load was greater than the designer had ever dreamed a hub would be subjected to. A more expensive, better-made hub would work fine in the dirt. But first, someone has to build it.

When the test bikes first started arriving in our shop, I was stunned: they offered a lot more fancy technology than road bikes in the same circa-\$500 price range. Maintenance-free sealed-bearing hubs, nice triple cranksets, newfangled derailleurs that shift exquisitely, crank spindles sealed with O-rings, brazed-on bosses for rear racks and second water bottles, cantilever brakes, fancy new handlebars . . . Why all these goodies?

The manufacturers are battling each other for market share, and for recognition as serious contenders in this new

field. Both bike manufacturers and component manufacturers have busily tooled up for dirt riding; they have many good designs; and intense competition in a flat

MountainBikes Montari



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economy will keep prices low.

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Yet Cheaper

If you don't want to spend \$500 on a mud bike, no matter how pretty, all this talk about great value may strike you as a bit hollow. Never fear. Watch your bike shop's showroom floor; in the next six months, the inevitable round of yet-cheaper models will show up to vie for consumer dollars. I've seen early indications that even \$300 ballooners will be remarkably rugged and dirtworthy for the money, although we can expect elegant components and brazed-on niceties to wither away as prices drop.

Because the industry has so far shown a strong commitment to making its fat-tire bikes practical, I suspect that these bikes are destined to overtake dropped-handlebar, skinny-tire bikes as America's favorite. The balloonier is easier for a novice to feel in control of, and for any rider, novice or expert, to have casual fun on. The 1980s will see the end of wobbly tire tracks made by unsure casual riders on high-strung ten-speeds!

The Bikes

MountainBikes Montari: The MountainBikes Montari is a good standard design from which to discuss other designs, so I'll start with it.

MountainBikes was the first company to sell hundreds of off-road bikes, by dint of a partnership with the prolific custom framebuilder Tom Ritchey. That partnership continues, as evidenced by the Ritchey-built MountainBikes Annapurna in this test, but one man's output does not a major company make. So, in the interests of sales volume and preserving market share, MountainBikes is offering three Japanese-built models ranging from \$450 to \$750. The \$610 Montari is the middle bike in this lineup.

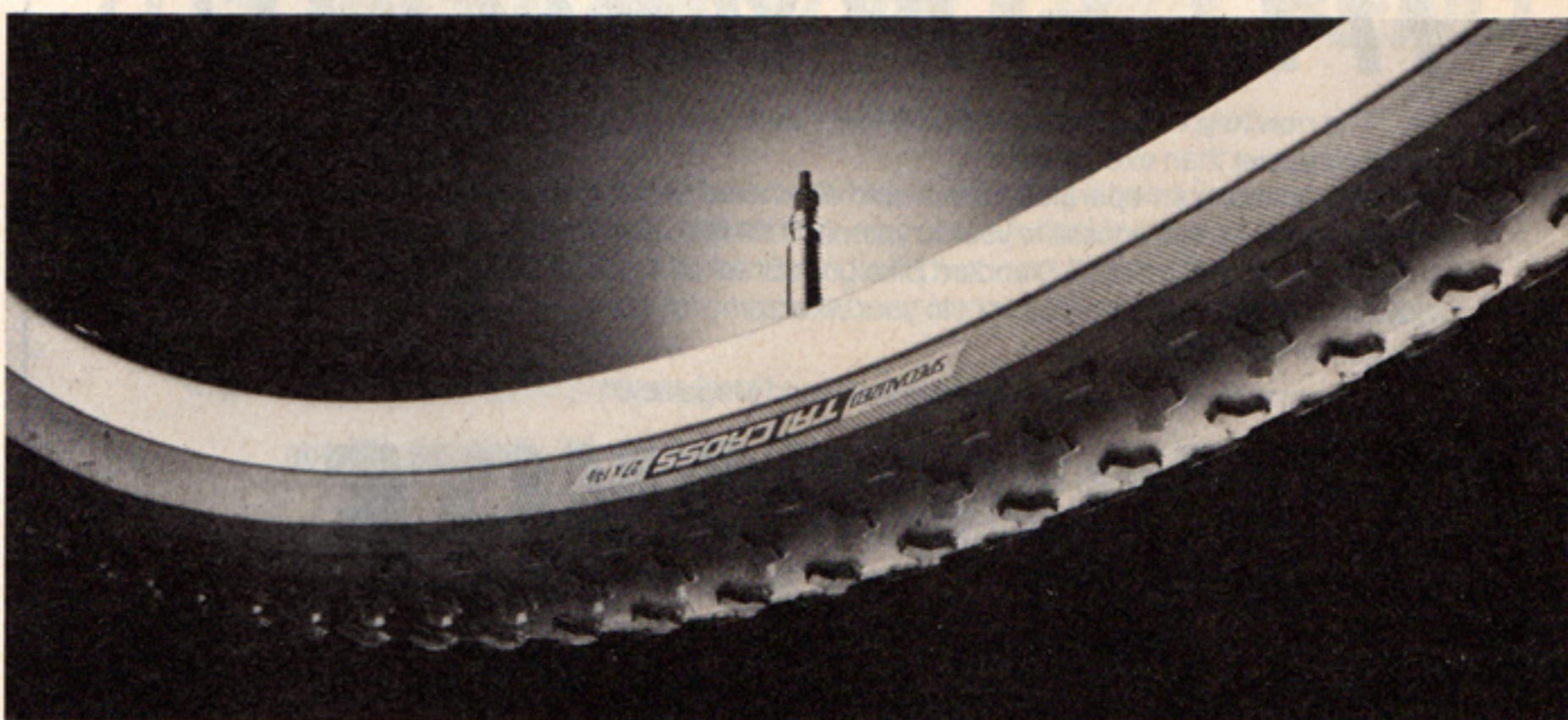
Components include the Takagi Tourney X-D crankset (interchangeable with Sugino AT), Shimano cantilever brakes, SunTour MounTech derailleurs, and Ritchey Bullmoose handlebar/stem combination. The double-buttressed frame tubing is TIG-welded without lugs. This construction looks unfamiliar to most adult cyclists, but it's been used with great success in BMX machines and motorcycle frames for many years. Not only that, it's how aircraft chrome-moly steel is assembled—so its viability is beyond ques-

tion. The seat tube is formed into an oval shape at the bottom bracket, to provide better bracing against sideways flex.

Demanding Maneuvers

During a casual ride down a smooth dirt road, all ballooners feel similar. A

ballooner shows its own personality during demanding maneuvers, and the maneuver we found that best shows a bike's personality is picking its way through rocks on steep, rocky climbs (and descents). Other areas where a frame exhibits personality are stability over very rough surfaces at very high speeds (25+



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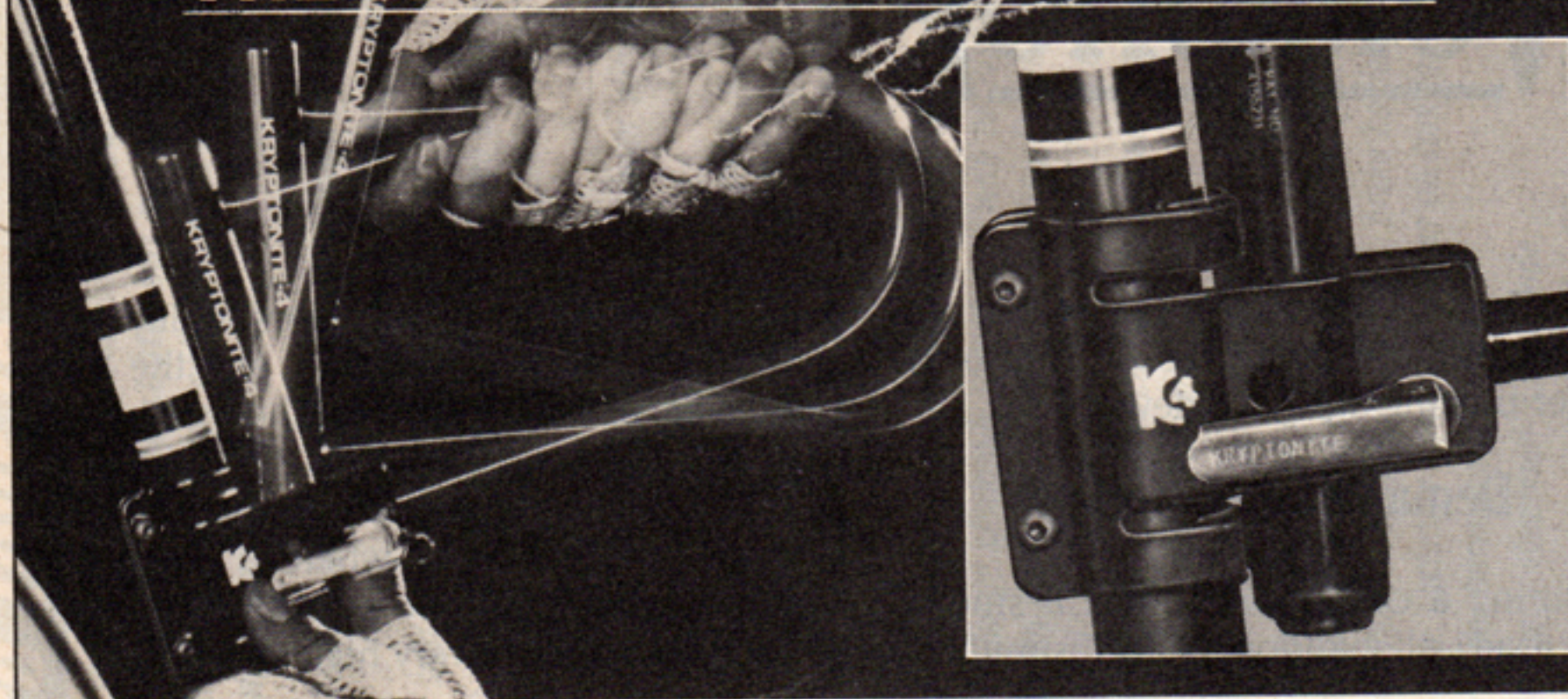
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mph), and entering and exiting controlled skids.

