

# **Recumbent Cyclist**

M A G A Z I N E

May - June - July 1992 RCM #11



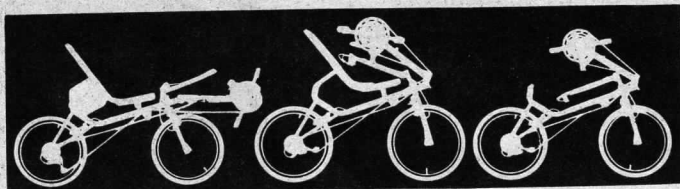
**The Counterpoint Presto Test**

# PRESTO

RECUMBENT



Couterpoint Presto  
(Photo courtesy of Angle Lake Cycle)



Presto compacting w/PivotingFrontBoom option

## THE COUNTERPOINT PRESTO

*COUNTERPOINT: The art of adding a related but independent melody or melodies to a basic melody in accordance with fixed rules of harmony to make a harmonic whole.*

**THE COUNTERPOINT PRESTO** is the definition for the term "New Breed of SWB Recumbents." When designed back in 1988, the Presto was the first SWB recumbent with two wheels of the same size, the first recumbent with seat-suspension and the first production monotube frame. What does this bike have to offer? The list of custom features and options goes on and on, with a first rate design team, one of the best frame-builders in the country and the distributor Angle Lake Cyclery, an innovative forward thinking bike shop and recumbent marketing pioneer. The bike is a compact, quick, versatile and is one exciting bicycle to ride.

*PRESTO: In rapid tempo. Suddenly; at once, ready.*

**COUNTERPOINT TEAM:** Jim Weaver of Counterpoint Conveyance Ltd. is the designer of the Counterpoint "single", the Presto. He is also the designer of the famous Opus semi-recumbent tandem. Jim Weaver is a Musician from Edmonds (WA.). When not designing and building HPV's, he plays the French Horn for the Seattle Opera and Symphony. Most recently, added to his design credits is a beautiful & futuristic 20" wheeled (front & rear) road/touring bike called the "Attaca." The Counterpoint bikes are innovative, exciting and somewhat avant-garde in design. They are unlike anything else available.

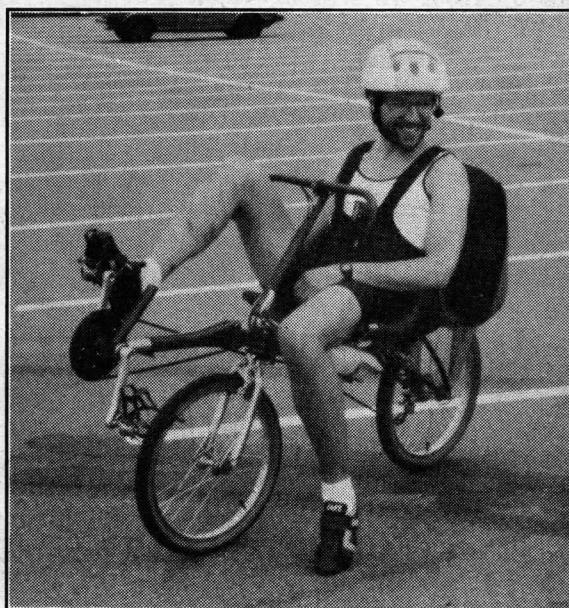
*"For me there's no sense in repeating 100-year old ideas, I'd rather build a bike that contributes something new." Jim Weaver, Bicycle Guide, June 1989.*

**ANGLE LAKE CYCLERY** is a bike shop for serious bike enthusiasts and a Northwest cycling institution. For the HPV enthusiast, a stop at Angle Lake is a must. They are the USA distributors for Alex Moulton bicycles and Counterpoint bicycles. They also have a mix of rare and limited production "weird" bikes. Many are collectables and not for sale. The more mainstream items include Terry bikes, Off-Road Pro-Flex, Montague and Schwinn bicycles. Angle Lake has a strict policy to "test" each item that they sell. What this means to Counterpoint customers is that each mechanical specification has been on a Counterpoint test bike for six months or more. A full service bike shop selling recumbents is a rarity, Angle Lake's staff has the capability to handle your most involved recumbent modification. They also have a great selection of recumbent parts and small wheel technology is their specialty.

Angle Lake's staff is professional and knowledgeable. The Angle Lake team members include Owner's: Kelvin and Dale Clark; Product Manager/ Coordinator: Matt Dekker

and General Manager: Bob Kueker. The shop mechanics are also first rate. Co-owner Kelvin Clark and his staff are very involved in local bicycling, and of course, this includes taking Prestos and Opuses everywhere. With all of these exceptional bikes at his disposal, shop owner Kelvin Clark admitted to me that his two favorite bikes in the shop are his Presto and Moulton Jubilee. Dale Clark is Angle Lake's most public figure, attending many shows and cycling events. Dale also does the company's ad artwork/ layout, and is very involved in product R & D. Research & Development is an integral part of what Angle Lake does. The Presto is a very carefully spec'ed bike. You won't find any "sale" items on the bike, each component is there for a reason. Dale has the nickname of MacGiver around the shop, this stems from being able to fix or fabricate most anything. When I asked for a kickstand on my test Presto, Kelvin said "we don't really have a good one..., but if you're willing to pay some shop time, I'm sure Dale could make one..."

**ROOTS IN THE SKY, BICYCLES THAT FLY:** Paul Atwood has been riding his Prestos since the bike was first introduced. Paul has used his Presto for daily transportation for several years. He is a Northwest (Bellevue, WA) native who moved his company to Corvallis, Oregon. The inspiration for the "Roots Accessories" was to produce optional equipment that transforms the Presto from a bicycle to a practical weatherproof human powered vehicle. "Roots-in-the-Sky" fabricates the custom stem/ handlebar, the carbon-fiber Chainguard, the Front Fairing (nose), the front wheel fairing and the waterproof Darlex Body Stocking. A new AeroTrunk will have been introduced by the time you read this article.



