

Recumbent Cyclist

MAGAZINE

Nov - Dec 1992

RCM #13



Cover Story

THE
EASY
RIDER
3
TRIKE

TEAM CHEETAH
BREAKS HPV SPEED RECORD
68.77 mph

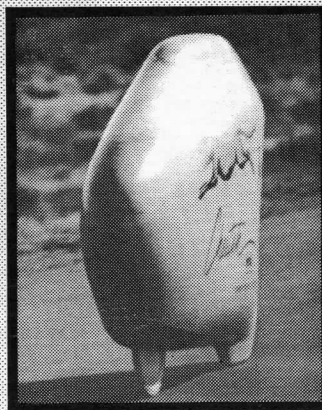
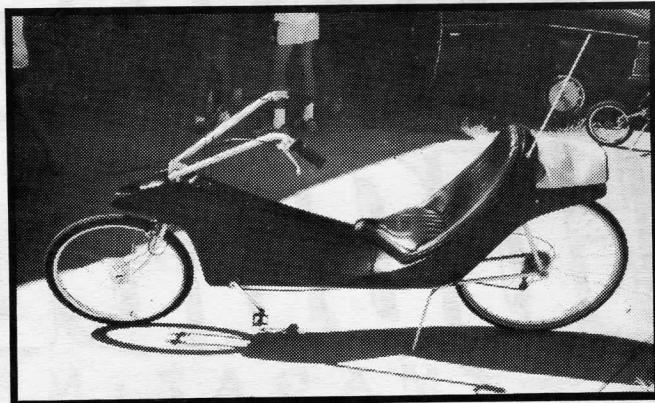
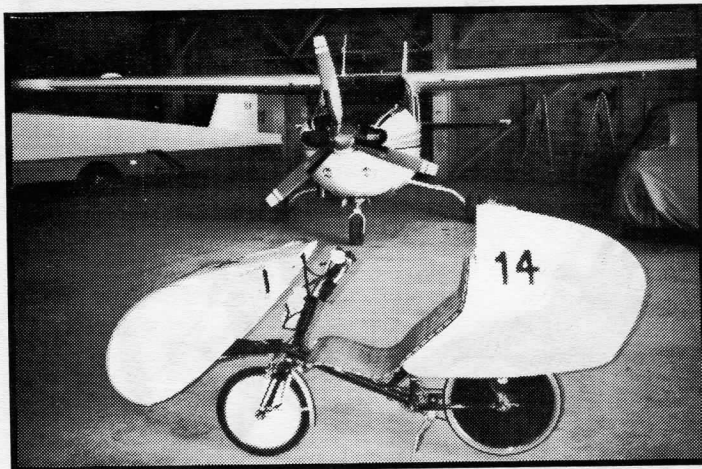


Photo Gallery



**The Bat-Bike? This is the prototype for a never-produced composite recumbent
(Photo courtesy of Peter Sharp)**



**Ran D. St. Clair's beautiful suspended MWB HPV.
This bike won the 1992 IHPSC Practical Vehicle
Competition. More on this bike later. Nice photo, too!
(Photo courtesy of Peter Sharp)**



**Don Latarski's Moulton-recumbent conversion
(Photo courtesy of Don Latarski)**

THE EASY RIDER 3 TRIKE

ROBERT J. BRYANT

Publisher: The Recumbent Cyclist Magazine

We always welcome the opportunity to test new recumbents, especially those of the entry level variety. Recumbent trikes are generally rare and expensive, finding an affordable trike was a welcome change. We first became aware of the Easy Rider-3 through RCM reader Ray Warner. Most recently, we saw an Easy Rider-3 zooming through downtown Corvallis (OR.) last July when we were setting up for daVinci Days. The folks at R & D were very interested in having us review the Easy Rider-3, a few weeks later we finalized the details and the trike was scheduled for shipment.

Our test trike arrived on time by semi-truck, it was fully assembled in a specially built shipping crate. (The Easy Rider-3 will not ship UPS.) This type of shipping is very expensive (\$160 from Michigan to Washington), but very convenient for the customer. Within ten minutes we were riding down the road. The design intent of the Easy Rider-3 is a comfortable easy to ride trike, hence the name, Easy Rider-3.

The Easy Rider-3 was not designed to be world-class competition for the famous Burrows Windcheetah or Trice, but as a beach-path fun bike or neighborhood cruiser. With a ready-to-ride weight of 65 pounds, we would not be planning any 100 mile rides with the Easy Rider-3. Ten miles or so is more realistic. James Thompson, company owner agrees, the Easy Rider was meant as a recreational-fun trike.

The riding position is different from other trikes we've ridden. The seat is fairly low, 17" from the ground and the position is fairly upright with your arms and legs are extended forward. The handlebars are somewhat of a reach and the "one-size-fits-all" frame would probably not fit riders taller than 6'2."

TRIKE GEOMETRY

The trike has an interesting steering

geometry. It has the sharpest turning radius of any trike (or two-wheeler) we've ridden. You can turn this trike so sharp that you are just pivoting on your inside rear wheel while riding around in a circle. This chopper-like feel makes the trike maneuverable, however, a degree of caution is in order. When the front fork is turned too far, it can skid you to a stop. The 65 degree head angle is responsible for the fork-flop. (Fork-flop is a where the front fork does not track straight-forward, but falls to one side or the other. Many recumbents have varying degrees of fork flop—which is not necessarily bad.) The Easy Rider-3's fork will "flop" three inches (from center) when turned to either side.

The ride of the Easy Rider-3 feels stable at recreational riding speeds of less than 15 mph. Control is good as long as you don't try riding with no hands. The layout of the Easy Rider-3 offers a lightly loaded front wheel. This enables you to pop one-wheel drive, right-turn-spinning "wheelies," this is a most interesting feature. We are not concerned with the unconventional steering geometry. We found these handling traits to actually increase the Easy Rider-3's fun-factor. Parking lot racing and low speed maneuvers are what this trike was built for.

FRAME

The main frame tube is made from 1-7/8" mild steel with one major bend. There is no front derailleur (or der. tube). The frame is MIG welded. The metal work is not beautiful, like some \$2000 custom built recumbents—but it is functional. Everything is over-built: simple, heavy and strong. The frame on our test trike was red-powdercoat, which is the only color choice. The seat has a steel frame with upholstered seat and back cushions. We found adjusting the seat to be time consuming, a quick release system would be a welcome addition. Our trike seat had an unusual white with black polka-dot (dairy-cow pattern) seat cover which complimented the trike nicely (honestly!).

COMPONENTS

The components are inexpensive and durable. A single piece steel crankset with matching pedals. The drivetrain is Shimano Tourney six speed. Our Easy Rider-3 had the optional 18-speed. The Shimano six-speed is complimented by a Sturmey Archer (ours had a Shimano) three-speed internal hub gear used as a triple crank. The hub gears offer a 25% reduction, a 1:1 lock-up and a 33% increase in gearing. With the 44T. front chainring and 14-32 rear freewheel, the gear inch range

Easy Rider 3 Specs

Trike Weight:	65 pounds
Wheelbase:	56"
Track width:	32"
Seat height:	17"
Drivetrain:	18 speed via 3 spd. hub X 6 spd der.
Brakes:	Two side-pull calipers
Wheel size:	3 X 20" X 1-3/4"

was 23-93. We would suggest slightly lower gearing for the Easy Rider-3. We would replace the 44T. with a 40T. or a 42T. For the type of riding this trike is designed for, six speeds should probably be enough—unless you need to climb hills.

The trike's precision bearing differential/ rear axle is manufactured by R & D Tech, as are many other specialty parts. We found R & D's fabrication quality to be excellent. The Easy Rider has one-drive wheel, but a posi-drive (two-wheel drive) version has been built. The wheels and freewheel are held in by 3/16" pins which can be punched out if removal becomes necessary. The rear tires can be changed without wheel removal and the single front wheel is quick release. Our Easy-Rider-3's drivetrain was very durable and was 100% trouble free during our test.

BRAKES

We found the brakes to be the weak-point on the trike. The Easy Rider uses two alloy side-pull calipers. One is mounted on the front fork and the other on the left rear wheel. They seemed mushy and ineffective as we could not get either brake to lock-up. The bottom line is this trike needs a brake upgrade. Gaylord Hill of CycloPedia suggested mountain bike brake levers and 2 mm inner wires. We would also add upgraded (lined) brake housing, good quality BMX calipers and Kool Stop or Aztec aftermarket brake-pads. This should remedy the problem for most recreational riders.



The Easy Rider 3
(Photo courtesy of R & D Tech)

PRODUCT COMPARISONS

The R & D Easy Rider-3 currently has limited competition in the marketplace. The only Trike we found with similar pricing was the Tri-Com from Angle Lake Cycle in Seattle. Comparable trikes up the price-scale are the Ryan, which is not yet in production and the Earth Traveler (\$2200+). Watch closely in the first quarter of 1993, as we are anticipating introduction of the new low-cost ReTrike from ReBike.

The R & D Tech Easy Rider-3 is a great value in the entry-level recumbent market. This trike is a whole-lot of fun to ride. All of the dozen or more people who rode it during our review found the trike very easy and fun. We

had the most fun racing it around the neighborhood, riding down the sidewalk, chasing the kids on their Big-Wheels or doing dough-nuts in the driveway. We had day-dreams of how much fun this trike would be to ride on ice or snow. Easy Rider trikes would be perfectly suitable for flat-land commuting or short trips. Easy Rider trikes are sold manufacturer-direct only. Prices start at \$599. Our test trike had the performance options, which include: with alloy wheels, 100 psi tires and 18 speeds. Price as tested \$799+ \$160 shipping, or \$959. For more information contact: R & D Tech Corp., 411-N. Division, Ann Arbor, MI, 48104. Phone number 1-800-968-2450, recorded product information, FAX (313)665-0334

EASY RIDER-3 STRONG POINTS:

- GOOD PRICE-POINT (\$600-\$900);
- HIGH BANG FOR THE BUCK RATING
- EXTREMELY DURABLE

RCM RECOMMENDS:

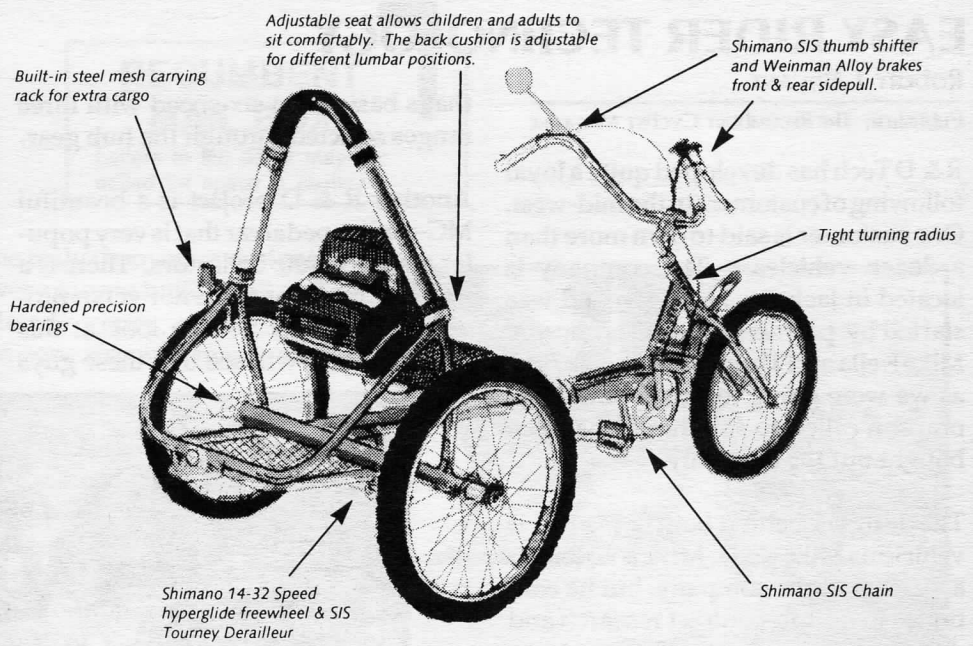
- A SIMPLER QUICK RELEASE SEAT ADJUSTER
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- BETTER BRAKES
- MAKING THE TRIKE UPS SHIPABLE

"This tricycle is faster than it might look. I can hold 10-15 mph and have no trouble riding with two-wheelers. Our club has two different classes, with my two wheeler, I rode with class-B, with the Easy Rider-3, I just dropped back to class-C. The comfort of riding this recumbent is so great, that I would never go back to a standard bike."—RCM Reader, Ray Warner



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THE R&D EASY RIDER 3 & 4 WHEEL RECUMBENTS

THOMAS A. STACHNICK,
FORMER VICE-PRESIDENT, R & D TECH

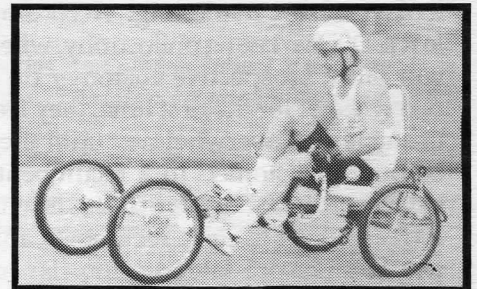
R&D TECH, has a new 4-wheel bike that handles and feels just like a sports car, and it should, because it was developed to be the chassis for a series of 1/2 scale pedal cars for adults.

It has a swing front end that allows it to ride over uneven surfaces without lifting a wheel off the ground. It also has an underseat steering system that uses swivel ball rod ends to connect steering linkages.

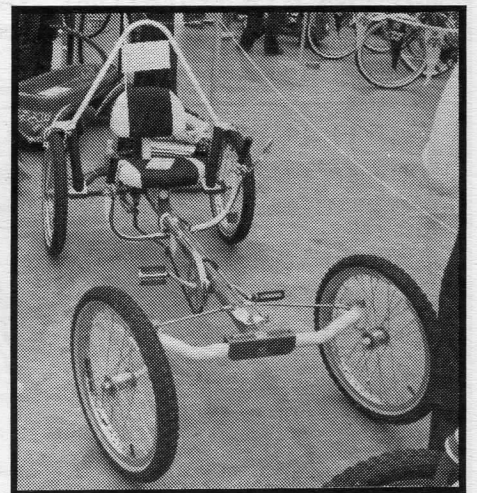
The most exciting development at R&D TECH is our drive system. Both the trike and four-wheel bike use the same index shifting system they are available as six-speeds or with a different twist. We run a short chain from the front sprocket to a three-speed Shimano(internal) hub gear and another short chain from the Shimano three-speed hub to the six-speed free-

wheel to create an 18-speed bike. The advantages of using the three-speed hub instead of a front derailleur is that you can shift into a lower gear while standing still. This works especially well at a red light. Using two chains instead of one long one also eliminates annoying chain bounce that occurs on long wheelbase recumbents. The system also makes the derailleur more responsive.

We are also building our first model of an adult recumbent pedal car, which is a 1/2 scale 1956 MG using our new four-wheel chassis. This pedal car will appreciate in value as a collectable because only 150 cars are planned in this body before we go on to the next car. The body will fit over our trick 18-speed chassis. The MG will be offered as a kit with a steering wheel and a three-speed coaster brake hub to meet its aesthetic requirements, and is more of a collectable than a serious commuter vehicle.



The 4-wheeler Chassis in action
(Photo courtesy of Mike Eliasohn)



The R & D Tech 4-wheeler Chassis
(Photo courtesy of John Riley)

EASY RIDER TECHNOLOGY

ROBERT J. BRYANT

PUBLISHER: THE RECUMBENT CYCLIST MAGAZINE

R & D Tech has developed quite a loyal following of customers in the mid-west. One customer is said to own more than a dozen vehicles. The company is located in Jackson, Michigan and was started by partners: James Thompson, Mike Kella and Thomas Stachnick. Just as we were going to press, James Thompson called to say that he had just bought out the company.

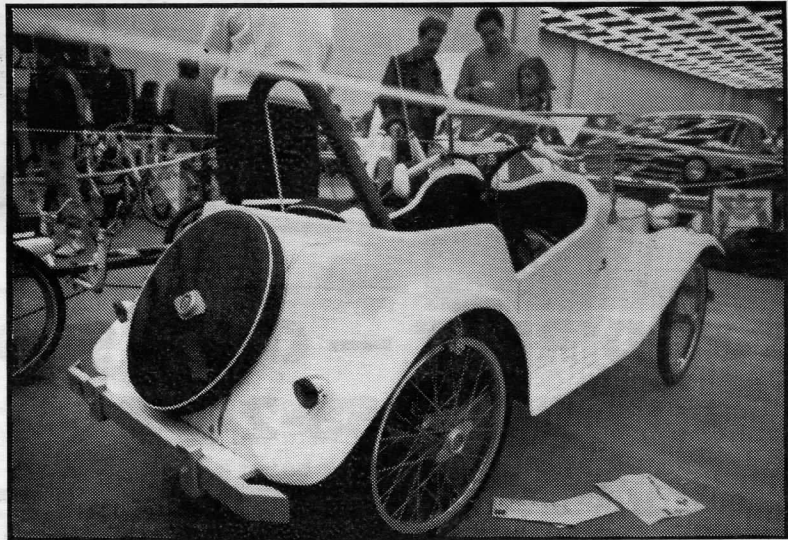
The designer behind both of the R & D vehicles is Mike Kella. Mike is no longer a partner in the company, but he continues to do sub-contract research and design. In our conversation, Mike mentioned the building of several prototypes and different design layouts dating back to when he first viewed the movie "Brainstorm," in which one of the stars was an Avatar recumbent.

R & D Tech settled on their current design for one simple, yet often overlooked reason, marketing. According to R & D's marketing philosophy, when you put a prospective customer on a two wheeler for the first time, they feel unstable and overwhelmed until they become accustomed to a recumbents balance. R & D's idea is that this is why it takes longer to sell a recumbent and why so much pre-sale education is necessary. With the trike, it is climb on and go. After a minute or so, a very large smile is on the riders face. The drivetrain is even simple, an 18-speed

that's basically a six-speed with three ranges selected through the hub gear.

Another R & D project is a beautiful MG-replica pedal car that is very popular amongst auto collectors. There is a great demand for these not-yet in production vehicles. One look at this body and you will see that these guys

in 20 minutes, versus five-six hours for fiberglass. Euralon was invented for the RV industry. According to R & D, it is used in motorhome roofs. Euralon is not as brittle as fiberglass and has some of the characteristics of nylon, as it flexes a bit. For motorhome roofs, it allows the air conditioning mechanics to climb on the roofs without damaging them. For HPV use, the fiberglass



The R & D Tech MG Replica pedalcar
(Photo courtesy of John Riley)

also have a knack for composite work. As it turns out, they are also the sub-contract builder for the reintroduction of the Bowden Spacelander collector bike that will sell for \$3000+.

Mike Kella explained about a new hybrid polymer technology called Euralon. It is similar to fiberglass, but parts are ready to come out of the molds

MG body weighs 28 pounds. When built of Euralon, it weighs only 18 pounds, a weight savings of 35%. One of the large recumbent manufacturers has approached R & D to build recumbent bodies. Bodies for all the R & D vehicles are on the drawing board. If this isn't high-tech enough, R & D is working on an electric assist unit for the Easy Rider trikes.

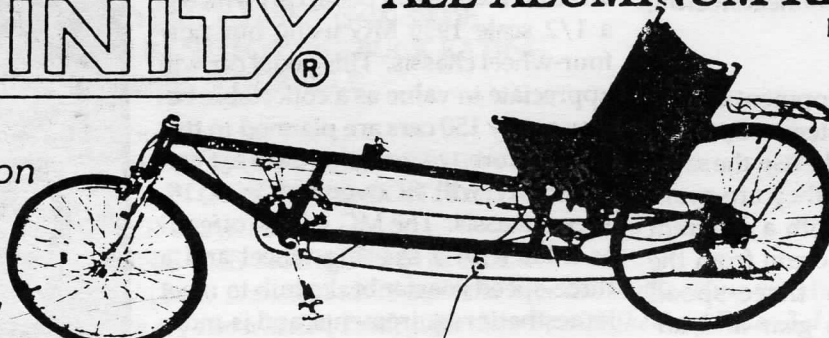
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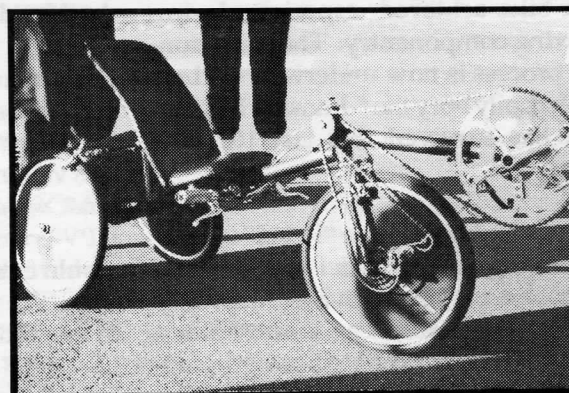
Letters to the editor may be edited for space & clarity.