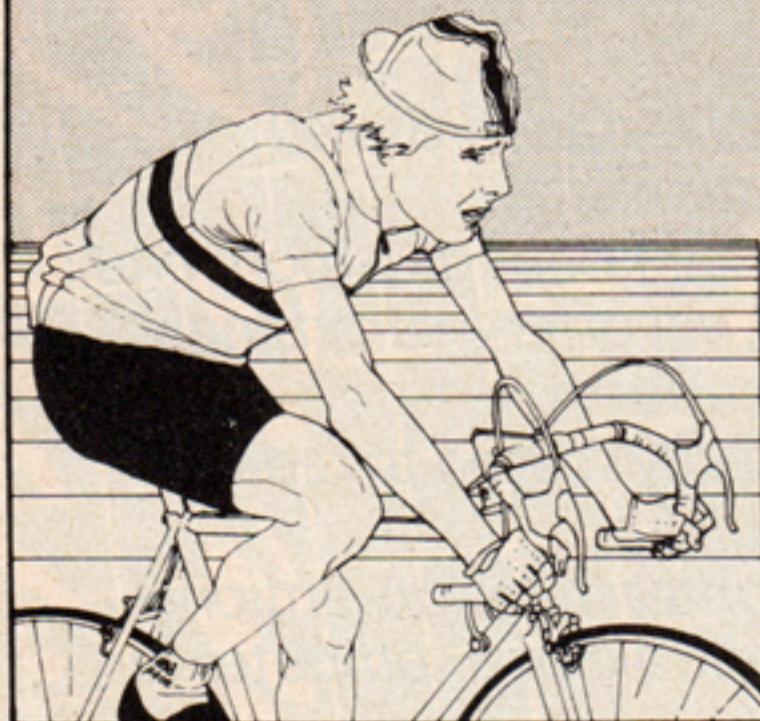
To a large extent, these attributes are in conflict—and the Montari is slightly biased in favor of the high-speed, gonzo approach to riding. It has a shallow head angle (69 degrees on the pre-production prototype we tested; 68 degrees on production bikes). This puts the front wheel farther away from you for high-speed and downhill stability; the front center measurement (front axle to crank spindle) is 25½ inches—par for off-road bikes and two to three inches more than a road bike. This is appreciated on steep descents!

Where this hurts you is slow-speed climbing. No bicycle is particularly stable at slow speeds, and the increased "wheel flop" (tendency for the wheel to fall sideways as well as steer) inherent in the shallow head angle worsens this problem by causing a curious reaction: the rider tends to overcorrect. When you're slogging at low speed, the frame geometry somehow fools the right side of your brain and you swing the handlebars too far. In an extreme case, the bike can even trick you into wobbling so much that you have to put a foot down.

This is not an insolvable problem. As you gain experience with the bike, you learn to avoid overcorrections, so you can handle a steep ascent as smoothly as anyone on any bike. But it is an additional skill to learn.

However, I should put all this in con-

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Specialized StumpJumper Sport

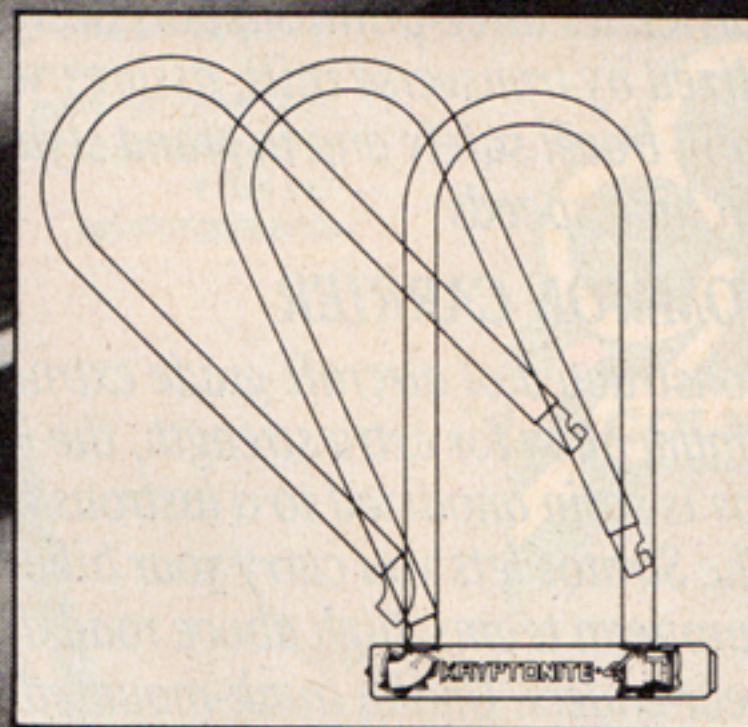
text: it's a pretty small problem with the Montari. It's a handling quirk that you notice only under extreme conditions, and a regular user will outgrow it. And the quirk is a small (and inevitable) price to pay for this bike's remarkable ability to carry you over rugged terrain.

Specialized StumpJumper Sport: Specialized was the first manufacturer to offer a Japanese³ factory-built off-road bike early last year. The original StumpJumper cost \$750 and sold as quickly as the boat could unload them. Then in the fall, Specialized introduced the StumpJumper Sport and scooped the market: the \$499 bike took advantage of production efficiencies to offer the same performance and component quality as the earlier StumpJumper for two-thirds the price. The StumpJumper Sport was the first bal-looner to offer the high component-quality-for-dollar-value I mentioned earlier.

Straight-gauge chrome-moly steel tubing, sealed-bearing hubs, SunTour MounTech derailleurs and a Sugino AT triple crankset are just a few of the components that, some months ago, caught my eye as being very elegant for a \$500 bike. It was quite a pleasant surprise when I learned months later that this level of

³Specialized is quick to point out that, although the frame and many components are made in Japan, other components came from France, Italy, and Switzerland. Wheelbuilding and final assembly were in California.

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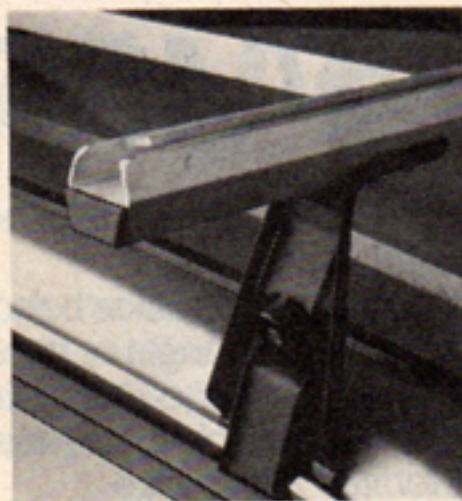
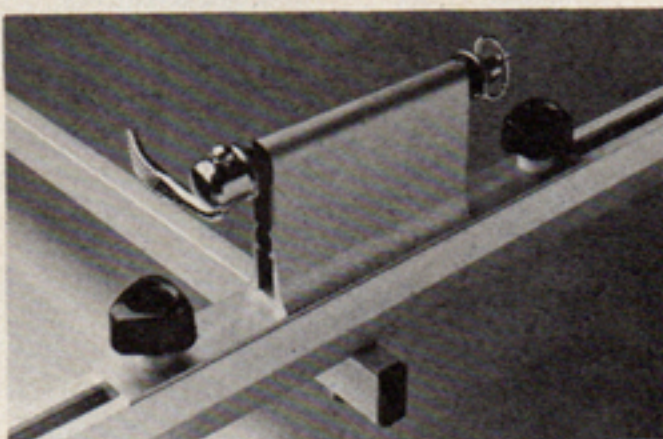
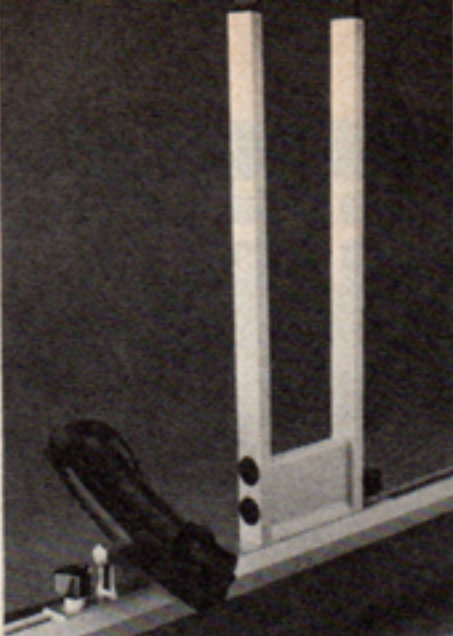
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WORKSHOP

componentry would be a ho-hum industry standard.

One of the StumpJumper Sport's best attributes is the range of frame sizes available. Frames as small as 16½ inches allow even short adults to buy a ballooner with plenty of straddle clearance. (At the other end of the scale, Specialized is building a custom 26-inch frame ballooner for basketball-playing bicycle enthusiast Bill Walton.)