Paul Atwood on his first Presto  
(Staff Photo)

## The Recumbent Cyclist

**THE ROOTS AERO ACCESSORIES** are the best and most convenient to use of any HPV Aero parts that we have seen. The Front Fairing is made of S-Glass/Kevlar/Carbon Fiber. In the past they were painted (Imron) to match the

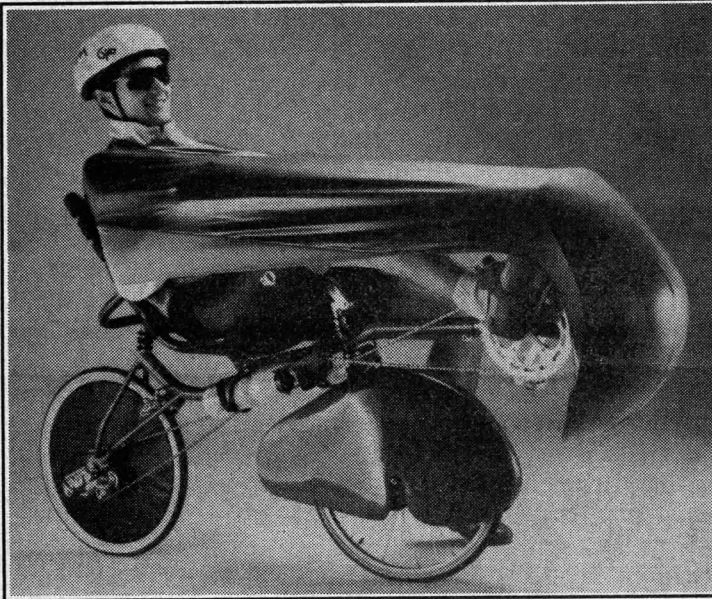
moly tube would actually be weaker. The boom is stainless to keep it from rusting since there is no paint on it. The Presto fork is a full chro-moly fork of BMX Racing design, built to Counterpoint specs by SE Racing in California. The frame is TIG welded; the welds are beautiful and the overall finish quality is unsurpassed. The paint on the Presto is a high quality Powdercoat your choice of Rhapsody Blue or Black. Custom Imron paint is available, and we have seen some fantastic custom paint jobs.

**PRESTO SPECIFICATIONS:** The Presto comes in three standard packages. The most popular is the Presto SE Tour, which currently sells for \$1699. The standard equipment includes: Sun Rims, Shimano LX hubs, ACS 20" X 1.75" tires, Ritchey Logic Headset, SunTour XCD-LTD brake levers, DiaCompe Nippon 883 brakes with Aztec pads, Deore LX front and rear derailleurs, Shimano Bar-Cons, a 12-28 freehub, Sedisport Chain, Shimano DX cartridge sealed bottom bracket and a SunTour Superbe triple crank 38/54/61. The gear inch range is 27-102.

The Presto SE High Performance package includes IRC Roadlite 20" X 1-1/8" tires, a 12-24 freewheel and DiaCompe 630GX brakes. (other componentry same as above).

New for '92 is the Presto CL. The current price for this model is \$1399. This model comes with Araya rims, Shimano hubs, Haro 1.5" tires, YST Headset, Dia Compe brakes with Kool Stop pads, Shimano 400 LX front and rear derailleurs, S.I.S. thumbshifters, a 12-28 freewheel, Sedisport chain, a Sakae bottom bracket and SR 34/46/54 crankset. The gear inch range is 24-90.

The CL and SE use the same frame, the CL is painted black



Presto with Roots Accessories  
(Photo courtesy of Angle Lake Cycle)

bike. The latest version has natural woven Kevlar fibers that create a gold & black check pattern, and looks 3-dimensional. This Fairing straps onto the boom with Velcro and the total unit weighs only 28 oz. The Wheel Fairing (pant) is an advanced aerodynamic fender. This unit weighs only 24 oz. The new trunk is built to be aerodynamic, contoured and best of all holds 4000 cubic inches of cargo. The Body Stocking is made from Darlex, a 2 or 3 layer Lycra-nylon laminate with layer of polyurethane (plastic) film. This hi-tech material makes a durable, waterproof, weatherproof, aerodynamic and easy to use HPV body. It is the only one of its kind available in the USA today. The total Roots package only weighs 5-pounds. The "Roots" accessories make the Presto into a true HPV.

**PRESTO FRAMESET:** The Presto frame was way ahead of its time when designed back in 1988. It was originally designed as the "SFR" (single folding recumbent). The Presto still offers the folding boom as an option, but the SFR name is gone. Most of the Prestos are delivered with fat tires and non-folding frame. The Presto fame is made from three types metal, chro-moly, hi-tensile and stainless steel. The main frame tube is hi-ten. This type of recumbent frame does not necessarily need chro-moly in all tubes. In their R & D, Counterpoint and Angle Lake tried other types of metal for the main-frame tube. Due to the nature of the main tube's bend, a chro-



The Presto CL  
(Staff Photo)

and the SE is blue. Angle Lake does not spec pedals on any of their Presto models, but will make recommendations for each individual customer. Most of these components can be upgraded to suit the needs of the customers.

The Presto has a 36.75" wheelbase; overall height is 38", seat height from the ground is 24.5." The Presto's weight distribution is 54% front and 46% rear. The bike's weight depends on which model you have: The Presto CL, weighs 29 lbs. without pedals, The SE Tour weighs 28.5 lbs. without pedals. The Presto Performance weighs 27 lbs. with the 20" X 1-1/8" wheels and a triple crank, but without pedals.

that will adapt to any of the three models. Some of the highlights of the option list include the custom Esge 20", custom fenders which Angle Lake has manufactured for the Presto and Opus. For carrying cargo, there is the Roots trunk or the Bel-Ami Transverse Trunk (you will definitely need one or the other!). They also offer a seat-mount backpack/ touring bag and a special Blackburn Rack that fits the Presto very nicely. We also liked the waterbottle cages that attach to the lower seat rails. When you order your new Presto be sure to study the accessory list and ask Angle Lake if they have any new options not on the list.

**CUSTOM DESIGN FEATURES:** There are many superb design features on the Presto. People who have not ridden the Presto before may be concerned about some of these innovations. The forward folding handlebar strut offers convenience and safety for mounting and dismounting. The upright steering is more aerodynamic while offering a convenient place to mount a (necessary) rear view mirror and computer. The handlebars can be adjusted by an allenbolt for position to your body. The idea is to rest your upper-arms against the seat upright rail for a totally relaxed position and extend your arms to the handlebars. You can keep your upper body relaxed on the Presto as you can with underseat steering recumbents. The steering strut is free floating (backward & forward), you have to want it to move. There is not enough inertia to make it go forward during riding or stops. Pushing the strut forward is a planned move. It is a very convenient, well thought out and a completely safe system.