Dear Mr. Bryant,

We are currently working on some truly innovative designs, a front wheel drive SWB bicycle, a very easy to build LWB and a cheap and easy trike. I have already given a copy of the drawings of my trike design to someone else who may build it. We shall see.

I was glad to finally meet you in Yreka. I am sorry I did not have the chance to become an RCM Crew member. I was camped at the airport and too involved in studying vehicle designs to think of much else. I thought that your Underground HPV Times was a great idea. I have one slight correction to make regarding the SWB front wheel drive trike with the Moulton wheels. This trike was actually designed by Paul Smith of Vancouver, BC and built by Georgi Georgiev. Mr. Georgiev also had a trike of his own design based on his racing arm powered trikes. He is a master designer and deserves more recognition. Thanks for the great publication.

Sincerely,
Kevin Haupt
9027 Hubbard St.
Culver City, CA 90232



The Paul Smith/Georgi Georgiev Trike
(Trike photo courtesy of Kevin Haupt)

Kevin, thanks for the letter & we stand corrected. We also have done some research on this neat vehicle, in fact, a member of the RCM Crew has ordered one from Mr. Georgiev who will build them on special order. The latest version will have three hub brakes and 20" wheels. Also, please keep the home-builder articles coming!-Ed.

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Dear Robert,

It must be pleasing to see your magazine growing and expanding so well. I think you are riding the crest of what will undoubtedly turn into a tidal wave! Recumbent bicycles are set for a "Quantum Leap" in popularity taking advantage of the small hope that the mountain bike achieved, especially in improving componentry. The evolutionary process is now underway and we can happily bury the "dinosaur bicycle" that has survived this last 100 plus years.

Thanks for keeping the "Rebel" in your product guides. Rebel Cycles have been on a very intensive evolutionary path over the last year, resulting in a MWB of simpler, lighter, stiffer structure with easier low cost production features. Comfort and performance are way ahead of the old SWB model and braking safety is now unbelievable with alloy hub (drum)brakes. Never will I ever use rim brakes again. They are hideous contraptions that need to be buried with the dinosaur bicycle they inhabited.

A tandem is on the drawing board and

should be mobile by the end of this month, employing the same construction methods of the new MWB machine.

Thanks again for your continued support,
Tony Woodroffe
Auckland, New Zealand

P.S. I read Steve Sussman's letter in RCM#12 and would like to extend an invitation to any recumbent enthusiasts visiting N.Z. to stop in. You are all most welcome. There are other N.Z. HPV'ers throughout the country who would extend the same invitation I am sure. We are starved for HPV contact in this little country of ours.

Dear Robert,

I have been subscribing to your magazine for almost a year now and It has opened up a whole new world for me. I am a bike rider for fun and recreation. I have always had a bike, usually a garage sale specials or recycled from trash. I wanted to get a recumbent but they were too expensive for me. I finally ordered a frame-kit from Ed

Roeters (Alternative Bikestyles), I then bought a used 5-speed for \$20. I put the bike together and now ride it. I painted it with primer (spray-can) and now ride it everyday. People ask, "what is that?" I tell them how easy and comfortable it is to ride and about your wonderful magazine. This is the most fun I've had in my life! You are doing a great service by giving people so much information for people to learn about the bikes of the future. I read it from cover to cover. The home-built articles are great. If the authors would only include more sketches and dimensions it would be very helpful for us (66 year-old) beginners.

Thank you
Pete Lardo
PO Box 1834
Flagler Beach, FL 32136

Pete, thanks for the great story. By my estimations, you probably have a Maverick that cost around \$200, what a great deal! We suggest shopping around for a 6-spd. BMX bike at your local bike shop, Discount or Department store. We found them for as low as \$99. This would mean a \$250 recumbent. -Ed.

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THE FLEETWOOD
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Dear Robert,
 Bravo on RCM#12. This is, perhaps your best issue yet. I want to say that Steve Sussman's letter about touring with an Easy Racer is right on the money. I recently completed my first coast-to-coast ride and discovered many of the same things about touring that he did.

Weight is truly an over-rated concern. I didn't carry the kitchen sink, but almost everything else was packed onto the "Albatross" for our trip. It's penny wide and pound foolish not to be self sufficient on the open road. The piece of mind I experienced from carrying a few things which I might never need out weighed whatever extra effort was required to pedal it.

Unlike Steve, I used a 48 spoke wheel from the beginning. It survived slamming into canyon sized potholes, and being run off the road by a brain-damaged trucker without breaking a spoke or becoming a millimeter out of true. (Marv Watson from Off-The Beaten Track in Lansing MI. built the wheels.)

But the real star of our journey was the Tour Easy; its performance and handling with bags on the front was superb. When my friends were sometimes struggling with their heads brought down by winds and fatigue, I was cruising along enjoying the scenery. (Maybe that's why I hit those damn potholes!) Sure, I was the last one up the mountains, yet never more than a couple of minutes behind even the strongest rider. Coming down, however, was different story. The recumbent position, and being able to "lead with your feet instead of your head" gave me the confidence to let the Albatross fly! I passed everyone going downhill at speeds of 45-50 mph.

The only thing which could have made the trip better was having less rain and more sunshine; this truly was a "year without summer." but for all that, I'm glad I made the trip and even more glad I did it on a recumbent.

Sincerely,
 Jerry Frezon
 701 Frazer St.
 Owosso, MI 48867

TransAmerica '92



The HPV Times

Dear Robert,
 I absolutely loved The Underground HPV Times! Of course, when HPV News publishes my actual race speeds, my celebrity status as a "World Class Competitor" will come to an abrupt halt. Until then, I intend to publicize The Underground HPV Times to the hilt!

Viva Recumbent Cyclist!
 Gerry Pease-Lightning F-40
 Manhattan Beach, CA

Greetings RCM Crew,

I just received my mail (forwarded) from the states that included Vol. 1 #1 of the Underground HPV Times.....BRAVO! About five years ago when I was an IHPVA Board Member I proposed a marketing arm for the IHPVA. It warms my heart to see that you have taken the lead with three stars going to Bryant and his Editorial License page. The U-HPV TIMES also warms my heart and I wish you the best of luck with it!

Keep it rolling
 Matteo Martignoni
 IHPVA Vice Pres.

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DOCTOR_x RECUMBENT ©

The RCM Crew answer your recumbent questions



Dear Dr. Recumbent,

Is there any such animal as a short wheelbase with a low bottom bracket? I've noticed that one factor involved in the comfort that any particular recumbent design affords me is directly connected to the height of the bottom bracket in relation to the seat.

I realize that the high bottom bracket is necessary for prevention of interference with front wheel steering and that weight distribution is a consideration. Still I wonder if it's possible to build a good design with front steer, rear drive SWB and low B.B.

Obviously, decreasing the diameter of the front wheel is a way to allow for lower BB. What is the trade off? What are the effects of smaller front wheel diameter?

Michael Brisson

Dear Michael,

This is the basis of designer Milt Turner's Laid Back theory. You are correct in thinking that you need to use a 16" wheel on a low-B.B. SWB. Some enthusiasts swear by small wheels. The only problem we see with the 16"/17" wheels is the lack of a good affordable tire. The Michelin was the best, at 65 psi, CycloPedia is very enthusiastic about this wheel size. We feel that the 45 psi Golden Boy brand of tire is NOT adequate for a high-performance bike; however, you always have the Moulton, at \$55-\$130 for a tire and tube. The Moulton takes a special 17" rim and they come in 100 psi and 130 psi. At \$375 for a square-tube frameset, the Laid Back E is a good value in the SWB market. Finding all the necessary parts and building the bike from the frameset can be time consuming. The new 2000 is a gorgeous bike, the nicest (most expensive) Turner bike we've seen. It has a natural gold Keolar seat, new chro-moly fork and bars. He recommends SunTour Micro Drive with a 700c rear and a 16" front. You can expect to have about \$700-\$900 into your "E" if you build it with components as outlined in RCM#10. The 2000 frameset alone costs more than this.

The seat-height factor can only be solved by going to a small 16"/17" wheel. For tall riders, the seat-height factor is not as much of an issue, for shorter riders it can be a major-factor.

One more 16" note: the 16" X 1-3/4" size is a very popular kid's bike and bike trailer size. Steel bolt on wheels are READILY available and ultra- cheap. Aluminum rims for this size are also hard to get as are hi-psi tires. By the way, this is ReBike size. They have special matching tires in 20"/16" that are 70 psi! All we need to do is find out where they come from.....Taiwan somewhere..... Dr. Recumbent

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Dear Dr. Recumbent,

More and more rail-road tracks are being converted to trails. They are usually dirt or gravel surfaces and not paved! Which recumbent bike would you choose to ride on these surfaces where vibrations, mud holes and gates to keep out motor vehicles are frequently encountered.

Christopher Reed
Arlington VA.

Dear Christopher,

Thanks for the excellent question. We have been considering the idea of a low cost Winter-bike as the bad weather sets in. In RCM#4, Nick Mattoni showed us his offroad Laid Back Jr. The Jr. was a ultra low budget recumbent that is no longer made (the new LB-E is the upgraded version of the Jr.) Nick's bike has a 24" fat rear tire and a 16" X 1.75" front tire. This is the only offroad recumbent that we have seen. Here are the traits that we would like to see in a hybrid/ cross recumbent bicycle:

- a. A MWB-LWB frame. Preferably a shorter LWB with low B.B. height. The shorter LWB will offer more predictable handling over rough and uneven surfaces. A SWB could be used as in the "Jr.", but the small and heavily loaded front wheel may cause problems. The SWB benefits include a low c.g. and seat height. The SWB would still not be our choice.
- b. An over-built steel frame with a mix of BMX grade steel components and low, low gears.
- c. A 20"-26" rear wheel with a fat tire such as a Avocet Cross, Tioga City Slicker or even a cross knobby would work. A 20" front with an ACS RL Edge or other semi-knob tire. These are readily available for BMX bikes. We also like bolt-on wheels, as the axles are stronger than inexpensive quick release types.
- d. Upright handlebar steering. Why? More control over uneven terrain. Under seat steering could get in the way when bike trail motor vehicle gates are encountered or if you should lose your balance.
- e. Suspension? Some sort of suspension, sling seat or a extra foam into your foam/ hell eat may be a good idea. Fat tires with lower air pressures and rubber mounting on your seat are the cheapest forms of suspension. Adding a Presto / ATP R-20 elastomer bumper seat or rear swing arm suspension would be the expensive way. Redline, Spectra and Murray (sold at discount stores) offer 20" suspended front forks. We have seen them priced from \$98 for the entire Murray BMX bike to several hundred dollars for a ProForx 20" fork.
- d. Wheels, two or three? A three wheeler, if tough enough, will solve the balance problem, but two wheel is always more convenient.