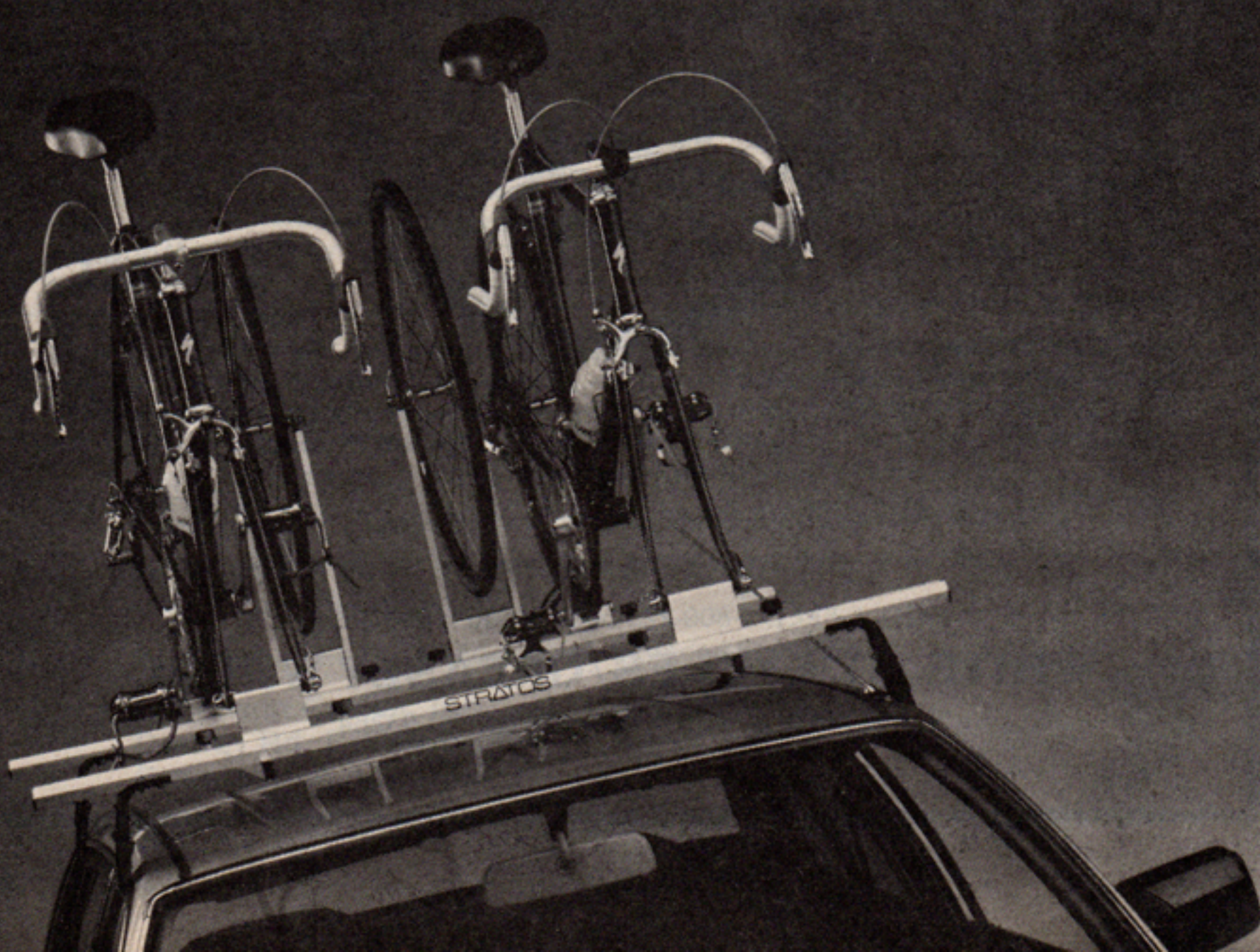
Our test bike's handling characteristics can be summed as follows: if you like steeper downhills than anyone else dares to tread upon, and skidding through turns with a control over the bike that no observer would understand, this is the bike for you.

The 67-degree head angle takes the needs of the gonzo rider to the maximum. Of course, this makes the StumpJumper Sport the most difficult bike to keep steady at slow speeds. Everything I said about the Montari in this department applies, only a bit more so. The increased wheel flop sacrifices a little maneuverability, but in return, it gives you a frame that wards off the effects of bumps. Just plow on through at speed; the StumpJumper Sport doesn't care.

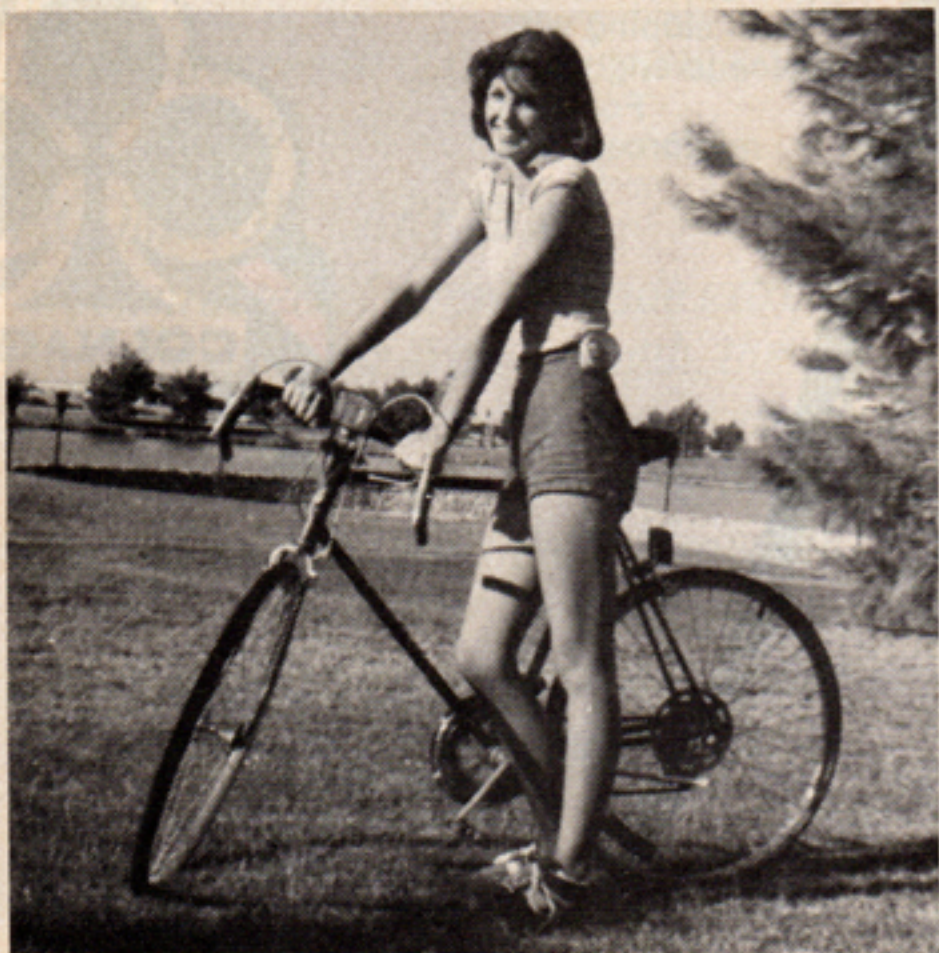
Another aspect of the head angle design tradeoff is aptly described by Specialized's Jim Merz: "If you're designing a bike for very heavy-duty use, it's not good to have the head angle even as steep as 70 degrees—with a steeper head angle, a lot more shock comes up through the front forks." Now, whether a 70-degree head angle is too shock-prone is a topic on which many experts will disagree. (Many of the roughest riders use a 70-degree head angle without any problem—but there's always the story of the guy who hit the log and. . .)

One other effect that is subtle but noticeable in a side-by-side comparison: the StumpJumper Sport favors the rider in the saddle, not out of the saddle, for steep climbs.

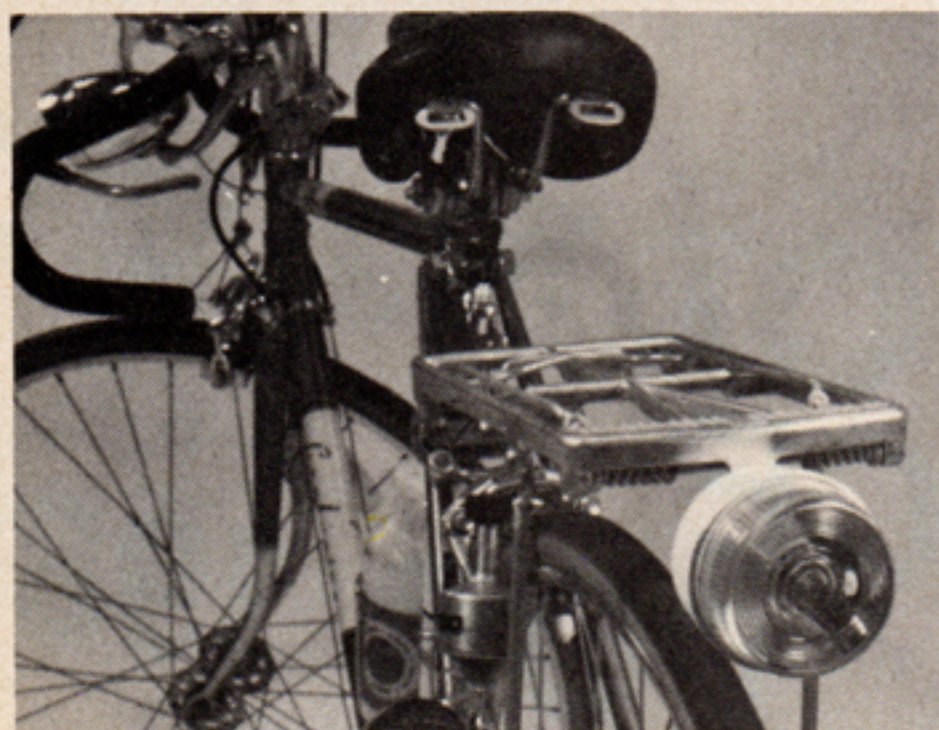
Specialized is making seven running changes in the StumpJumper Sport design: stays and fork blades are being upgraded to chrome-moly, the top tube is losing 20 millimeters—which will make it quite short for a ballooner—and redesigned separate handlebars and stems with a different rise and reach for each frame size will be used to give the bikes suitable rider fit. The head angle will be