The Presto SE Tour  
(Photo courtesy of Angle Lake Cycle)

**BRAKING:** The Presto offers many braking options, from adequate to superior in performance. On the SE Tour model, the Dia Compe Nippon long reach side-pulls are a high quality BMX brake. The stock Aztec brake pads are a real asset. If you need more braking than this, Magura Hydrostops (Hydraulic) are available, we consider these to be the best recumbent brakes available. They offer absolutely incredible braking performance. The "Performance model" offers slightly better braking than the Nippons but does not compare with the power of the Maguras. With the (preferable) fat tires on the SE Tour, you need the long reach brake caliper, so unless you can afford the Maguras, the Nippons are the best suited brake for this application. In our braking tests we were unable to get the rear wheel off the ground. Angle Lake has also run similar tests. The overall braking performance was excellent in all situations.

**ACCESSORIES:** Counterpoint offers a list of 32 different optional items, including the Roots in the Sky Accessories,

The Presto became the first recumbent to offer a suspended seat back in 1988. The original "spring" system has since been changed to the Offroad ProFlex elastomer bumper (doughnut) as found on Offroad ProFlex Bicycles. The suspension unit is mounted to the back of the seat. Pedaling pressure is not affected by this suspension. The Presto pedaling position is on a horizontal plane, as are most recumbents. The seat suspension is on a vertical plane. This means that you will not get any suspension bounce from your pedaling pressure. The suspension only works when you roll over bumps in your path, which cause the seat to suspend vertically. Counterpoint has taken a straight forward and simple approach to recumbent suspension. We feel that this system will be the benchmark for all recumbent suspensions to come, and we give it our highest honors.

**MESH SEAT:** To put it simply, the Presto has the BEST sling-type seat we've ever tested. The material and construction is unequalled in quality. Velcro is used to fasten the seat on the two piece aluminum seat frame. The seating straps look similar to seat-belt material; a two-layer padded mesh base and a breathable mesh backing create a wonderfully comfortable seat. The Velcro straps make the

mesh seat easily removable (no plastic buckles & straps to fool with). The seat frame then slides out of its steel frame mounts. The Presto seat is very comfortable and truly an all day seat. Presto seats are made for Counterpoint by Bel-Ami in Seattle.

**TARGET MARKET:** Angle Lake Cyclery is a very unique bicycle shop, offering entry level Schwinn's & Trek's mixed with upscale and non-traditional bikes. Counterpoints and Moultons are right at home parked side by side in their showroom. The Presto is a great bike, an excellent value when compared to it's competition in the upper realm of the recumbent bicycle market. This sector of the recumbent market is still very small. Our recent recumbent market survey revealed that 17% of the recumbents sold in 1991 had list prices of \$1500 or more.

**PRESTO PRACTICALITY:** The Presto stows and transports better than a conventional bike and almost all other recumbents. The optional folding boom shortens the bike's length and the seat completely removes as do the wheels. The Presto can be transported inside many cars, on roof racks (no special rack-mounts are needed) and even bumper racks work great. Traveling/transporting this bike is an absolute joy.

We found the Presto to be an extremely durable and very well put together bike; the road test was completely trouble-free. The tires on the Presto are our favorite ACS RL Edge. If your recumbent will accept these—get them; cost is around \$20. These fat treaded tires look bulky, but are extremely high quality. The tire life will most likely be better than any tire of its kind and flat tires may be a thing of the past. These tires take a 1.5/1.75 rim (The Presto uses Sun Metal C20 rims). On our (now) World Famous Soo's

Creek Test site, these tires are the fastest way to go. Why?

First, we must throw "rolling mass theories" out the window. When crossing a gravel parking lot, wood bridges, winding paths through the woods with occasional rocks, pebbles, dirt, leaves and bumps, there is no reason to slow down when your bike is set up like our test Presto. The IRC Roadlites are equally good tires, but must be babied under these same conditions and are prone to flat tires.

Portland Presto rider Ron Schmid had this to say in a recent Counterpoint Newsletter, "the new RL Edge ACS 20" X 1.75 100 psi tires..... are very hard, tough and roll very fast. Cornering and control are superb and the best thing of all, after 500 miles this riding season, I have not had a flat tire yet."

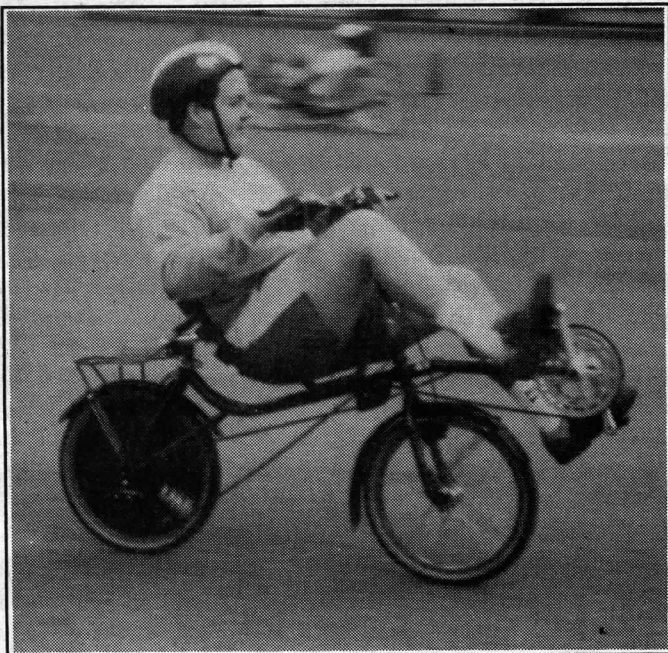
The bike also receives high ratings for trailer towing. The short bike length and nimble handling characteristics made for easy towing of our Burley trailer.

The "Roots accessories make the Presto the most practical "all weather" recumbent bicycle available today. Add the fairings, body stocking and trunk and you have a true HPV.

**PRESTO DESIGN CRITIQUE:** The most impressive point to the Presto design is the advanced way that they have kept all systems simple. The bike is built right and offers correct handling, impressive road manners and top quality construction. The overall quality of this recumbent is excellent. The design team (Jim Weaver, Angle Lake Staff and Paul Atwood) continues to make the bike better and better. It is very apparent that Angle lake & Counterpoint both listen to their customers and ride their own product, which we feel is very important. We were only able to find two traits worthy of mention.