Our picks for the ultimate Hybrid/ Cross recumbent. We would like to offer two choices. Here is what we would do:

Choice #1: A Hybrid/ Cross Trike, a R & D Tech Easy Rider 3 or the long awaited and upcoming ReTrike (from ReBike in Boca Raton, FL.) would be perfect. They are overbuilt, tough, easy to ride and extremely maneuverable. We would order it exactly the way the RCM test bike was set up except with stronger brakes.

Choice #2: An Alternative Bikesstyles Harmony. This is a new low-top tube version of Ed Roeter's bargain-hunter special Maverick LWB. We would build it with two 20" alloy wheels, ACS RL Edge or other BMX type semi-knobby tire, a wide range 12 speed. drivetrain with a 13-32 freewheel and a 42/52 crankset offering a 26-80 gear inch range. We would shock mount the seat with a flat piece of rubber and/ or use a thick layer of foam on the seat base. A bike such as this could be set up for under \$500 if you are on a budget. You may want to cannibalize a 6 spd. BMX bike for parts. You may be able to get it under \$300 by doing this by ordering your frameset without powdercoat paint and using a spray an "flat-lack" paint job would be suitable and preferable (see Flatblack BMX conversion RCM#9, Mark Colliton).

Choice #3: Upgrade the bike you have. Get a second set of wheels with fat-low psi tires with bolt on hubs (possibly with drum brakes) and be very gentle with your beloved bike). If you can afford it, the ideal situation would be to set up a bad weather/ winter/ Cross recumbent.

-Dr. Recumbent ©

Send your recumbent questions to: Dr. Recumbent c/o RCM
"DOCTOR_x RECUMBENT" is a copyrighted column of the Recumbent Cyclist Magazine.)

DR. RECUMBENT: A PRESCRIPTION FOR CONTROVERSY

The original idea for the "Dr. Recumbent" column was a chance for readers to ask questions about recumbents and related subjects. We have received many letters and positive responses, so we assume the readers like this idea too. Recently, we received one letter from a disgruntled reader who claims that he alone is uniquely qualified to be called Dr. Recumbent, with qualifications including: a PhD, 20+ years of studying recumbents, previous use of this nickname, and the fact that he is a REAL doctor made him uniquely qualified for this nick-name. The letter *insisted* and *demand*ed that we (the RCM Crew) were not qualified to be "Dr. Recumbent" or write a column called "Dr. Recumbent."

The idea for this question and answer column dates back to the inception of the Recumbent Cyclist. You may have noticed that nobody signed "Dr. Recumbent" in RCM#12? This is because the question & answer column will be done by whomever is qualified to do so. Maybe Robert, one of our RCM Crew Ace Reporters, a recumbent manufacturer, designer, engineer or dealer. Our new column will include replies from the most brilliant minds in recumbency. We (the RCM Crew) have actively studied recumbents for several years and probably have more published material than anyone on this subject.

The following are reader responses

from the "GENie On-Line Recumbents & Cycling bulletin board" where "Dr. Recumbent" has been a topic of conversation as of late.

THE REAL RECUMBENT DOCTORS PRESCRIBE FUN:

Apologies to - whatshisname- for any confusion that the usage of *Dr. Recumbent* may have caused him by the heading in this column. It is used here with the sole intent of addressing reader problems/concerns in an open forum just as all other periodicals directly responding to their readers. Every word in the RCM has been used by someone somewhere before—"Dr. Larry."

No doctor? No problem. Let's see...(recumbent) Ayatollah, Czar, King. How about Pope? Oh, sorry. That is how Sinnéad got in trouble. Ah...The Elvis of recumbents ... ah. Dr. Recumbent PhD. Captain Jean Luc Recumbent. Dr. Hunter S. Recumbent. Reverend Recumbent. (I am sure there must be one of those somewhere). Ok, so maybe it will take some work.—"Dr. John." *The sixties must have been good to Dr. John, the Recumbent Elvis!—we love it!*

Dr. Robert...let's see... I am also a "REAL" doctor, and I ride recumbents, and therefore I am also *authorized by divine right* to the title "Dr. Recumbent," at least according to the logic of your buddy. Therefore, I am pleased to bequeath upon you MY rights to the

title...with my blessing and consent...
"The Real Dr. Jim"

Dr. Robert,
My ditto on Dr. Jim's reply.This Doctor stuff is the worst so far. I'm through with it. Equal time for nurses now. They're much better looking and more fun to talk to or about! Nurse 'Bent?
Bye..... "Dr. Infinity."

Dr. Recumbent, I see about 100 patients a week, so I guess I-R-1-too, and I sure find no problem with your title. What I do find a BIG problem with is that this guys ego has gotten this whole matter splattered all over the country! The consensus seems to be in—we like Dr. Recumbent and he are YOU! There would be a different situation if you had an opinion and most of the population was against you. What we are talking about here is one reader vs. the rest of the world.Don't submit to terrorists and bullies anymore. Public opinion is with you, go for it. Just my opinion..... It's your paper, write it your way, I love it. I have just finished reading all 12 issues in the past two weeks. Only problem is I WANT MORE !!
—"The Real Dr. Tom."

Doc, Doctor, Herr Doctor, Herr Professor, Mr. Diagnostician or "whatever-Bryant": as another "REAL" Dr., I second Dr. Jim's motion and *hereby bequeath upon you the privilege to call yourself Dr. Recumbent, or anything else for that matter.* You seem to be able to diagnose and treat many of the recumbent problems and ailments that are presented. "The Real Dr. Jay".

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What can we say, the readers have spoken!, long live the Doctor! DOCTOR, RECUMBENT hereby bequeaths and honors all of the above fun-loving, laid-back recumbent riding enthusiasts as "Doctors of Recumbency from the Recumbent Cyclist College of Learned Recumbent-Knowledge." You are now members of the RCM CREW! If you too, would like to be part of the RCM-Crew, log-on to the GENie computer network and enjoy a weekly on-line version of RCM!

RCM INFORMATION

The Recumbent Cyclist Magazine is dedicated to promoting recumbent bicycles and providing and encouraging communications between HPV enthusiasts, home-builders, dealers and commercial manufacturers of recumbent bicycles.

SUBSCRIPTION INFO: The Recumbent Cyclist is published six times per year. To subscribe to the Recumbent Cyclist, please send \$22.95 (bulk-rate-USA), \$29.95 (First Class mail-USA) and \$29.95 Canada (US funds) and \$39.95 (US funds) International Subscription. The First class subscription will get you your issue 2+ weeks earlier than the standard rate. We are closing out the old RBCA patches and have a few left at \$2.50.

NEWSLETTER SUBMISSIONS: We want your photo's, letters, stories and recumbent information for publication. Send a story/ article about your bike and please don't forget a picture. Print your name on the back of anything sent to the RCM office so we can credit the source. If you can send your submission on computer disc, we use an Apple Macintosh (Microsoft Works 3.0) that will read IBM 3.5" discs in ASCII format only. If you don't have a computer, we will take it in a letter form or whatever.

Please send submissions to:

NEW ADDRESS:

The Recumbent Cyclist
PO Box 58755
Renton, WA 98058-1755.

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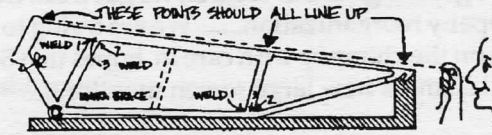


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EDITORIAL LICENSE:

by **ROBERT J. BRYANT**

RCM Publisher

Welcome Recumbent Cyclists, we apologize for the delay of "RCM#Lucky-13," which has so far been our most trouble-prone publication thus far. The story goes like this..... T'was the month before Christmas, when all though the RCM office, not a creature was stirring, not even an icon or init and especially not our Mac hard-drive—which bit the dust, taking with it thousands of pages of RCM information. Luckily, we had (most) of the files backed up. This has added almost two more weeks to our already month-late issue number "RCM # Lucky-13." Just as we started to get things under control, we got a call from James Thompson, the NEW owner of R & DTECH—with news of a company reorganization..... We are trying to limit our naughtyness and TRYING to be nice. Our stockings will be hung on the chimney with care in hopes that St. Mac will bring us a new Ici which is 6 times faster than our old system.....and a new large screen monitor....

Hopefully, it isn't much past Christmas—no, better say New Years, well maybe mid-January— as you are reading "RCM#Lucky-13"..... Happy Holidays from the RCM Crew.

F.Y.I

RCM#14, our next issue will be the 2nd Annual
"RECUMBENT CYCLIST BUYERS GUIDE."

If you are planning to build & sell recumbents in 1993, please put together a package of information to send off to RCM ASAP! Issue deadline is January 1993. If we do not here from you, your bike may be left out.

MEDIA WATCH: CNBC STEALS & DEALS: This cable show did a segment on recumbents featuring stars like, *Kathie Skewis and the ReBabes, Milt "Mr. Laid Back" Turner, Dr. Ross and his Gold Rush Replica and Tom Howe on his Lightning F-40.* We cooperated fully with CNBC and they promised to show a copy of RCM and give out our address. Well, they must have forgotten. Anyway, a handful of detective recumbent enthusiasts were able to get through to us. Everytime we speak to media folks, we try to convey that they must offer interested readers/ viewers a place to turn for more info as local bike shops won't do it. We appreciate this type of national coverage as it can only help the recumbent-cause. (Watch for more information on the ReBike 707 and the "ReBabes" in RCM#14.) Media blunder of the month goes to "GQ Magazine," who mentioned recumbents in a new products format. They showed a picture of an Infinity, but listed Linear's name, address & phone. The US News article has been picked up by Gannet News service, many newspapers, airline magazines and we still get inquiries from the July 6, 1992 US News article.



The Whittier Grand Prix Lightning F-40 racers
(Photo courtesy of Lightning Cycle Dynamics, Lompoc, CA)

NEW ADDRESS—AGAIN! We have had so many complaints about our address being too long and hard to remember that we now have a new one. We will keep the old address for a year while we convert. Please send everything but UPS deliveries to this new address:

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RECUMBENT CYCLIST CALENDAR

FEBRUARY 27 & 28th 1993: SEATTLE BIKE EXPO

SEATTLE CENTER NORTHWEST ROOMS-We will not have a booth at this years show, however, Angle Lake Cyclery and A.T.P. will be in attendance. Bring your recumbent and park it in the bicycle parking area. The RCM Crew will be hang'in out, in the parking lot, of course.