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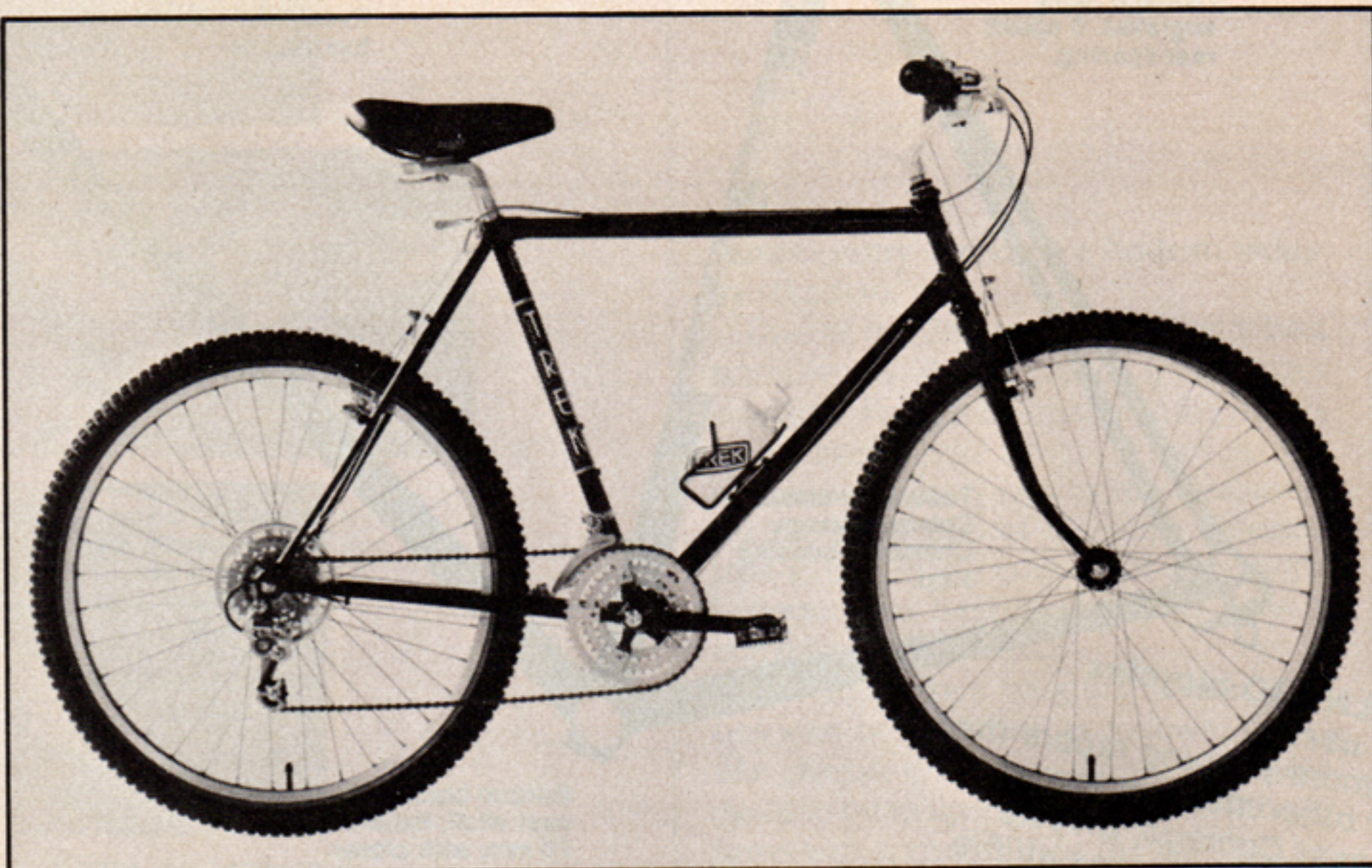
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WORKSHOP



Trek 850

68 degrees. (Since the StumpJumper's wheelbase is more than an inch longer than that of any other test bike, it will still be a gonzo frame after the design changes.) Shimano brakes, Specialized hubs, and fancier brazed-on fittings will be used.

The higher-priced StumpJumper has been reborn in a much fancier version with hand-filed lugwork, cutie recessed-bolt fittings, double-butt tubing, chromed dropout axle faces, and other upgraded touches.

Trek 850: Trek had a prototype balloon program under way a full year before offering a bike for sale. A lot of field testing, the input of a number of experienced downhill racers, and the personal preferences of Trek Design Engineer Tim Isaac went into the \$578, made-in-Wisconsin 850.

In our stable of test bikes, the StumpJumper Sport is one extreme; the Trek is another. It has the steepest head tube angle (71 degrees), shortest top tube, front center, and wheelbase (22 3/4, 23 5/8, and 42 1/2 inches), and the lowest bottom bracket (11 inches).

These measurements made me skeptical, and I expected that I wouldn't like the bike. But I was quite surprised by a riding test. The exquisite slow-speed controllability makes it feel very natural and easy to pick your course when you're climbing a steep boulder-strewn path. The bike has a combination of agility, stability, and ease of straight-line performance

that sounds like a mix of mutually exclusive qualities. But the mix is there, and a riding test shows it.

The long 19-inch chainstays enable you to keep some weight on the front wheel so you don't inadvertently pop a wheelie during a steep climb. The frame design works well for an out-of-the-saddle style on rock-strewn climbs.

Of course, nobody can disobey the laws of physics. On paper, the Trek's shorter front center dimension is a downhill drawback. But this would come into play only on slopes steeper than sane people (including your road tester) would dare descend.

And if you're that crazy, you may not need a long front center to stay in control. The riders Trek consulted gave the bike high marks on their steep downhill tryouts.

The Trek 850's short top tube is an eyebrow raiser. We found one true disadvantage: if you have long thighs and buy a bike with a small frame, we found that it's possible to hit your knees on the handlebars when you're out of the saddle and lunging forward. The little mounting bosses on the shift lever attachment bands are mean little devils to bang into. But this may well not be a problem for you; it wasn't for any of Trek's testers. Apparently, all of them are shorter of thigh than *Bicycling's* own Tom Walz, which isn't too surprising. For those of you whose thighs don't measure up to Tom's, the shorter top tube puts you in a more upright po-

WORKSHOP



Mt. Fuji

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sition. Designer Isaac did that on purpose to make the bike more comfortable.

All these design differences reflect Isaac's desire to optimize the bike for the needs of most riders, not for the most daring. Isaac himself often rides through the woods with his young son on the bike in a baby seat. He likes to execute difficult maneuvers slowly and gracefully, with perfect form—much like motorcycle trials competition.

The result is a bike with the most user-friendly handling of any lightweight bike I've ever ridden. It's extremely easy to feel in control of the 850. It's the perfect design to convert a nervous non-cyclist into a happy rider. Nevertheless, it's an amazing fact that a bike like the Trek, optimized for more sedate riding, is still excellent for gonzo competition (and vice versa). It shows how fundamentally excellent the lightweight fat-tire bike is.

The Trek is the most boss-happy of our test bikes. Brazed-on bosses are supplied for two water bottles, a rear rack, and both fender and rack eyelets on the front fork.

Mt. Fuji: Fuji is never known for radical innovation or for being the first on the block with the most exotic bike. But the company wants to be known for building "dependable, well-handling bikes," in the words of a company spokesman. The Mt. Fuji certainly qualifies. Moreover, it's a peach of a bike for \$550. It fairly drips with nice components and features.

Frame design is middle-of-the-road for a balloonier. On our large (22-inch) test

WORKSHOP



frame, a nice, long 23 $\frac{1}{4}$ -inch top tube and 68 $\frac{1}{2}$ -degree head angle added up to a reassuringly long 25 $\frac{3}{4}$ -inch front center. With 18 $\frac{1}{2}$ -inch chainstays, the bike has a 44-inch wheelbase.

I'd like to be able to describe all kinds of nuances in handling that these dimensions provide, but the truth is that the bike feels just like the MountainBikes Montari. All dimensions are within one-half inch and most are within one-quarter inch, so that's not too surprising. The handling can be described the same way as the Montari's handling: slightly oriented toward the gonzo rider, but quite suitable for anybody.

The bosses had their day in the Fuji factory, too. The bike is outfitted for expedition touring with double water bottle bosses and mounts for a rear rack. Only a single set of eyelets adorns each set of dropouts—a teeny weeny drawback for the rack-and-fender combination.

The Mt. Fuji we tested was a prototype, the second Fuji fat-tire bike to reach the U.S. Since building the prototype, Fuji has decided to opt for double-butt tubing, and to thicken the lugs from 1.2 to 1.6 millimeters, for added crashworthiness. Fuji is especially proud of the investment cast fork crown they developed for the oversized balloon fork blades and wide tire clearance. It is a good-looking casting, so you fork crown fanciers out there take note.