**SEAT HEIGHT:** A drawback for some will be the Presto's seat height. Counterpoint explains it in this way: "Seat height of the Presto is as high as possible, using the standard Counterpoint seat. Some may argue for a lower height, but try balancing a pencil vertically on your finger, then cut the pencil in half and try again. The reaction time necessary to balance a taller bicycle is longer, allowing the rider to make more refined balance corrections and therefore creating stability. Height is also a key to seeing and being seen in traffic....." The fact remains, the Presto's seat height can be a problem for some shorter riders.

**GEARING:** Whenever 20" wheels are mentioned, the question of gearing soon follows. The Presto Tour SE comes stock with a 38/54/61 and a 12-28 cassette freewheel. The gear inch range is 27-102. Is this enough gearing? The answer is yes and no. For most riders, yes, the absence of a higher gear will mean no pedaling at 35+m.p.h. down steep hills. The possibility of running out of gears exists when you add the Roots accessories. Chainrings larger than 61 are available for riders needing more high gears, and we've have heard rumors about 10 and 11 tooth freewheel cogs that should be available within the next



Ron Schmid on his custom Presto

year. An 11 tooth would raise the Presto's high gear to 111 and the "10-T." would raise it to 122. Angle Lake is continually testing new gearing arrangements for the Presto. For the majority of Presto riders, the standard gearing is very adequate.

**ADVANCED PRESTO RIDING-101:** During our testing period, Angle Lake Co-owner Dale Clark came by for a spin down the Soo's Creek trail. Dale was riding his trusty Moulton Jubilee and I was on our test Presto. Dale instructed me on advanced Presto riding techniques; including a one they call (excuse my french) butt-steer. With practice, it is possible to use the steering strut and your legs for leverage to move your body position around on the seat. This technique can be used to lift for bumps or to carve fast turns using body english that is not usually possible on a recumbent. This can result in a personal revelation in your recumbent riding.

Dale also instructed me on a technique for holding up and stopping on the bike; you slide forward on the seat, fold the steering strut forward, and hold your feet straight out on both sides of the front wheel. This makes holding this bike up very easy in comparison to the previous way that I was doing it, which is to hold you leg faced backward and on your tippy-toes. This correct technique can make riding a Presto easy for most any height of rider.

**WHY DO WE LIKE THIS BIKE SO MUCH?:** The Presto is a bike that grows on you. For me, it has taken four years. Every spring since 1988, I make my trek up to Angle Lake to see the latest R & D (research & development) and component upgrades on the Presto. It is also a fantastic Northwest bike or "all-weather bike," as proven by the very loyal following of Presto owners in Washington and Oregon. Appearance-wise, Angle Lake will do anything you want. Paint options are nearly unlimited as is custom component selection. Hopefully, they have already tested what you are considering and can tell you how it works.

The Presto tracks better than any other SWB, MWB and many LWB recumbents. This means an effortless invisible straight track that your bike follows. The pedaling position is also very user-friendly and different than any of the other SWB-MWB recumbents that we've tested. The boom-bracket/ spindle height is not as high as on other similar designs. This makes for a more comfortable pedaling angle, great hill climbing and no numb-foot problems. The Presto test has convinced us that a higher spindle height provides better hill climbing abilities.

What really has me enthused is the advanced stages at which this bike can be ridden. At first glance, it appears to be a tricky ride, most who take the 5-minute Angle Lake Presto riding course quickly become accustomed to the bikes characteristics. The Presto is different because it is ridden with the finesse of a road bike, offering a ride we have not seen before on a commercially built recumbent.

**SPEED:** Even though the designers did not have performance in mind with the Presto, the bike is fast. We found that it accelerated quickly and was stable at all speeds. Diving into the rolling curves on our test loop was an experience that we have not had on other recumbents before. It can only be described as being "at-one with the bike." We still feel that all SWB recumbents need some time to get accustomed to the inherent quick handling.

If you're looking for a bike with quick-controlled sports car-like handling and a bike that does everything well, the Counterpoint Presto may be the bike. Whether you want to cross the USA, commute to work or race HPV's, the Presto will be right at home in most any situation. For more information on Counterpoint Recumbents, contact: Angle Lake Cyclery, 20840 Pacific Hwy. So., Seattle, WA. 98198-5999. Ph.# (206)878-7457, FAX#(206)824-3038.

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## A BRIEF HISTORY OF THE COUNTERPOINT PRESTO

by Jim Weaver

As with all the current Counterpoint bicycles, the Presto evolved through observations of other peoples' designs, and a recognition of my own personal needs. After designing the Opus tandem, I became involved with Human Powered Vehicle speed trials. I had great hopes of generating some sales and establishing the great utility of the bike. This did not materialize to any great degree, but it did give me the opportunity to observe many single recumbent designs in action, and even try out these "bikes of the future." My experiences with these machines, left me wondering whether any single recumbent could be made as easy to ride as a traditional bicycle. I felt that no recumbent would succeed in the market if it couldn't be ridden the first time by an inexperienced rider. I don't believe that any reasonable person will pay top dollar for a bicycle based on promises that he or she will get used to it!

So I put off thinking of building a single recumbent for some time. Then I discovered one recumbent that was actually easy to ride. By virtue of its high center of gravity and above legs steering, these bikes went straight down the road without wobble, and also took advantage of many of the motor responses that I had developed on my traditional road bike. Being duly convinced of the possibilities of the single recumbent, all I needed was the time to work out the details of my own design.

I started by modifying an old three speed bike that was lying around. I learned through this experiment the importance of seat suspension and seat back angle, as well as some other parameters involving the drive system. Still not having much time to play with it, I shelved it again.

My next round with the idea was forced on me by a neck injury that I had sustained while putting a ceiling in my basement. This injury made it very uncomfortable to ride an upright bike due to the shock that is transferred up the arms and into the upper back. Fortunately, sales of the tandem were slow enough to give me the time I needed to draft my own single recumbent design.

Recognizing the parameters established by body size, wheel size and seat comfort, I soon had a design that I felt would achieve the riding characteristics that I wanted, and be practical to build. The first prototype took two days to fabricate and make rideable. The result was Instant Success! Not only could I ride it easily, but almost every person that I had try the bike was able to balance the bike with few false starts. I tried anyone that was willing or curious, from experienced riders to non riders. The results convinced me that the design was well worth refining to be offered as a Counterpoint product.