FEBRUARY 29TH, 1993: CHILLY HILLY

A NW ride put on by the Cascade Bicycle Club. If you'd like to go, or talk about the NW rider group, call: Stewart Delaire at (206)692-9738.

AUGUST 1993: INTERBIKE 1993

LAS VEGAS, NEVADA-North America's Premiere bike show.

AUGUST 1993: 1993 INTERNATIONAL HUMAN POWERED SPEED CHAMPIONSHIPS

MINNEAPOLIS, MN. Tentative. The MnHPVA is the hosting HPV Club. Their address is MnHPVA, 4139 Brookside, St. Louis Park, MN. 55416. They are charging \$5 to keep you posted on the upcoming event. If you get some news, please send it our way too.

RECUMBENT HAPPENINGS

GOLD RUSH SPEED RECORD BROKEN BY TEAM CHEETAH:

At 6:55 PM on September 22nd, 1992 the Cheetah streaked to a new 200 meter world record of 68.73 mph (110.62 kph). As required by the International Human Powered Vehicle Association, there were two IHPVA members present at the event to act as official observers. One was Robert Sainato of Ft. Collins, and I was the other.

The location was the San Luis Valley, near Great Sand Dunes National Monument in Southern Colorado. This place was made for HPV speed runs. It was generally clear and calm both mornings and evenings, and the high altitude meant less air drag. The road we used had pavement less than two years old, and was completely straight. Grade was well within 2/3% specified in the rules.

On Tuesday morning, Chris made a 63 mph run, but winds kicked up and we packed up and went back to camp. That evening about 6:00, Kevin called us together, and we decided to do the first evening attempt. Everything clicked! All equipment and personnel were in place by 6:40. We closed the road and rolled out the timing strips. The desert was incredibly still.

We were located at the timing equipment. The call came through to me by CB radio-Chris was rolling. The bike whooshed by, and I read the elapsed time of 6.510 seconds. I knew that any time less than 6.8 seconds would set a new record. Stunned, I called in the time to the crew, and soon the desert was no longer silent! After five years of work, including an unsuccessful attempt in 1990, Team Cheetah had set a new world record.—Reported by Brian Wilson

LIGHTNING F-40'S STRIKE AGAIN AT WHITTIER GRAND PRIX CRITERIUM: Whittier, CA.

This years Whittier Grand Prix bicycle races included one race for Human Powered Vehicles. In this 10-mile race, Lightning F-40's swept the top three places, and also took 5th and 6th. Here is of the top six finishers: 1st) Pete Penseyres; 2nd) Tim Brummer; 3rd) Greg DuVall; 4th) Tom Traylor (riding his Critical Mass FWD); 5th) Gerry Pease and 6th) Tom Howe. First place finisher Penseyres spent the first couple of laps getting used to the race-course, which he had never ridden before. He then proceeded to pull away from the pack on lap three, and lapped most of the field at least once. His average speed was an incredible 28 mph! He was also turning laps 10 seconds faster than the featured event of Pro-racers, riding in a pack on UCI bikes. Even more amazing, when compared to the UCI bikes, is the fact that these F-40's are used for daily commuting by their owners.—reported by Tim Brummer.

THE FIRST ANNUAL SOUTHEAST RECUMBENT FUN RIDE!

It began with a slight chill in the air. Temperatures were in the low 50s as the sun rose, but climbed comfortably into the low 70s. We had a good turnout with nine recumbents attending. The field was well represented by an ATP-20, a Linear, a Lightning P-38, two Ryan Vanguards, two Tour Easys, my Gold Rush Replica and our T-38 Lightning tandem. The P-38 sported a Zzipper Experimental fairing with a custom mount to the crank boom. One of the Tour Easys was a factory model, while the other was a plans built version with underseat cable steering.

We headed into the wind and began our excursion. As it was early in the morning, the wind was not as fierce as it could have been and we made good time to the first regroup and break point. Most of the riders were of even ability, so we were able to stay together.

Spirits were high and we decided to plunge into the wind and continue on the long route. Crossing from the peninsula to the mainland put a few more miles behind us as we headed north again. A long stretch of straight road with very little traffic provided a photo opportunity as my wife picked up the video camera and began taping from the back of the tandem.

Finally reaching the northern most point of the journey, we headed back on A1A, running along the ocean. The water was whipped into a maelstrom by the same wind that was now at our backs. The cycle computers were displaying speeds in the high 20s and perhaps into the 30mph range. This stretch of road was over five miles long and seemed to be one-tenth that distance with mother nature's assistance. We returned to the crossover point in no time at all. All of us were pretty psyched up by the fast downwind leg.

At the next regroup point, I discovered that the front tire of the T-38 was showing a bit of cord. A Florida mountain (high rise bridge) was between us and the end of the ride, so it was decided to replace the rubber. Another short break and we were rolling.

The bridge came into view and we attacked en-masse. The tailwind component now became a stiff 90 degree crosswind and had all cyclists weaving with the gusts. Bob went searching for an elusive lower gear that did not exist and dropped his chain into the rear hub. Restarting on the incline challenged his capabilities as a true recumbenteer.

Back at the parking lot, we shared rides on each other's cycles and examined the different designs. Barbara Brown had her ReBike, although it rode in the sag wagon. It was also given the "run-around" by the crew.

Barbara provided sag with the Brown family Suburban, filled with cookies, muffins, and fruit. Our thanks to her for this always welcome assistance. She also stood by at the turn points to make certain that the last riders were still with the group before moving on to the next stop.

The newly formed "Loose Assemblage of SouthEast Recumbent Riders" (LASERR) is looking for new routes and new members. Drop a line to Fred Ungewitter, 1964 Forest Avenue, Daytona Beach, FL, 32119. Also on the contact list is Bob Brown, 7811 Edgewater Drive, Lake Clarke Shores, FL, 33406, and Larry Wilkinson, 3069 Wilkinson Rd., Mt. Olive AL. 35117-9506.—reported by Fred Ungewitter.

THE FIRST ANNUAL SACRAMENTO VALLEY RECUMBENT MUSTER:

Has been declared an enthusiastic success. With over 45 recumbents/ HPV's and 65 people in attendance the turnout was triple the expected numbers.

The event took place at Hagan Park along the American River Bike Trail on October 25th. Enthusiasts came from all over Northern California with their bikes and ideas. Among attendees represented were four college HPV race teams, Easy Racers of Watsonville, Rotator Cycles of Santa Rosa, Elliptic Cycle of San Carlos and the event organizer, Introspect Cycle of Sacramento. The day was very casual with lots of time to check out each others bikes. Test rides and demonstrations were given by Introspect Cycle, Rotator and Elliptic Cycles. A representative from the Sacramento Area Bicycle Advocates spoke about bicycle advocacy in Northern California. Also the idea was thrown out about forming a Sacramento Valley recumbent rider group. People also had the opportunity to sign up for the Bay Area Recumbent Rider Group newsletter. Afterward, a picnic

was held and the judging took place. Two awards were given. The Best commercial built modified went to Tim Curtis and his "Clean Air Commuter," a Tour Easy with Zipper Fairing, hand built tail-fairing and full body stocking. The best home built went to "Sagitarius," a very cleanly built and finished SWB.

After the picnic and awards many people went on the bike trail for a scenic ride along the American River. The end of the day saw the last few riders "hanging out" in the park until just after nightfall. The camaraderie was great and the riders just didn't want it to end.

Plans are already being made for next year's muster with more events and possibly a separate Recumbent/HPV swap meet sometime during the summer. For people wanting more information or to be placed on the mailing list, call B.J. Strass at (916)481-2906.

Reported by B.J. Strass.



Tim Curtis and his Clean Air Commuter
(Photo courtesy of B.J. Strass-Introspect Cycle)

BREAKING THE SPEED RECORD

CHET RIDEOUT

Ft. Collins, CO.

Recumbent bicycles have been a hobby of mine for several years, but I've never attended races or events of the International Human Powered Vehicle Association, they've just always been too far away. Last month when I got a call from a friend asking if I could hope with a world speed record attempt right here in Colorado, I started packing my bags right away.

The attempt, I learned, involved an engineering team of Jon Garbarino, Kevin Frantz, and James Osborne, origi-

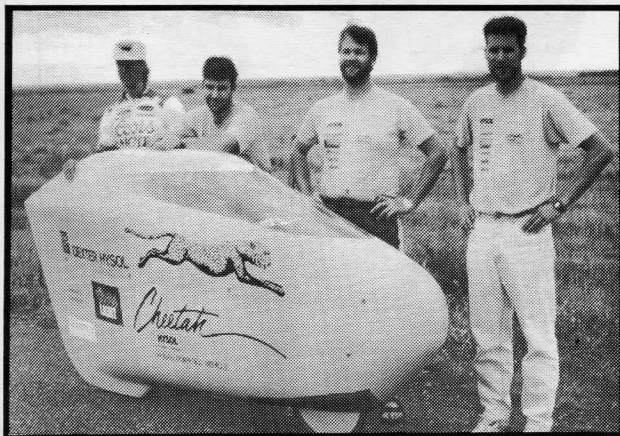
nally of U.C. Berkeley. Their bike, a fully faired carbon fiber recumbent, was called the Cheetah. An earlier version of the Cheetah, the Concept Z bicycle, placed fourth in the Sacramento ASME HPV race in April of 1988 with a speed of 51 mph near sea level. Last year, the Cheetah reached 61.5 mph on a 1.6 mile course at the airport near Bryce Canyon; the runway was too short, and the rider crashed when trying to stop. In our phone conversation, Kevin said they were going all out to beat the 65.48 mph record set by Gardner Martin's Gold Rush in 1986. The "power-plant" for the Cheetah would be Chris Huber of Coors Light Racing Team.

The location, in the San Luis Valley, was the La Garita Road. The site of several former speed attempts and records, it lies about 30 miles from the Great Sand Dunes National Monument. On a Friday afternoon I drove over passes glow-

ing with red and gold aspens, finally turning west toward the La Garita Trading Post at dusk. My first impression was that there was some mistake—this road was very rough, and I didn't want to push my car any faster than 50 mph!