The Mt. Fuji, like many bikes in this price class, uses the new SunTour MounTech derailleurs. The front derailleur is a good-performing wide-range tri-



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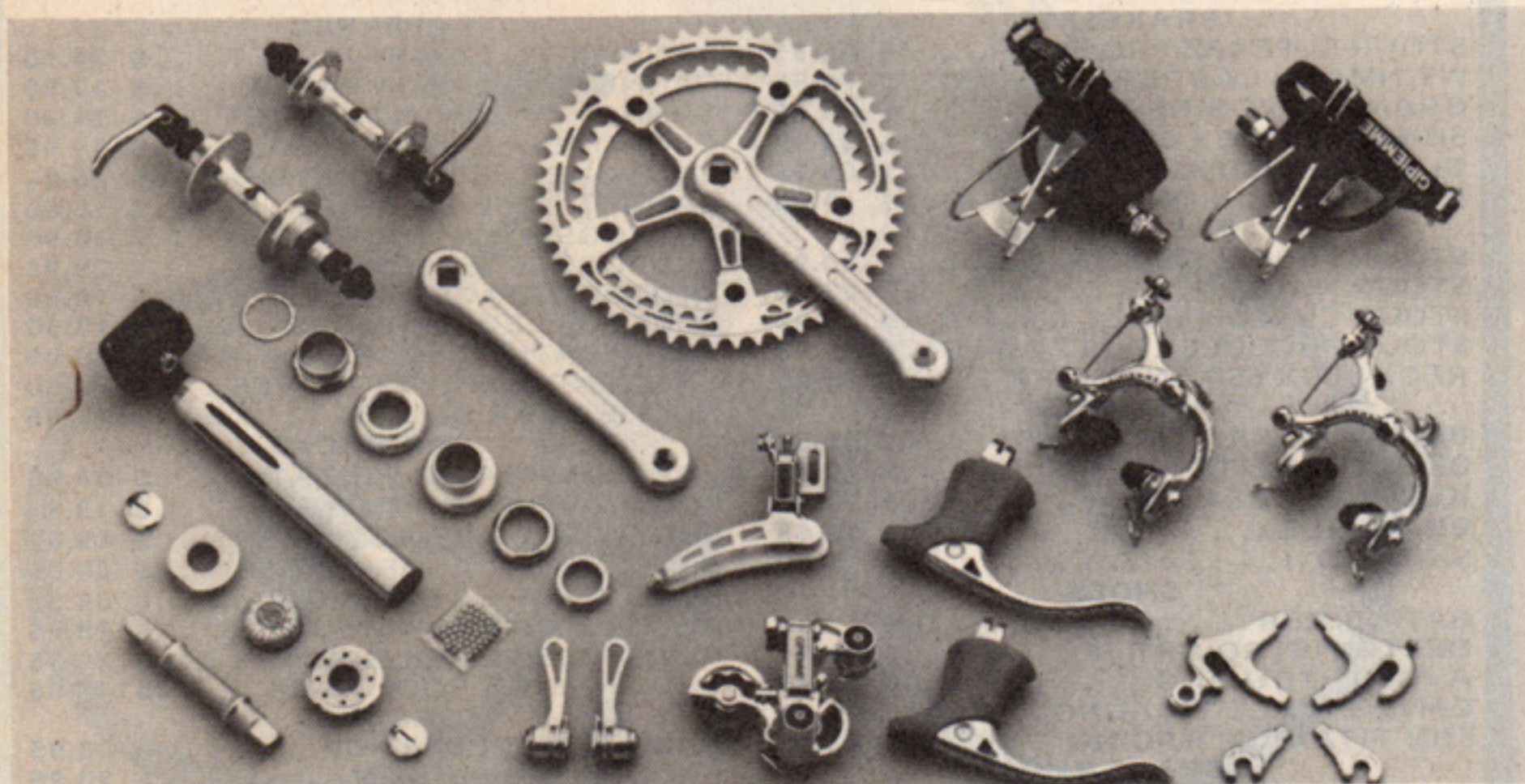
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ple; the rear derailleur has two sprung pivots for better shifting. Another innovation you'll notice more quickly is SunTour's "bear trap" XC-II pedals.

The "bear trap" pedals do feel better underfoot. You'll be seeing many innovations on the theme of pedals with large surface area—it's an idea whose time has come, and it's as useful for wing-tip commuting as it is for hiking-boot adventuring.

For an extra \$200 or so, you can buy the Mt. Fuji Special Edition with a brass fillet lugless frame, aluminum handlebar stem with separate handlebars, Sunshine Gyromaster hubs, and a sealed derailleur tension pulley.

Diamondback Ridge Runner: Diamondback is the BMX brand name that corresponds to Centurion road bikes, and the name may be new to *Bicycling* readers. (It was to me.) Centurion and Diamondback bikes are sold primarily in Western and Southern states, so they're a rarity in the Great Northeast.

(Limited quantities of Diamondback Ridge Runners are available in the Northeast through Security Seal Co. in Hempstead, New York.)

It's definitely the Northeast's loss. The \$475 Ridge Runner is the best value of the bikes in this test. Component for component, it lines up with or outclasses the other bikes. It's an added bonus to find SunTour's Superbe Tech derailleurs on this bike (see photo). The frame uses straight-gauge tubing—a good way to keep the price down.

The Ridge Runner's frame dimensions are well suited to my personal preferences (which may or may not be the same as yours). The 70-degree head angle gives the bike more passive stability, and the bike is easy to climb up a steep, rock-strewn path.

The 23½-inch top tube is losing 20 millimeters in a running change at the factory—a change that short-torso riders will welcome. (This change is probably best for most riders, but the science of fitting balloon bikes to riders is so embryonic that it's hard to make concrete pronouncements.)

The 18½-inch chainstays keep the rear wheel far behind you to prevent inadvertent wheelies on steep climbs. And the 12¾-inch bottom bracket is the highest in the test—good for you log hoppers.

Like Fuji, Diamondback has no pretenses of building the most radical designs (but then, what mass manufacturer does?). The company consulted a number of other manufacturers in developing the design of the Ridge Runner, and the



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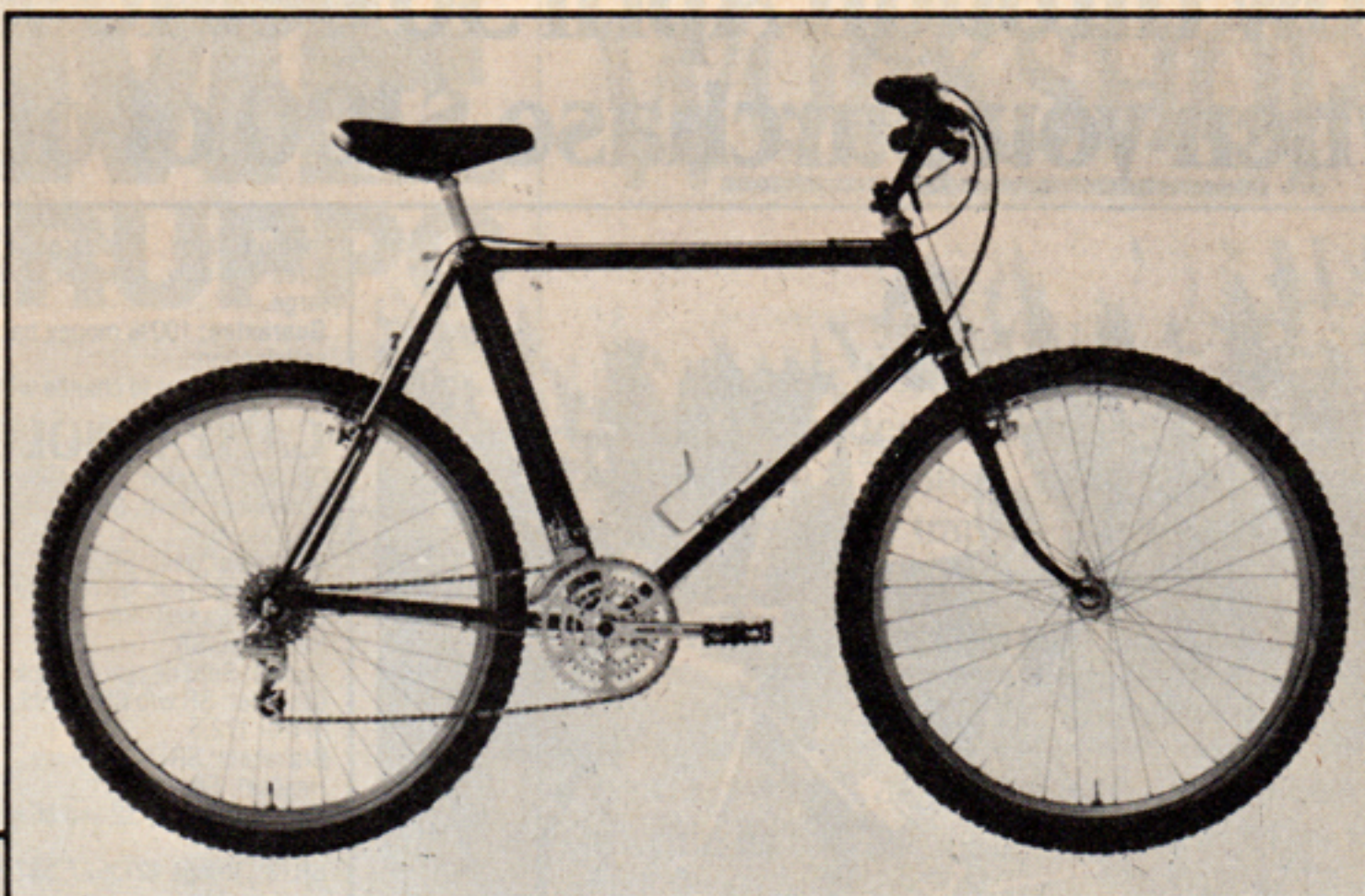
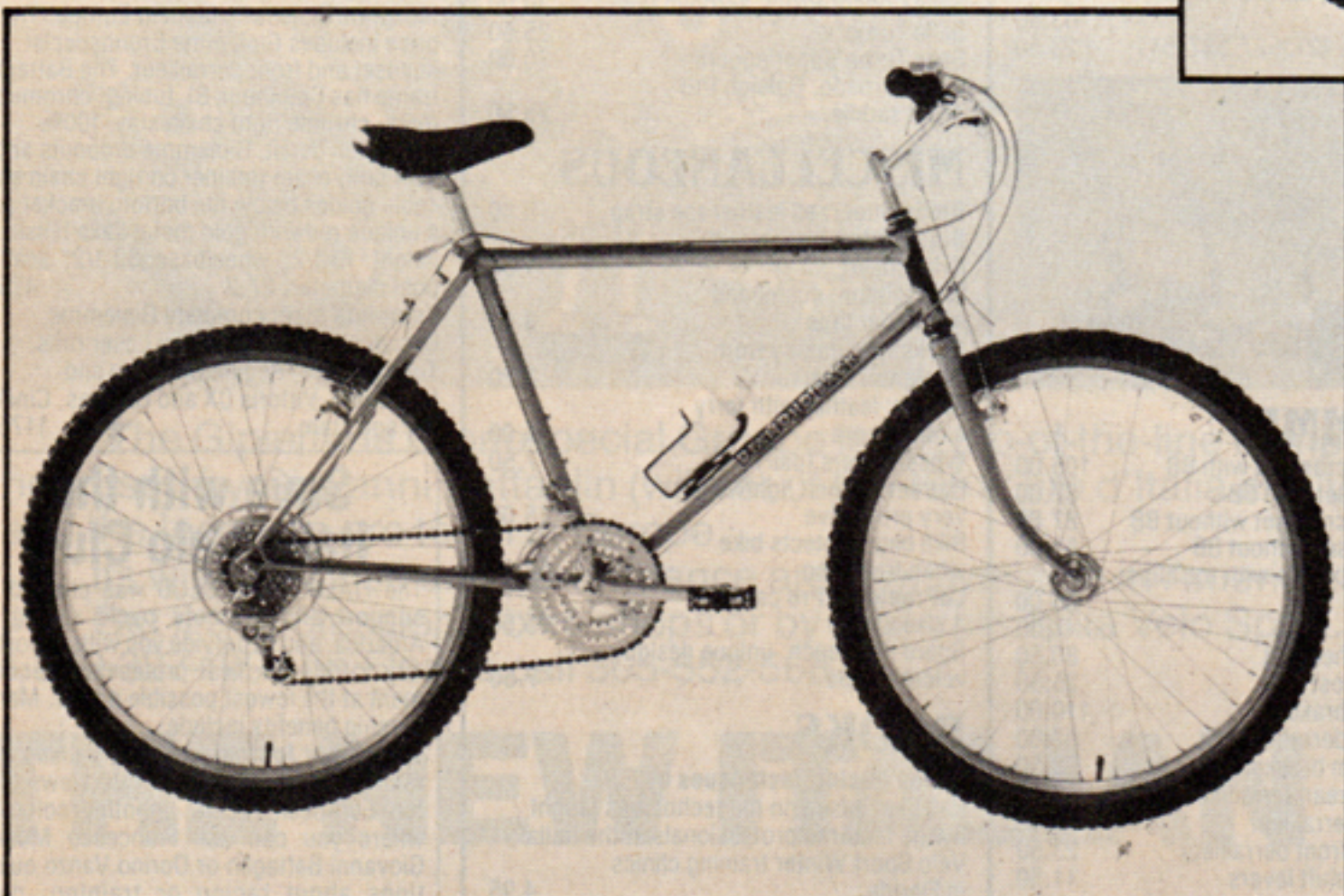
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WORKSHOP