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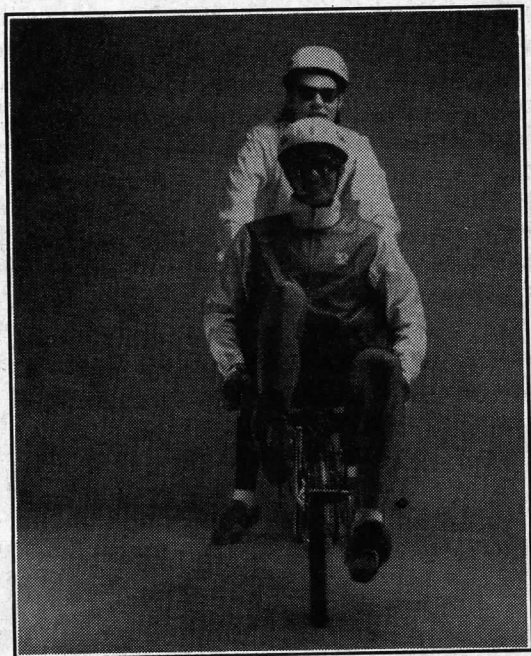


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The second prototype was taken to Angle Lake Cycle to test their response to the bike. Since the people at Angle Lake



Counterpoint Opus Tandem  
(Photo courtesy of Angle Lake Cycle)

Cycle have the longest experience dealing with recumbents, I felt that their feedback would be very useful in developing the design. The owner, Kelvin Clark, was very favorably impressed with the ride quality and handling capabilities of the single. His immediate ability to balance at low speed and almost "track stand" proved to him the ease with which a rider can adjust to the bike. This capability has since proven to be a key to the Presto's success. Most recently, a national magazine editor responded by saying that, "It feels like a real bike."

Over the years since its introduction, the Presto has kept pace with all of the new component changes to meet the demands of today's riders. Indexed shifting, clipless pedals, mesh seats, fairings, rain covers and several other small items now constitute a truly complete accessory package that meets or exceeds what is offered for conventional bicycles. The goal of the Presto design has always been to provide a practical alternative to the conventional bicycle. Special thanks to the cooperative efforts of Angle Lake Cycle, and friends like Paul Atwood (Roots in the Sky), and many faithful customers, I feel that the goal has been achieved.

Jim Weaver-Presto Designer & Builder  
Edmonds, WA.

## ANGLE LAKE/ COUNTERPOINT PRESTO HISTORY

One day in the spring of 1988 Jim Weaver appeared at our store out of the blue with a bike he called the "SFR" (short wheelbase folding recumbent). This was a surprise to me as all of the conversations that we have ever had were always about Opus III Tandems, that Jim had designed and marketed since 1983. The SFR caught me very off-guard as its design was radically different than other recumbents I had experienced to date. The "radical" appearance was enhanced by the lack of paint on the bike anywhere except a modified lavender BMX stem for the handlebar pivot. Though intriguing to look at, my experience with recumbents back to 1978 had solidified what I believed was the best recumbent format: Long wheelbase, underseat steering. So, I skeptically climbed aboard, and to my amazement was able to do a short track stand my first few seconds on the bike! Jim had two prototypes with him that we proceeded to ride for the next couple of hours. This was a cool bike! "The recumbent for the '90's" I concluded! The above the leg handlebar format I had prejudged as not O.K., turned out to have none of the fatigue producing, excess leverage characteristics I was expecting. This begins a relationship with the bike that has become my personal favorite in recumbent design.

### PRESTO ANECDOTE

Terrance Blum was an early purchaser of a Presto. Terrance was looking to have his own recumbent design built for a lengthy trip he had planned, and came up to Angle Lake to

discuss things over a period of months. His conclusion was to buy a Presto and have a custom bag design built (by "Sew What?"). The bag design is a seat frame mounted rack that converts to a back pack. When asked where his trip would take him, he replied, "I'm going to Brazil, then turn left." About 3000 miles into his trip we got a card from Mexico saying he was still on the road and spoke of a couple items to improve on. He expected to return to the USA in 1992. We haven't heard from Terrence since! So, If anyone runs into this Presto Nomad, have him drop us a postcard.

### CHARTING THE CHANGES

The Angle Lake first changes included the bike being given a musical name: "The Presto." The early bikes was offered in any color as long as it was red (there were a few done in custom colors).

1990 Model year brought a number of refinements:

- + Blue Paint
- + New rear dropouts
- + New fork encompassing new geometry, lighter weight, higher finish quality and a steering dampener.
- + Non-folding frame format as standard, based on feedback from owners, the folding feature continued as an option.
- + Full mesh backrest and map pocket added to seat bottom.
- + Specialized "Rock Combo" handlebars (wide

- drops).
- + Bar Con shifters.
  - + Improved brakes, derailleurs and wheels 1991
  - + Roots In the Sky debuts line of accessories for the Presto: Carbon/ Kevlar Front Fairing, Wheel Fairing, Darlex waterproof Body-Stocking and Aero trunk System.
  - + Roots Kevlar idler wheel cover as standard equipment.
  - + Roots new "SLT" one piece handlebar and stem as standard equipment.
  - + Running change, late year, new steering column pivot base.
  - + Rear suspension changed to "Pro-Flex" Elastomer. Major ride improvement.
  - + Triple Crankset standard on "Tour," lower low and higher high gears than previously available.
  - + Revised design for Transverse Trunk acces-

sory. 1992

- + Shimano Drivetrain components introduced.
- + Model "CL" introduced as a lower priced alternative to the "SE."
- + Mid year availability of "natural" finish Roots Fairing at a lower price.

The objective of the Counterpoint Presto is to be a recumbent bicycle design that works without apology. All of the recumbent design advantages with build quality and reliability of the finest conventional designs. Through feedback from owners and "in-house" testing of new ideas before putting them into the hands of customers, we hope to deliver on this promise.