When I met Kevin, he agreed about the road. IHPVA rules require that the road be almost exactly flat as shown by surveying, however, and La Garita was a legal route. At 7,600 feet altitude it also offers less wind resistance than roads at sea level. It had been, however, passed up by the paving crew this year. The bumpy asphalt was cutting into Chris's speed, even though he had been clocked at 61 mph earlier that day. Kevin and James checked out another road in the valley Saturday: They had surveying equipment and had found they needed 3-1/2 miles of straight, flat, smooth asphalt.

Back at camp the crew was busy. The weather calmed down in the afternoon enough for a run. Two men lifted Chris and loaded him on the bike, installed the top half of the fairing, and bolted it in place. Once inside he was in a closed air space. I got in my car, my assign-



The Team Cheetah: Chris Huber, Jon Garbarino,
James Osborne and Kevin Frantz
(Photo © Chester Rideout)

ment being to follow him from the rear. I shifted up into fourth gear and found that I wasn't gaining at all, even at 60 mph! Cross-winds picked up and the bike took a decided lean to the right side. Chris slowed drastically and coasted through the time trap. He slowed to a stop and two of the team members held the bike, lifted off the cowling and helped Chris climb out.



Inside the Cheetah
(Photo © Chester Rideout)

The engineering team made the decision to move, and in no time the crew was busy. In a few hours tents, bikes, road cones, surveying equipment, race personnel, and IHPVA observers packed up and rolled to the new camp at the Great Sand Dunes.

The bike, with its fairing, is really futuristic. With a high gear of 200", it utilizes a double chain loop. Two fairings have been made, the heavier being of yellow Kevlar and carbon fiber, and the lighter black carbon fiber except for the polycarbonate windshield. With the lighter fairing the Cheetah weighs only 32 pounds; lifting the fairing alone is like lifting a feather.

Once I saw the new road I knew we had a winner. The surface was excellent and finding a suitable flat stretch would be easy. In the evening, four of us measured, surveyed and marked 3-1/2 miles of pavement for the next morning's run. Kevin set a morning rising time of 6:00, established activities for each person, and we retired for the night.

Sunday morning was beautiful with practically no wind. We set up cones along the route, a 200 meter electronic speed trap, and we prepared video and still cameras. After a long delay,

three attempts were made at 55, 57 and 61 mph, but cross-winds affected the last two attempts. Probably the most amazing thing about the bike is to have a vehicle that can travel at that speed while making very little noise.

Up to this point the yellow fairing-two pounds heavier than the black fairing-had been used. On Sunday afternoon Jon Garbarino worked on the bike, preparing it for the addition of the black fairing. I reluctantly left for my home and job, leaving others to what would inevitably lead to a new world record.

On Monday my friend Dave Yust helped out, watching the Cheetah cross the line at 63 and 65.53 mph. Although this was faster than the world record it was too close. It was obvious that the great moment was imminent.

On Tuesday, September 22, the record was finally broken. At 6:55 PM Chris covered the 200 meters in just over 6 seconds at a speed of 68.73 mph! The design team were elated as their bicycle, the first form of which was designed in August of 1987, shattered the 1986 record. Hopefully their course in Colorado can be used for future attempts at further pushing this remarkable speed record.

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BRIAN WILSON

SANTA ROSA, CA

The Cheetah is a 29.5 LB. (13.4 KG) MWB recumbent with a carbon fiber box section frame, and carbon disc wheels. A Kevlar body was used during initial runs, but for the record run, a lighter carbon fiber body was used. The body was designed using software written by James Osborn. Horizontal cross sections through the body are standard airfoil shapes.

The designer/ builders are all recent graduates of U.C. Berkeley School of Mechanical Engineering. The rider Chris Huber, has a long history of criterium wins as a professional racer. He won the 1992 Nevada City Criterium.

Team Cheetah sponsors included high-tech adhesive manufacturer Dexter Hysol, Campagnolo, Continental and Supracor.

Special thanks to Chet Rideout and Brian Wilson for this major HPV-news breaking story.



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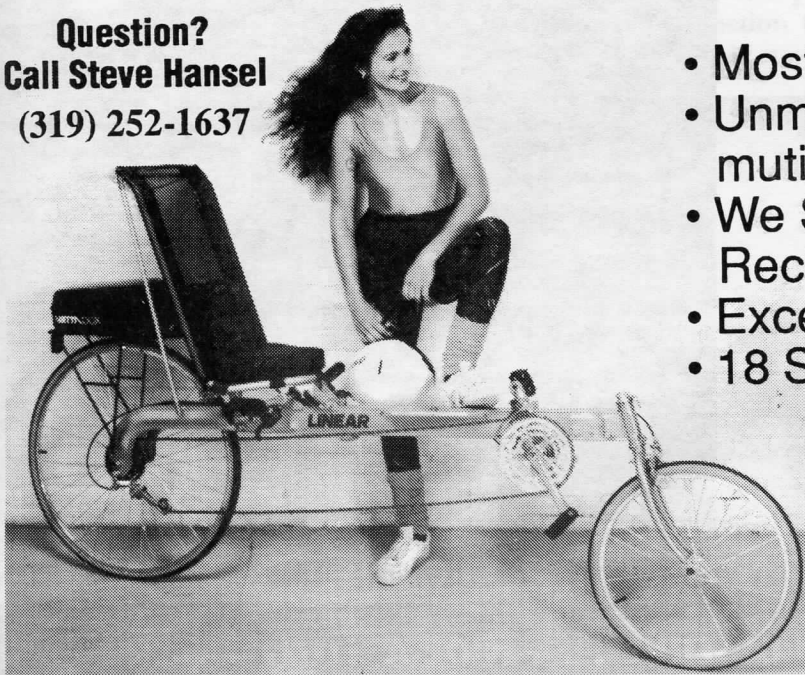
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HOMEBUILDER'S CORNER

THE PIRANHA MARK IV

STORY & PHOTO'S by KEVIN C. HAUPT & RICK FOWLER

In our last article we described the construction of a crude short wheelbase recumbent bicycle made out of old bike frames, electrical conduit and a lawn chair: the Piranha Mark II. After riding the Mark II for several months, we decided to construct a more refined bicycle out of lighter weight materials. This is the story of the Mark IV, or how not to build a one-off short wheelbase recumbent bicycle.

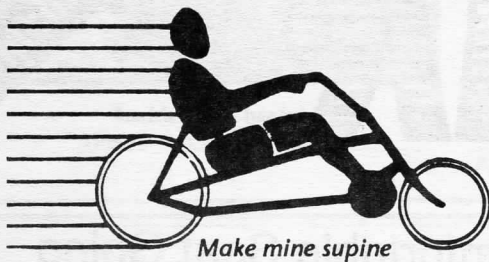
In order to find and correct mistakes in the design of the Mark IV, the frame was drawn to actual size on a piece of brown wrapping paper. In boat building, this technique is referred to as lofting. As a result of this process, several alternative designs were discarded because they did not work. Paper is much cheaper than chromoly tubing.

Based on our experience from the last project, an improved jig and simplified assembly process were considered part of the initial design. We most likely would have devised some of the same solutions as professional frame builders, but out trial and error research was much more interesting than visiting professional frame building shops.

Early on we realized how convenient it would be to have a flat surface to measure off of as an integral part of our jig. We took the "I" beam from our existing jog to a local engine machine shop for surface grinding. The man behind the counter thought this would be no problem. We would return in a few hours and pick up our soon to be flat "I" beam. When we returned, we were told by the machine operator that the "I" beam was much more difficult

to clamp into their head grinding machine than he had anticipated and that the grinder had actually dislodged the beam from the machine and propelled it across the room where it punched a hole in the wall. He only charged us ten dollars but the owner of the shop was very upset and thought we should be paying for repairs to the wall. Next we tried to get it "blanchard" ground, whatever that is, from a commercial surface grinding company. "No Problem," said the man behind the counter. Three days later he called and told us to come pick up our *#\$%&! "I" beam. It had chattered too much and he finally gave up on it after several hours work. at least there would no charge.

We then looked for an old cast iron milling machine table from a scrap metal dealer. We picked one of the



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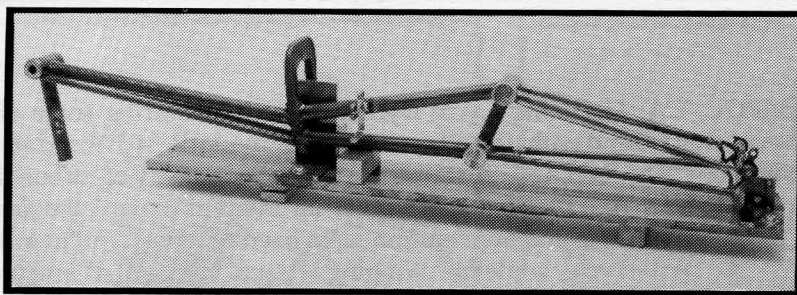


Photo 1: The Piranha Mark IV frame jig
(Photo courtesy of Kevin Haupt & Rick Fowler)

rainiest days in the history of Los Angeles to go slogging through the mud at the salvage yard. We found something that may have worked, but the owner decided to price it like gold rather than scrap iron. Finally we gave up on finding something flat and settled for a piece of cold rolled steel plate 8" x 40" X 3/4". It was nearly flat, varying by less than 1/16" over its length and width. The completed frame, mounted on the jig is shown in Photo #1. Please note that the frame is positioned upside down on the jig.

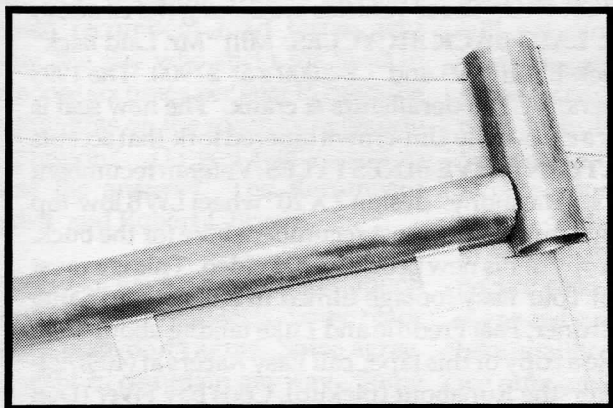


Photo 2: The Pirana Mark IV main-frame assembly
(Photo courtesy of Kevin Haupt & Rick Fowler)

Initial assembly of the main frame was made with tubes laid flat on another piece of cold rolled plate. This is shown in photo #2. The tubes were cut and mitered and then placed in position on the drawing. Shims were used to center tubes of different diameters. The main frame tubes are 1-1/8" X .035" straight gauge chromoly. The head tube has an outside diameter of 1-1/4" which required the use of 1/16" shims under the frame tubes. After tacking, the tubes were clamped to the plat and welding was completed. TIG welding

was used for this project although a similar bike was assembled with MIG welding.