Diamondback Ridge Runner



Ritchey MountainBikes Annapurna

design is based on others before it that worked well. As a company spokesman modestly put it, "We tried to make it right."

Diamondback may introduce a less-expensive klunker later this year.

Ritchey MountainBikes Annapurna: If you just want a bike to get muddy, the MountainBikes Annapurna, handbuilt by Tom Ritchey, is not for you. But if you want a beautiful connoisseur item, one of the more beautiful pieces of sculpture in town, the Annapurna isn't



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such a bad deal—at \$1,828. The only way to spend more is to buy a tandem.

The flagship of custom ballooners has frame geometry and handling much like the factory-built MountainBikes Montari. Frame dimensions do differ, but never by more than one-half inch. Is the Annapurna a better-handling bike? Does all that money buy you performance? It's frustratingly difficult to answer that question. Road testing is subjective, and the power of suggestion does exist. The bike did feel awfully easy to maneuver, like the time I heaved on the bars and skidded the front tire sideways to dodge a manhole cover. But maybe I could have done that on any of the other bikes, too.

There is no disputing the superiority of the Annapurna's framework and finish, however. Ritchey has always built lugless balooner frames with big brass fillets, flawlessly radiused so that one tube blends into another underneath the paint. A while ago, Ritchey began adding reinforcing sleeves to his frames at the joints, and the edges of the sleeves were filed to a fine taper—adding to the bike's attractiveness.

The Annapurna takes this one more step: each tube gets a reinforcing sleeve at the head and seat joints, and the sleeves are cut like long-point lugs, then tapered delicately. With a flawlessly radiused brass fillet on top of these look-like-lug sleeves, the bike is one of the two or three prettiest I've ever seen at any price. The combination of smoothly flowing contours from the brass fillet and the delicate line relief of the tapered sleeve edge is genuinely fun to look at.

Many of the components display this level of workmanship. The Ritchey-built Bullmoose handlebar/stem combination has the same nicely radiused fillets as the frame, and it's painted to match. A hardwood plug adorns the top of the steerer tube. Phil Wood hubs, Campagnolo quick-releases, Edco aluminum headset, and other such finery help drive the price up. Sizes from 18 to 26 inches are available.

Our bike came with few brazed-on bosses. There are no eyelets; hence, no rack is possible. There is one set of water bottle bosses. You can order more, but if you don't, the basic bike comes clean and stripped.

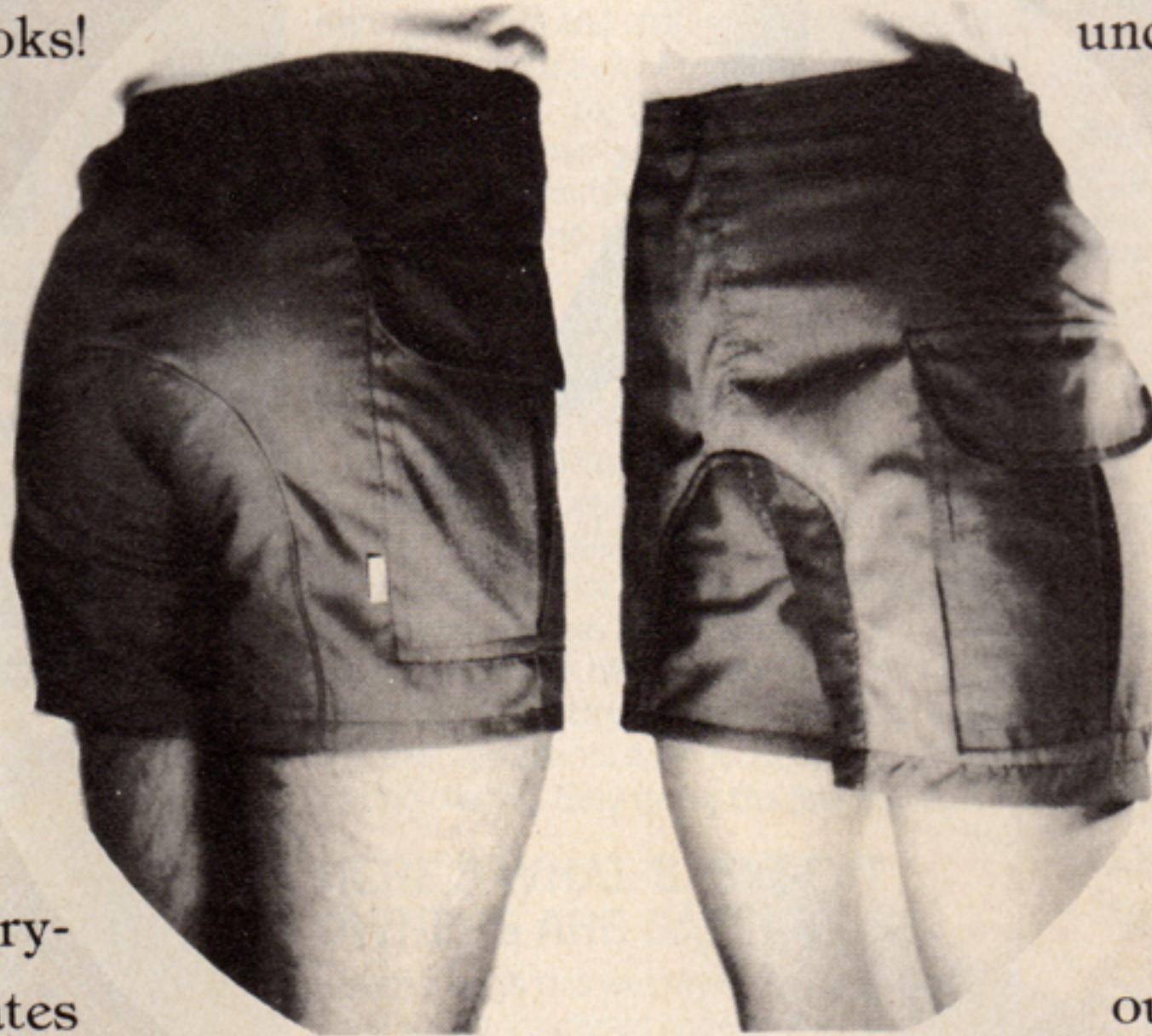
In closing: This year, there are lots of good off-road bikes on the market. We couldn't evaluate every bike that will be offered at your local shop, but you can. Take along your tape measure and use these reviews as a starting point from which to evaluate the bikes you're considering. And remember, as long as everyone is copying everyone else's designs, you can't go wrong. All the frames we've seen have good off-road capability (to say nothing of their performance on pavement) and all are unbelievably rigid. Yet, all absorb road shock very well. The differences are tiny; the similarities are great.