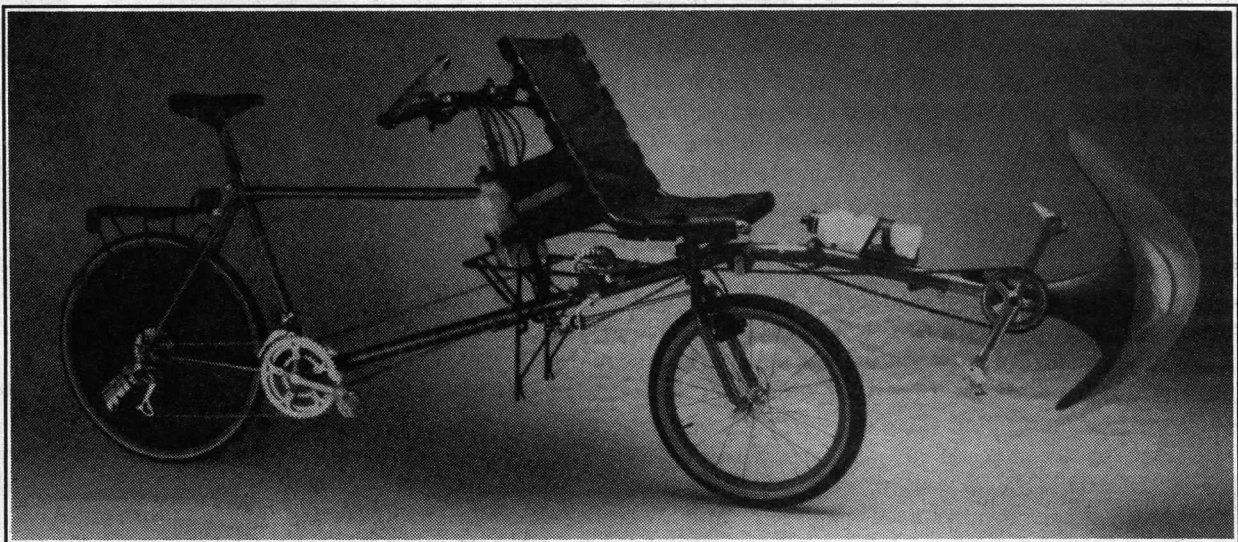
Kelvin Clark  
Angle Lake Cyclery

### COUNTERPOINT OPUS III

The Opus Tandem looks like a short wheel base recumbent bolted onto the front of a mountain bike. The rear rider (captain) rides in an upright position, steers, and has the main gear shift levers. The front rider (stoker) is recumbent. The front wheel is just in front of the stoker's seat. The transmission starts at the front of the bike with the stoker's crank set. That chain runs (on the right side of the bike) to a freewheel under the stoker's seat. The freewheel is on a crossover hub, which drives a chain on the left side of the bike down to the captain's crank set. From there back is a conventional tandem system with a triple crank on the right side. The stoker's freewheel (the shifter is on the front of the tube supporting the right side of the seat) allows the stoker to use a different cadence, or even to coast. Steering uses a tie rod from the bottom of the steerer tube to a tab mounted on the shoulder of the fork.

My wife didn't learn to ride a bike as a child, and efforts to get her to join me on (very) short bike rides weren't working. After about three miles the pain from the saddle on a diamond bike was unacceptable. After sitting briefly on a recumbent, she was willing to try that. We borrowed a Counterpoint, and after half a mile she was ready to place an order. The Counterpoint solved several problems: Her (the stoker's) seat was very comfortable, she didn't have to steer, I didn't have to wait for her, and we could ride at very different cadences. We don't often use the ability of the stoker to coast except when doing low speed maneuvers.

We are very impressed with the Opus. The design solves a common problem in an elegant way, and this allows couples who otherwise couldn't ride together, to ride significant distances. Unlike other tandems I know of, the



The Opus IV  
(Photo courtesy of Angle Lake Cycle)

Opus allows the stoker and captain to ride at different cadences, and the stoker to coast. This makes riding together much easier, as you don't have to get into the toeclips at the same time and then start pedaling at the same time. The stoker gets into toeclips, then the captain gets into the toeclips and after he starts to pedal, the stoker starts. The design of the bike puts the captain's and stoker's heads close enough for comfortable conversation, which is a real pleasure and also allows both riders a good view forward. Many tandem riders get tired of their partner's back, but that problem doesn't exist on the Opus.

The construction quality is good, with many elegant touches. The drivetrain works well. The standard brakes provide enough power to stop the bike, but we added a rear drum drag-brake to avoid problems with fade. I didn't like the original brake levers as I couldn't find a good position for the shift levers, so I changed to mountain bike brake levers and end shifters, which works great.

The handling is rather truck-like, which isn't surprising with so much weight on the front wheel. Also, with the stoker out in front, the front gets a fair bit of momentum in turns, which makes s-turns difficult. The front just doesn't want to change directions quickly. We can make a U-turn in two lanes, but not in one. (I think that's a turning diameter of just under 8 meters.)

With a "low rider" rack (which can carry full size panniers), a rear rack, and a "Counterpoint bag" (a large bag attached with velcro to the back of the stoker's seat), our bike weighs 50 lbs. (23kgs.), which allows us to get it onto a car roof rack with a bit of effort. I lift the bike into about the right position, and she gets the alignment right. Because the low rider rack can carry full size panniers and the behind the stoker bag is quite large, it should be easy to carry enough

gear for touring, including a tent and sleeping bags.

All in all, a wonderful idea, well executed which allows people of different riding abilities and strength to ride comfortably together. We're very pleased with the Opus.

David K. Wittenberg  
Hudson, MA

### THE '92 OPUS IS HERE!

The final specifications for the '92 model are now complete and production is in full swing. The Counterpoint Opus IV, yes, that's four not three. There are enough changes to the frame design this year to boost the bike to a new version number. Most significant is the longer top tube. This allows the use of handlebar extensions on the flat bars giving the captain a more stretched out riding position. The extensions are standard equipment. The rear triangle is now made of lighter tubing which will take some weight off the bike. Up front, the stoker position gets some minor repositioning by raising the bottom bracket and leaning the seat back. Improved heel clearance should result. Once again, two component levels are offered with the CL featuring Suntour XC-LTD running gear and Dia Compe cantilevers. The SE upgrades to Shimano Deore XT and Magura Hydrostop hydraulic brakes. All this and the prices are the same as the '91's at \$2999 for the CL and \$3599 for the SE.

by Rick Pope

This article originally appeared in the April 1992 CounterPointers Newsletter of which Rick is the Editor. The Counterpointer is published quarterly and a subscription is \$5 or \$7 foreign, to: Richard Pope, 6305 S.W. Roundtree Ct., Portland, OR. 97219

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## Letters to the Editor

### LIES & MISREPRESENTATIONS?

Dear Sirs,

I am writing to you for two reasons. First, can you tell me when my subscription is up? Also since I am a "supporter", I would like a little more support, like answering my questions that I send in.... I would like to know what bikes are fastest, commuter friendly etc. Info on products like Sachs Internal hubs and peoples modifications...