The partially completed frame was placed in the jig and held there by clamping the head tube to an angle plat attached to the base. Standard road bike dropouts were bolted to the rear portion of the jig which incorporates an axle. The jig has a deeply scribed center line which is used for alignment. The rear triangle of the frame was assembled and joined to the main tubes

by 1-1/2" chromoly lugs. Holes were drilled in these lugs with the proper size hole saws. (A tip on using hole saws, feed slowly and use a lot of oil.) The measuring, marking and drilling of these lugs was the most complicated part of this construction technique. The chain stays are stan-

dard road bike but the other two tubes of the rear triangle are straight gauge 1/2" chromoly.

After welding and brazing were completed, the frame was no

longer in alignment. Considerable heating and bending were required to make it "true" once again. So much for the elaborate jig theory. Next time we are going back to particle board and 2X4's.

The Piranha Mark IV was completed using a mix of new and used components. It has a triple crankset in front and a six-speed freewheel at the rear. The wheels are 20" X 1.75" front and 27" by 1-1/4" rear. We prefer 20" front wheels for street riding, the larger diameter makes for smoother riding ability to handle the rough roads of Los Angeles. The seat was acquired from Mr. Milt "Laid Back" Turner. A seat of our own design is in the works. The seat is attached to the top tube with a heavy aluminum clamp that allows for some adjustment. The steering is direct and below the seat using a road stem and mountain bike handlebar. Once again, the placement of the steering is not quite correct. Perhaps we will get it right next time.

Our current projects include, a long wheelbase mono-tube bike out of mild steel, a cheap trike and a short wheelbase FWD bike with 20" wheels, but then, those are other stories....

Kevin C. Haupt
9027 Hubbard St.
Culver City, CA. 90232

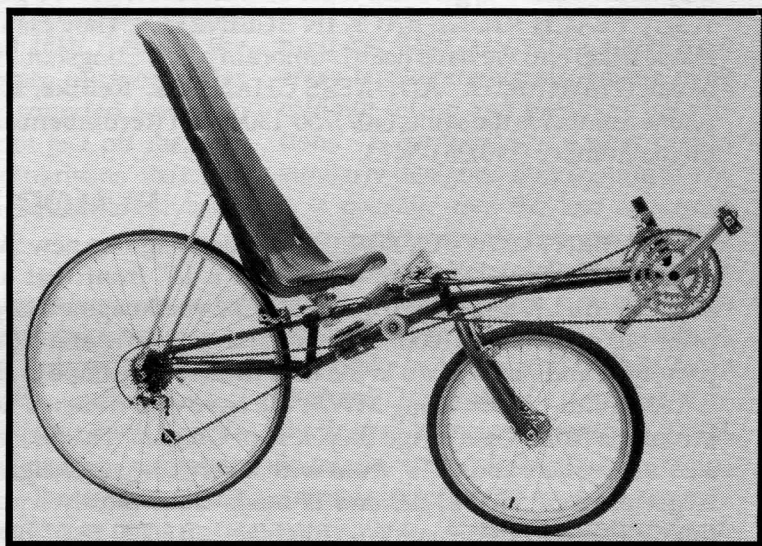
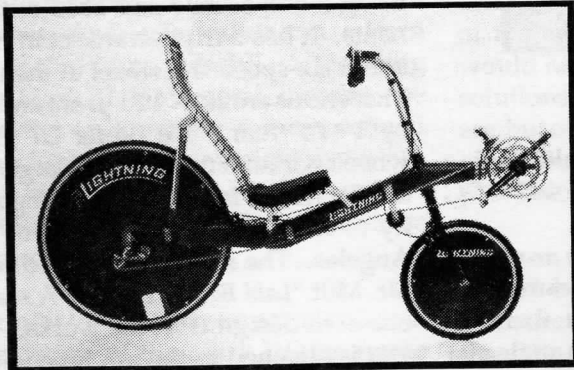


Photo 3: The Piranha Mark IV
(Photo courtesy of Kevin Haupt & Rick Fowler)

RECUMBENT NEWS

LIGHTNING CYCLE DYNAMICS—LOMPOC, CA: Lightning Cycle Dynamics, manufacturing some of the world's fastest road bikes, puts everyone even farther behind with the roll out of the new model R-84. This advanced recumbent features the latest in cycling technology. The R-84's 3.5 lb. frame is constructed mostly of carbon fiber, with some oversized aluminum. Additionally, front AND rear suspension is an integral part of the design.



The new Lightning R-84 composite MWB recumbent
(Photo courtesy of Lightning Cycle Dynamics, Lompoc, CA)

Cornering and acceleration have been noted as similar to a GP motorcycle, while hill climbing is equal to that of a comparable upright bike. The R-84 can also be easily equipped with a road-going fairing; this changes the model designation to F-86. After winning three GT class races at the 18th IHPVA Championships, the prototype R-84/F-86 is now used by Pete Penseyres for commuting, as part of an accelerated durability test program. The R-84 weighs only 21.2 lbs and has a mix of exotic components such as Bullseye crankset, Nuke Proof Hubs, Hugi Cassette, Mathauser brakes. Wheel covers are Lightning's new Lightweight-Composite. Price: Frameset \$3000. Complete bike \$5800. Contact Lightning Cycle Dynamics at (805)736-0700.

VARNA RECUMBENTS: News from the great white north! That Maestro of HPV design, George Georgiev of Varna Recumbents has some news: He is now offering his Varna SWB.

These are beautifully handmade to your anatomical dimensions and preferences. Models available are a 6-spd. at \$1400, 9 spd. at \$1500 and an 18 spd. at \$1600 (quoted in Canadian dollars). George will also build you one in titanium. The bike uses a 26" rear wheel and a 20" front. George is also offering the plans for the Varna SWB; the price is \$25 Canadian. He is also building a few of the Paul Smith/ George Georgiev FWD trikes as pictured elsewhere in this issue. Frames for these trikes sell for around \$900 Canadian. Contact George at (604) 247-8379, or write George at: R.R.#2, Site 54, Gabriola Island, BC, Canada VOR 1X0. These vehicles are among the cleanest, simplest most original recumbent bicycles that we have ever seen.

LAI D BACK BICYCLES: Milt "Mr. Laid Back" Turner called to say that he is now offering ready-to-ride Laid back-E's at \$699 and LB-2000's at \$1900. The 1993 "2000" weighs in at under 28 lbs, has 21 speeds, Sachs twist shifters, XC Pro derailleurs & crank. The new seat is Graphite and Kevlar, it is said to be very light. The LB-2000 has new a chro-moly Uni-crown tapered fork that accepts 16"/17" front wheels. Call Milt Turner at (213)383-0030.

EASY ALTERNATIVE BIKESTYLES: Veteran recumbent designer, Ed Roeters, turned up at Yreka IHPSC with his prototype "Harmony" design 2 X 20" wheel LWB low-top tube recumbent. As usual, the bikes are very simple, lo-tech and get our vote as most recumbent bike for the buck.

EASY RACERS: Gardner Martin and company recently sent us a copy of his new promotional video. This is a must have for Tour Easy fans. Featuring twelve minutes of wonderful Tour Easy footage filmed in and around Santa Cruz, Watsonville, and Monterey, California. You'll get to see Gardner, Fast Freddie and Luke talking about what they know best. We give this video four stars.★★★★ To purchase a copy of this tape, call Easy Racers at (408)722-9797.

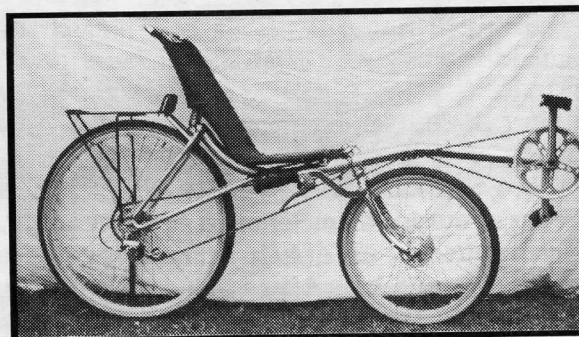
PEACH RIDGE BACK IN BUSINESS! They plan to offer the Runabout (pickup), Coos bay Flyer (Don Harse trike) and we have heard rumors of a new Slingshot. Write them at: 9607 Rosewood, Cleveland Ohio, 44105, or call (216)341-6939.

ADDRESS CHANGES: ReBike, 103-N.W. 43rd St., Suite #1, Boca Raton, FL, 33431. The phone number is the same, (407)750-1304. DH Recumbents Inc., 18512 Carrot St., Suite 428, Spring, TX 77379. New phone number (713)251-5413.

RUMOR-MILL

RECUMBENT CONVERTIBLE? Can you imagine a new SWB recumbent with a 24" rear wheel and a 16" front that also converts to a LWB within 20 minutes? Can you imagine a target price tag of under \$1000? We can and we know of a riding prototype and production in the near future. We hope to ride it this month.

LOW-slung MWB: We have also ridden a new prototype from "Space Age Bicycles" in Oregon. The bike has a 26" rear wheel and a 16" front with a very low seat height, a target price of \$800-\$1200 and is made from mostly square tubing. For more information on this bike, call 1-700-FUN-BIKE. Keep your ears open and your eyes focus for the next RCM Rumor Mill.....we can hardly wait!



The SWB Varna
(Photo courtesy of Georgi Georgiev)



The Space-Age Bicycle's new MWB recumbent
(Photo courtesy of Space Age Bicycles)



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ROAD TESTER QUALIFICATIONS

ROBERT J. BRYANT

RCM PUBLISHER

In what publication can you read road tests on recumbent bicycles in nearly ever issue? And in what publication are the road tests up to nine pages long, longer than any other bicycle road tests? O.K., next question, who is the only known recumbent road tester, you know, the guy who sticks his head in the noose six times per year to describe his thoughts on the recumbent bicycle in question? Do you really need to know the answer? The Recumbent Cyclist and Robert J. Bryant.

Recently, I have been under much scrutiny for our road tests. Some readers just plain don't agree. Some agree, but want to complain anyway. Some want more information, some want less (are the tests too long?). Others are manufacturers who feel they got a bad wrap, still others are manufacturers who have not had, but want a road test. The original idea for the road tests was to describe what it was like to ride a given bike so that the reader could picture in his mind an imaginary test ride. This is why our road tests are based more on the way they ride and feel rather than spec & theory. We do list many specs, but we have listed them in written paragraphs where some readers miss them. We are constantly asked why we cannot be like Road & Track. The reason is simple, our yearly budget is most likely less than the small-

est display ad in one issue.