In the midst of the mid-February snowstorm that dumped a record-setting two feet of snow in our locale, our Associate Editor Crispin Miller found his car wouldn't start. Since he had little choice, he rode the Mt. Fuji home. He passed plenty of stranded and abandoned cars. True, he did have to walk the bike through the thicker unplowed sections, but it did get him home. If you ever wanted an omnipotent bike, look no further. Fat is where it's at.○

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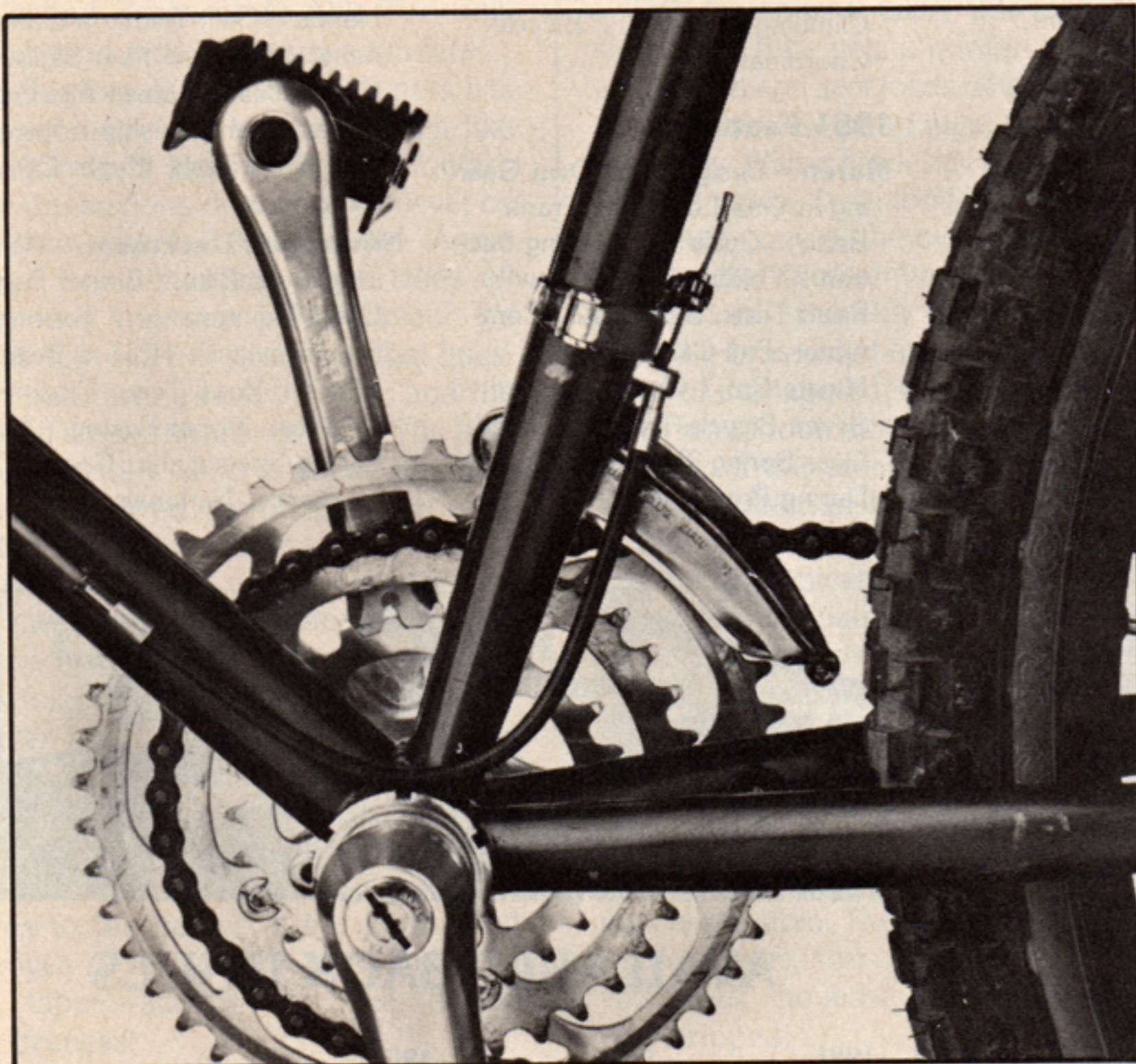
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WORKSHOP

MOUNTAINBIKES MONTARI

Imported by: MountainBikes Inc.
P.O. Box 405
Fairfax, CA 94930

SUGGESTED RETAIL PRICE: \$610

SIZES AVAILABLE: 20, 21½, 23 inches; size tested, 21½ inches

WEIGHT: 30 pounds, 1 ounce

FRAME: double-butt chrome-moly steel tubing; TIG welded; brazed-on bosses for fenders and one water bottle; Hatta Swan headset

WHEELS

Rims _____ Araya Model 7X, 26 x 2.125
aluminum alloy; weight, 620 grams

Hub _____ Suzue sealed-bearing
small-flange with axle nuts

Spoking _____ 36 spokes, 14-gauge,
laced cross-four

Tires _____ IRC Racer X-1, 26 x 2.125;
40-50 psi

DRIVETRAIN

Derailluers _____ SunTour MounTech
front and rear with ratchet-style SunTour thumb shifters

Chain _____ DID

Crankset _____ Takagi Tourney fully
forged triple

Crankarm length _____ 180 mm

Freewheel _____ SunTour Perfect

COMPONENTS

Pedals _____ MKS Footjaws rat-trap

Seatpost _____ SR Laprade one-bolt
microadjust, 220 mm length, 26.8 mm diameter

Saddle _____ Avocet Touring nylon
with foam padding, leather cover and saddlebag eyelets

Handlebars _____ one-piece Bull-
moose TIG-welded steel bars and stem; 25 inches wide

Brakes _____ Shimano cantilever with
Shimano hand levers

GEARING IN GEAR INCHES

	26	36	48
14	48	67	89
17	40	55	73
20	34	47	62
24	28	39	52
28	24	33	45

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San Jose, CA 95112

SUGGESTED RETAIL PRICE: \$499

SIZES AVAILABLE: 16½, 17½, 19½, 21½, 23 inches; size tested, 19½ inches

WEIGHT: 32 pounds, ½ ounce

FRAME: straight-gauge chrome-moly steel tubing throughout; bosses for rear rack and one water bottle; fender eyelets; brake and derailleur cable guides; Specialized headset

WHEELS

Rims _____ Araya Model 7X, 26 x 2.125
aluminum alloy; weight, 620 grams

Hubs _____ SunTour sealed bearing
medium-flange with axle nuts

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WORKSHOP

Spoking _____ 36 spokes, 14-gauge,
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Tires _____ Specialized Stumpjumper 26 x 2.125; 35-40 psi; Schraeder valves

DRIVETRAIN

Deraillleurs _____ SunTour MounTech
front and rear with SunTour ratchet-style thumb shifters

Chain _____ Shimano Uniglide

Crankset _____ Sugino Aero Tour Triple fully forged

Crankarm length _____ Sugino Aero Tour Triple fully forged

Freewheel _____ SunTour Perfect

COMPONENTS

Pedals _____ SR Surefoot rat-trap

Seatpost _____ SR Laprade one-bolt
microadjust, 220 mm length, 26.0 mm diameter

Saddle _____ Avocet Touring II nylon
with leather cover and foam padding and saddlebag eyelets

Handlebars _____ one-piece TIG-welded steel bars and stem; 27 1/2 inches wide

Brakes _____ Mafac cantilever with
Dia-Compe hand levers

GEARING IN GEAR INCHES

	26	36	46
14	48	67	85
18	38	52	66
22	31	43	54
26	26	36	46
30	23	31	40

TREK 850

Manufactured by: Trek Bicycle Corp.
801 W. Madison St.
Waterloo, WI 53594

SUGGESTED RETAIL PRICE: \$578

SIZES AVAILABLE: 18, 19 1/4, 22, 24 inches; size tested, 22 inches

WEIGHT: 30 pounds, 15 1/2 ounces

FRAME: chrome-moly steel tubing; brazed-on bosses for two water bottles, rear rack, brake and derailleur cables; double front eyelets and single rear eyelets; Tange headset

WHEELS

Rims _____ Araya Model 7X, 26 x 2.125
aluminum alloy; weight, 620 grams

Hubs _____ SunTour sealed bearing
medium-flange with axle nuts

Spoking _____ 36 spokes, 14 gauge,
laced cross-four

Tires _____ National 26 x 2.125; 40-
50 psi; Schraeder valves

DRIVETRAIN

Deraillleurs _____ SunTour MounTech
front and rear with SunTour ratchet-style thumb shifters

Chain _____ Sedisport

Crankset _____ Sugino Aero Tour Triple fully forged

Crankarm length _____ 170 mm

Freewheel _____ SunTour New Winner

COMPONENTS

Pedals _____ SR MP 131 rat-trap

Seatpost _____ SR MTE-100; 220 mm
length; 27.2 mm diameter

Saddle _____ Avocet Touring I nylon
with leatherette cover and foam padding and saddlebag eyelets

Handlebars _____ SR upright handle-
bars with SR MTS-100 aluminum stem; 26 inches wide