I have done things to my bike like full body Lycra cover and tail cone along with above the seat steering, yet the speed is still slower than a conventional mountain bike. I have come to think recumbents are not as fast as everyone claims....

I like recumbents or the idea of them, but lies or misrepresentations of them will not sell them in the long run. I would like more honest opinions from your magazine...

Please reply quickly, thank you again,  
Mark McWilliams

PS I am thinking of buying a Sling Shot by Peach Ridge Cycles, are they still in business? Are they as fast as they claim?

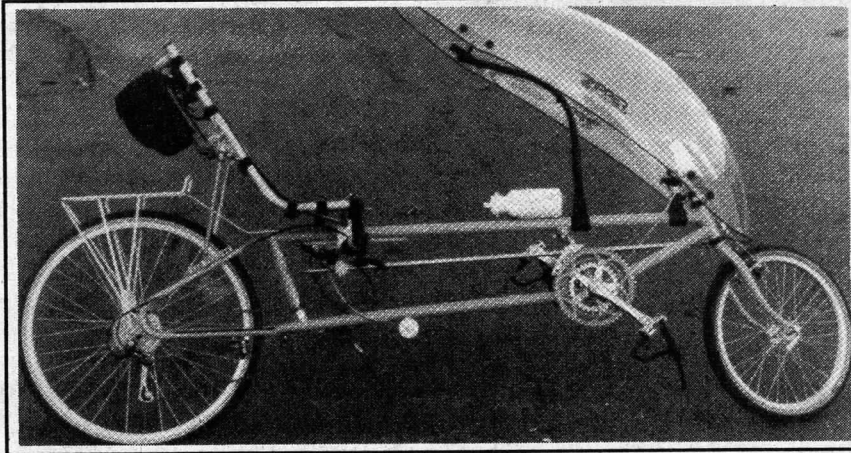
*Wow! Where do I start? First of all, your "RENEWAL DATE" is on your mailing label under your city, state or country. It should say something like "7/92 Renewal," this would describe a July 1992 renewal date.*

*Personal replies to everyone who writes RCM would be a full time job by itself. RCM has no paid staff and I just don't have the time to answer all letters, however, I do try to answer some and we go online to GENIE several times per week. GENIE is your best bet.*

*The speed issue is the most difficult question we as recumbent media, manufacturers and dealers face. It is a very complex issue. We are planning more "speed" articles in the near future. For a info on this subject, please reread and study from RCM#10— page 8, RCM#8—page 25 and*

*Do you think that the distance  
you travel should be determined  
by the amount of discomfort  
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RCM#7—page 7.

*RCM does not publish lies or misrepresentations. Much of what you read in RCM is editorial, whether mine or another writers. If you disagree with RCM's editorial content, please feel free to submit articles for publication. As for "more honest opinions," all of the editorial we publish is 100% honest and what we believe to be true-Editor.*

*PS: The last we heard, Peach Ridge was out of business. We've never seen or ridden a Slingshot.*

#### **LYCRA-HURLING QUASIMODO BIKE NAZIS**

Dear Robert:

(RE: the new Ryan Zipper Aerosock/ Lycra body) Thank you very much for your interest in the Ryan/ Zzip Design Aerosock. The prototype is nearly ready to be constructed, I hope to have a version for you to critique in a few months.....

.....I must give credit to Steve Roberts and Maggie Victor for getting me hooked on recumbents, as well as inspiration and a blazed trail to follow. Dick Ryan has also been most supportive by making non-standard parts to accommodate my physical requirments, and Karl Abbe of Zzip Designs who is making this a possibility. You, Robert, have also been very instrumental by providing critical information and "rays of truth" through a hype-infested world of lycra-hurling quasimodo bike nazis! Enclosed is my sub. renewal. Please, please, just continue what you have been

doing....

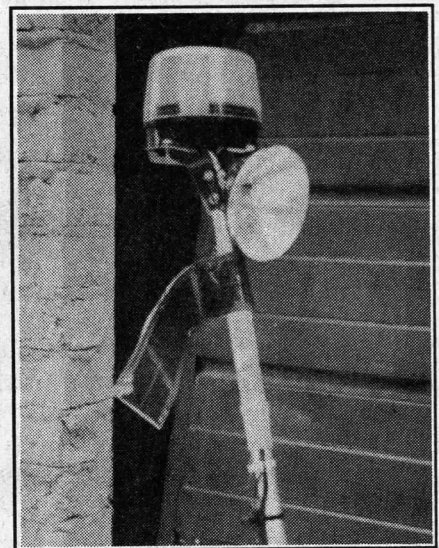
Yours truly,  
Danny Ray Burdick

#### **RECUMBENT LIGHT POLE**

Dear Recumbent Cyclist,

I am writing in response to the Safety Product Information article in the Jan.-Feb. '92 issue. I use my home-built, ATB-modified Easy Racer to commute 20 Km (12 miles) on extremely hilly dirt and gravel roads, frequently at night. I am quite concerned with visability from a distance, as cars and trucks in rural areas don't seem to expect me there. I believe you may be interested in my solution, which can be used on any recumbent.

I have designed the "Visability Tower" (see photograph). This light consists of a 6 Volt, 6 Watt halogen bulb in a



Recumbent Light Pole  
(Photo courtesy of Richard Ehrlich)

Union Parabolic housing, a Radio Shack 12 V. Security Strobe (running on 6 Volts) and a fluorescent orange Reflexite flag. It is powered by a 6V 4AH gell cell. Total cost was about \$75 Canadian. It sits just under 2 meters (6-feet) above the road, mounted on my rack. It is easily removed to avoid theft.

instinctively notice an eye level flashing yellow light, and it is visible above parked cars and over hill crests.

The head lamp offers a very bright, tight beam sufficient for night riding dirt roads. By reaching up, it can be raised to flash at oncoming cars who fail to dim their high beams, or lowered to illuminate poor road surfaces. It is bright enough that on-coming cars give great respect.

This system is very flexible in that it could be mounted on any type of recumbent bicycle on the rack or the back of the seat, or even an upright bike.