Recumbent manufacturers, owners and enthusiasts are an extremely opinionated group. I am living proof of that. With every recumbent rider you will get different observations as to what is good or bad about any one particular design of recumbent bicycle. Each manufacturer believes for various reasons that their design is the best! Most consumers are completely and utterly confused by the time they talk to several manufacturers. Every aspect of each bike is debatable, including speed comparisons, comfort levels, bike quality etc. In the RCM road tests, we offer our own views and try to look at each individual bike through the eyes of various types of riders. Our goal is for a well rounded test. My impressions are not just off the wall opinions, but comparisons that I've made to other like models and styles of bike.

Our testing procedures have grown far beyond riding the test bike around the block a few times, but we can never please everyone. We invite your letters, opinions and if you don't like the test, please write your own evaluation and submit it to us. Remember, this is not an easy process. We set up and ride our test bikes daily for a month or so while we are writing the article. We

estimate the total time involved to test and write the article can be as much as 100 hours.

Thanks to our readers, we are now preparing better criteria (see below) and tougher standards. As a recumbent promoter, I see the good points in all of the bikes and I sell the concept of recumbency. My nature and writing style brings out the best in the bikes—so look deeper for the negatives and specs in the tests.

Ask yourself where the bike fits into the market. Perspective is necessary when considering cost vs. value vs. market competition. For example, a mythical \$499 recumbent could have entry level components, have a more difficult set-up and mediocre instructions. If compared to a near perfect similarly designed bike costing \$1499, it is possible that the less expensive bike could get a better review. The reason why? Potentially three to four times as many riders can afford the cheaper bike, they have fun with it, and best of all, they still have \$1000 in the bank. We also have very high standards for bikes costing over \$1200. Manuals, instructions, finish quality, amount of set up (if any) are strongly considered. A manufacturer providing a \$400-\$750 recumbent may be judged on looser guidelines. Finding

direct-market competition is somewhat difficult, as recumbent brands are spread out by price and design.

We can and will find things to improve on any design. The readers as well as the manufacturers should appreciate this. We have discussed new road test criteria with some highly respected recumbent manufacturers. Below is a list of issues that we will try harder to list in most road tests.

with us? Please be constructive. Offer tips and ideas for future reference. Become involved. If you know we are testing a certain bike, give us input—make arrangements to ride the test-bike—write a paragraph or two! If you disagree with a test, write a letter to the editor in a timely fashion (within one month of publication). If it makes sense, we will generally print these types of letters. Better yet, write an article stating your position.

are "THE SOURCE" for recumbent information. We really have no competition aside from the occasions when mainstream bicycle media does a recumbent test. In reality, RCM cannot be everything to everybody. There are sub-interest groups amongst our readers: world-tourists, racers, recreational riders, homebuilders and couch-enthusiasts (non-bike owners). I strongly urge you to write about your favorite recumbent subject for this magazine.

What should you do if you disagree In closing, it is hard for us because we

10 IDEAS TO MAKE OUR ROAD TESTS BETTER

1. List the seat height.
2. List the crank height.
3. Check the crank relation to front wheel.
4. List the wheelbase.
5. Weight distribution (we will check this).
6. Bike weight (we will weigh the bikes).
7. Head angle & pertinent geometry issues.
8. We will experiment with coast down tests*.
9. We will experiment with a braking test*.
10. We will be revising our test format, style, and look in the near future.

*These items will be tested on "Enthusiast" recumbents only, where performance is a consideration.

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Effective January 1st 1993, RCM will charge for some subscriber personal classified ads. (Rates are listed on page 24.)

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PEACH RIDGE RECUMBENTS: Three wheelers available. These are the perfect commuting and errand running vehicles. Not another kind of bicycles, another kind of car. The Runabout and the Coos Bay Flyer, these

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PEOPLE MOVERS: We specialize in Ryan, Linear, Rans, Infinity, Laid-Back & A.T.P. recumbent bicycles, Land Rowers, Chainless Bicycles and Gravity Formula-1 Cars. 811- So. Tustin Ave. (At 22 Fwy. in Orange) Phone (714)633-3663. Your full service recumbent shop. (CA)

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FOR SALE: 1991 RANS NIMBUS FRAMESET: Including seat, handlebars and headset. Green in color. Priced to sell \$249. Call Chuck Osborne (313)487-4152 call between noon and 8pm only EST. (MI)

FOR SALE: USED LIGHTNING PARTS: F-40 nose cones, 2 each. The fiberglass is cracked in some areas, but is repairable, \$100 each. P-38 XL red frameset, with new paint. The frame has been repaired in a couple of places, \$500. Contact: Lightning Cycle Dynamics, (805)735-0700 (CA)

FOR SALE: AERODYNAMIC BODY SHELL KITS, For HPV's or experimental light vehicles. Generic design adapts to many trike and cyclecar chassis. Kit includes: canopy, upper, lower body shells, instructions. Only \$695. plus shipping. Info pak \$3. BLUE SKY DESIGN, P.O. Box 2014, Thousand Oaks, CA. 91358-0912. PH#(805)498-4221. (CA)

FOR SALE: DeFelice Recumbent Bicycle Corporation manufactured recumbents from 1983 through 1988. Over 600 recumbents were sold in two different styles. We have lots of inventory: frames in various stages of completion, wheels, cranksets, head-set bearings, cables, levers, brake sets, and various tooling, dies, weld and braze fixtures. Call for an accurate inventory list. Call: 317-861-6045 (IN)

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ket St., Mt. Carmel, IL. 62863. Phone#(618)263-3557. (IL)

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MOULTON RECUMBENT! yes, this one of a kind is a hybrid that I built this past year. It has full suspension and a ride that is as smooth as they come. Intermediate gearing provides 35 gears. Incredible low end and top end choices. Adjustable seat can accommodate a wide variety of people. This is a folding bike; the longest piece is 27". I recently took it to Europe and it performed perfectly. Asking \$1800 or offer. SWB/ BMX based recumbent This bike has a leading link front suspension and an elastomer suspended rear end. It has a 16" alloy front wheel and a 20" alloy rear with 21 indexed gears. Extremely comfortable and easy to handle. This bike does need painting, but is a steal at \$650. Call Don Latarski at (503)343-8184 or write: PO Box 10232, Eugene, OR 97440. Photo available on request, serious inquiries only. (OR)

FOR SALE: 1990 LIGHTNING P-38: Size XL, red, performance wheels, Phil Wood 40 spoke rear hub, Magura Hyrostop brakes, Gripshifts, Deore XT, Lightning aero-panniers (new never-used), Zzipper, bolt on seat and custom and stock handlebars. Very good condition. \$1799. Call Mike Ziegenbien (days only) at (404)564-7987. (GA)

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FOR SALE: 1991 RYAN VANGUARD, Excellent condition. Includes Grip-Shift shifters, rack, fenders, kickstand and bottle cage. \$975. Call Ryan Watson (303)444-3407 (CO)

1991-1/2 Ryan Vanguard: American Classic hubs, red, computer & mount, new seat, tires and seat-bag. \$975. Millennium (206)630-7200-Hotline, (206)639-2347-office. (WA)

FWD! Homebuilt front wheel drive Traylor designed rideable, unfinished frame with some parts: new double crank, new tires, new freewheel, new stem & bars and a new 20" steel front wheel. Must sell—below our cost. Experience FWD! \$149 + shipping. MILLENNIUM CYCLES, (206)630-7200-Hotline & (206)639-2347-office. (WA)

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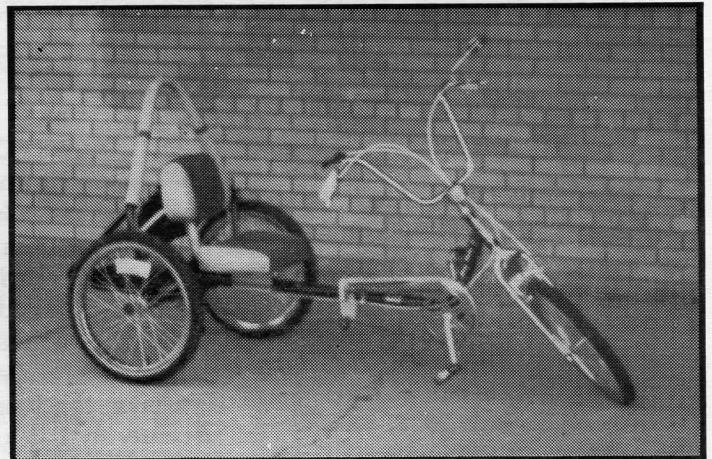
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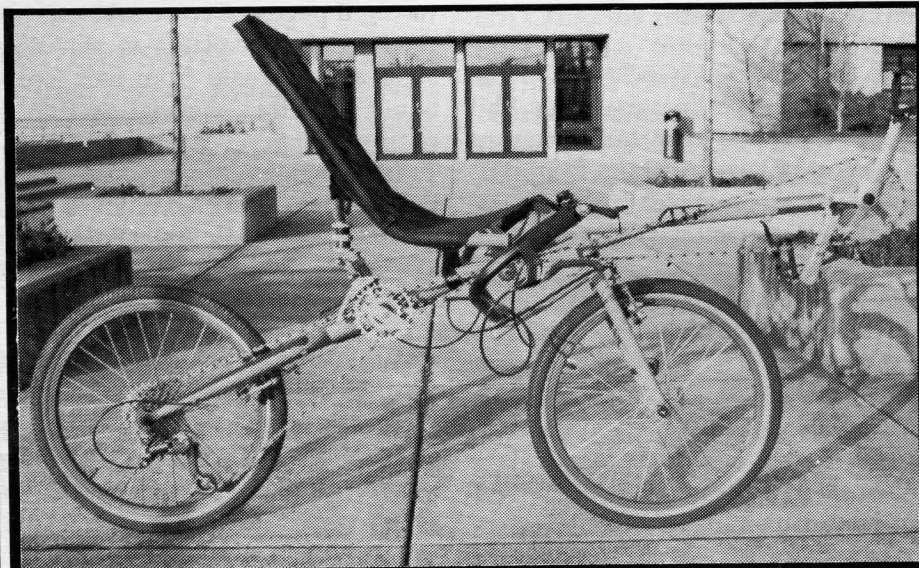


The Easy Rider 3
(Photos courtesy of R & D Tech)

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