Brakes _____ Dia-Compe cantilever
with Dia-Compe hand levers

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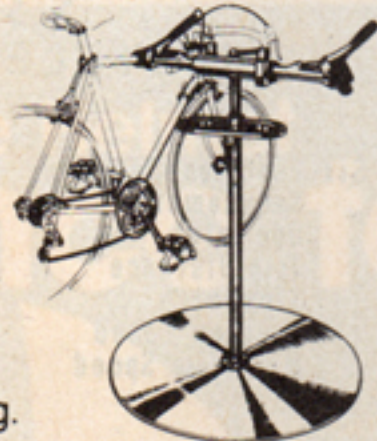


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14	48	67	85
17	40	55	70
20	34	47	60
24	28	39	50
30	24	33	40

MT. FUJI

Imported by: Fuji America
118 Bauer Dr.
Oakland, NJ 07436

SUGGESTED RETAIL PRICE: \$550

SIZES AVAILABLE: 18½, 20, 22 inches; size tested, 22 inches

WEIGHT: 31 pounds, 9 ounces

FRAME: double-butt chrome-moly tubing; brazed-on bosses for front and rear fenders, two water bottles, and a rear rack; cable guides for brake and derailleurs; Hatta Swan headset

WHEELS

Rims _____ Ukai "Beach Cycle" 26 x 2.125 aluminum alloy

Hubs _____ SunTour sealed bearing small-flange with axle nuts

Spoking _____ 36 spokes, 14 gauge, laced cross-three

Tires _____ Mitsubishi Competition III 26 x 2.125; 35 to 40 psi; Schraeder valves

DRIVETRAIN

Derailleurs _____ SunTour Superbe

Tech front and rear with ratchet-style SunTour thumb shifters

Chain _____ HKK

Crankset _____ Sugino Aero Tour Tri-

ple fully forged

Crankarm length _____ 175 mm

Freewheel _____ SunTour Perfect

COMPONENTS

Pedals _____ SunTour XC-II "bear trap"

Seatpost _____ one-bolt, 200 mm

length, 26.4 mm diameter

Saddle _____ Fujita saddle with nylon base, leather cover and foam padding; no eyelets

Handlebars _____ one-piece TIG-

welded steel bars and stem; 27 inches wide

Brakes _____ Dia-Compe cantilever

with Dia-Compe hand levers

GEARING IN GEAR INCHES

	26	40	48
14	48	74	89
16	42	65	78
18	38	58	69
20	34	52	62
23	29	45	54
26	26	40	48

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Imported by: Western States Imports
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WEIGHT: 31 pounds, 7 ounces



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WORKSHOP

FRAME: straight-gauge chrome-moly steel tubing; brazed-on bosses for front and rear fenders, rear rack, and two water bottles; top tube cable guides and derailleur cable guides; Tange headset

WHEELS

Rims _____ Araya Model 7X, 26 x 2.125 aluminum alloy; weight, 620 grams
Hubs _____ SunTour sealed bearing small-flange with axle nuts
Spoking _____ 36 spokes, 14-gauge, laced cross-four
Tires _____ IRC Racer X-1 26 x 2.125; 40-50 psi; Schraeder valves

DRIVETRAIN

Deraillleurs _____ SunTour Superbe Tech front and rear with ratchet-style SunTour thumb shifters
Chain _____ DID "L"
Crankset _____ Sugino Aero Tour Triple fully forged
Crankarm length _____ 180 mm
Freewheel _____ SunTour New Winner

COMPONENTS

Pedals _____ SunTour XC-1 "bear trap"
Seatpost _____ SR Laprade one-bolt microadjust; 220 mm length; 26.6 mm diameter
Saddle _____ Sella Royale nylon with leather cover and foam padding and saddlebag eyelets
Handlebars _____ one-piece TIG-welded steel bars and stem; 27½ inches wide
Brakes _____ Dia-Compe cantilever with Dia-Compe hand levers

GEARING IN GEAR INCHES

	26	36	46
14	48	67	85
16	42	54	75
20	34	47	60
24	28	39	50
30	23	31	40

RITCHEY MOUNTAINBIKES ANNAPURNA

Manufactured by: MountainBikes Inc.
P.O. Box 405
Fairfax, CA 94930

SUGGESTED RETAIL PRICE: \$1,828

SIZES AVAILABLE: 18 through 26 inches in one-inch increments; size tested; 22 inches

WEIGHT: 29 pounds, 4½ ounces

FRAME: Tange double-butted chrome-moly steel tubing; water bottle bosses; gold anodized Edco Competition headset

WHEELS

Rims _____ Araya Model 7X, 26 x 2.125 aluminum alloy; weight, 620 grams
Hubs _____ Phil Wood sealed bearing medium-flange with Campagnolo QR front and rear
Spoking _____ 36 spokes, 14-gauge, laced cross-four
Tires _____ IRC Racer X-1, 26 x 2.125; 40-50 psi

DRIVETRAIN

Deraillleurs _____ Simplex SJA 103 front; SunTour Superbe Tech rear; SunTour ratchet-style thumb shifters
Chain _____ DID "L"
Crankset _____ T.A. Cyclotouriste triple
Crankarm length _____ 180 mm
Freewheel _____ SunTour New Winner

COMPONENTS

Pedals _____ SunTour XC-1 "bear trap"
Seatpost _____ Custom Cunningham

seatpost with SR Laprade one-bolt microadjust clamp; 280 mm length; 26.8 mm diameter

Saddle _____ Avocet Touring II nylon with foam padding and leatherette cover and saddlebag eyelets

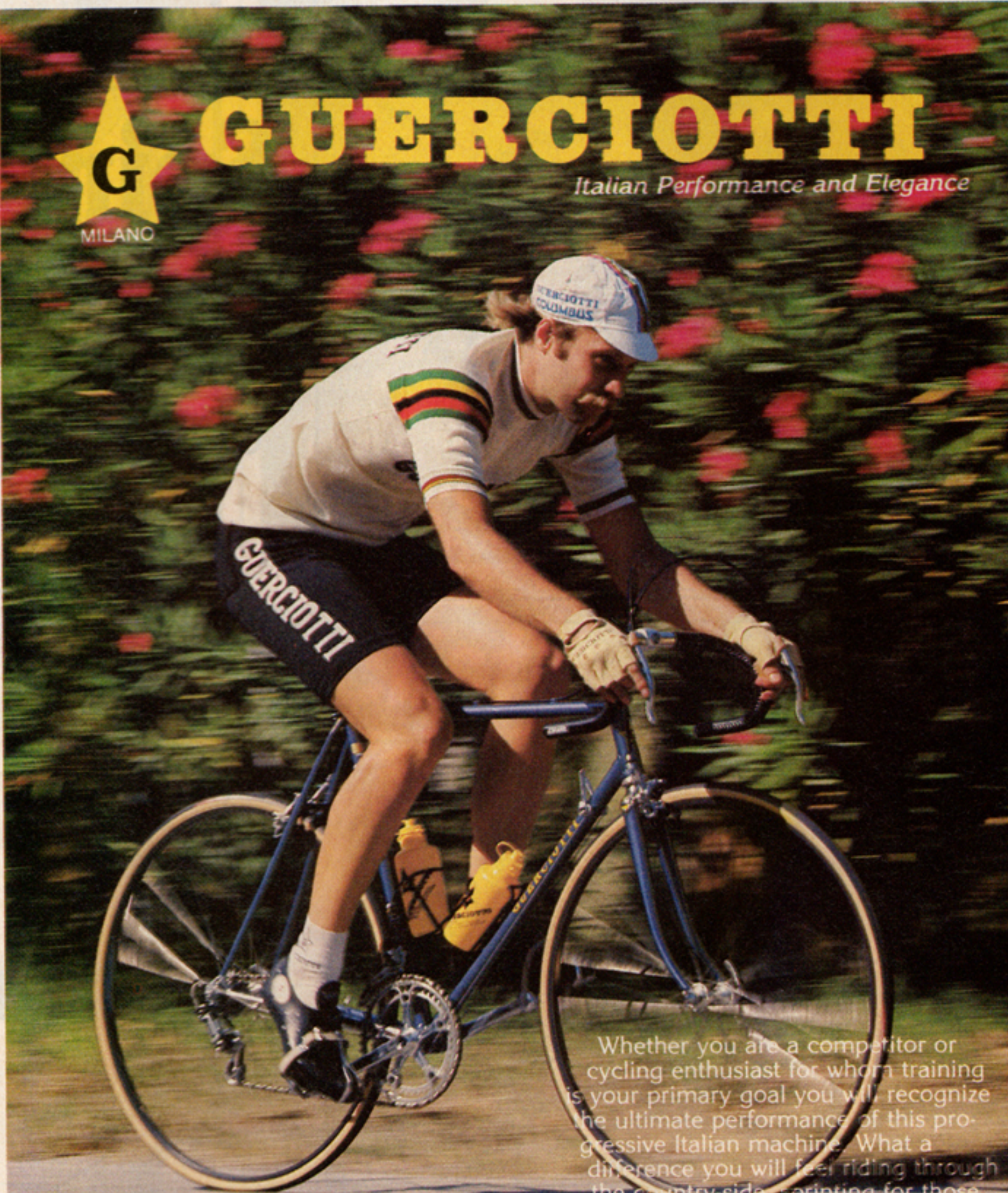
Handlebars _____ Tom Ritchey fillet-brazed Bullmoose painted to match frame with hardwood plug; 25 inches wide


Brakes _____ Shimano cantilever with Magura motorcycle handlebars

GEARING IN GEAR INCHES

	26	36	46
13	52	68	92
15	45	59	80
17	20	52	73
20	34	44	62
24	28	37	52
28	24	32	40

Thanks to Tom Walz for his help with this road test.






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