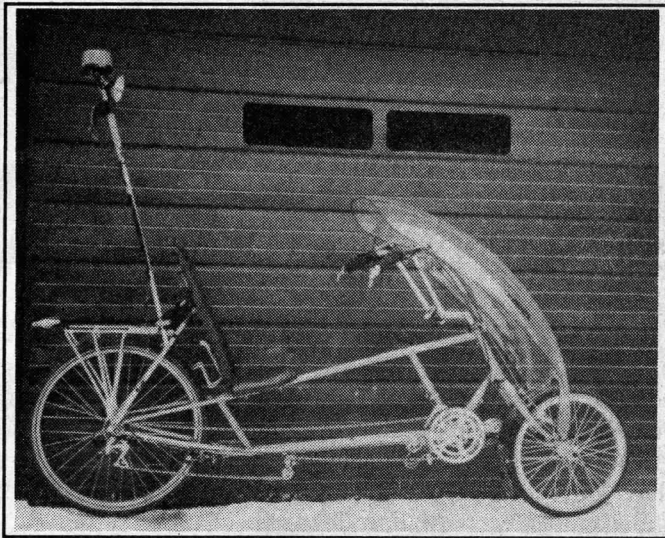
Sincerely,  
Richard Ehrlich  
Caledon Easy, Ontario, Canada

**SALES SUCCESS**

Dear Robert,

Please upgrade my subscription to first class.... I'd like to add that your "Recumbent Cyclist" classified ads work! My Tour Easy was sold even before I had received my copy of the magazine! I got a couple more calls later-sorry guys!

Recumbently Yours,  
Tom Briggs  
Waterford Maine

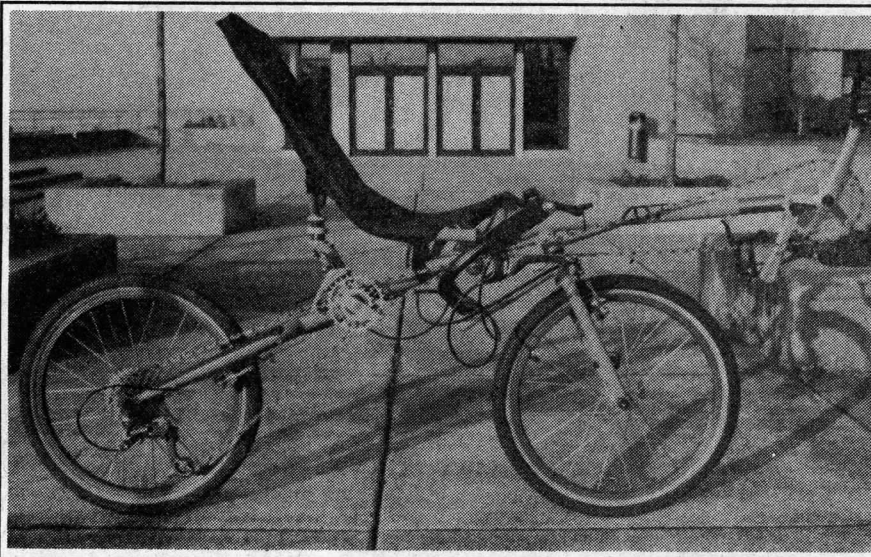


**Recumbent Light Pole**  
(Photo courtesy of Richard Ehrlich)

The strobe fires about 90 times per minute, and is much more powerful than the standard arm band type 1.5V. variety. It offers good 360 degree visibility on overcast or rainy days as well as at night. I feel that drivers

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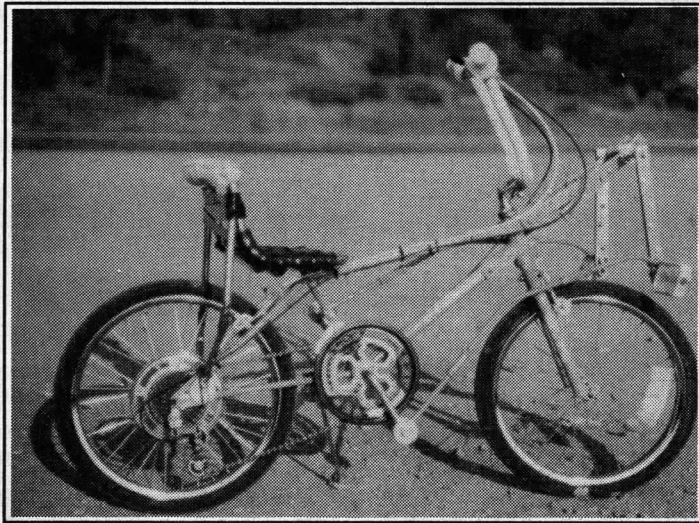
## LINEAR DRIVE

Dear Mr. Bryant

I talked with you a few months ago about my invention, the recumbent bicycle that uses a linear drive. I have enclosed a photo of it that shows the new multiple gear drivetrain.

Thank you,  
John Po  
1740 Summerwind Dr.  
Fullerton, CA 92633

*Please feel free to contact Mr. Po for more information on his BMX-linear drive conversion. If you would like printed info, please send along an SASE or postage.*



John Po's Linear-drive bike

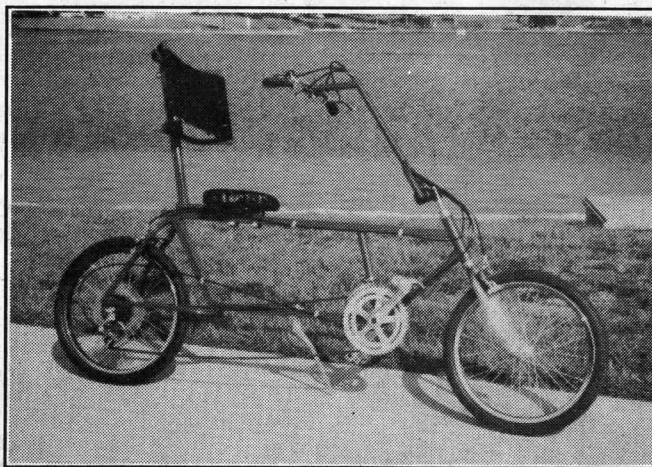
## ALTERNATIVE INNOVATIONS

Dear Robert,

I've enclosed a couple of photographs for your information with regard to my bicycles. Please run the photo of the blue bike (Alternative Bikestyles photo A) for the benefit of those who use the buyer's guide. The photo in the guide was not one of my standard bikes. It had been modified by both me and the owner according to his specifications. This bike, however, is a standard size medium frame bike. The differences lie in the seat, handlebars and rear wheel.

The rear wheel on my standard bike matches the front wheel at 20." For those who want it, the final gearing can be raised substantially by using a seven speed rear cluster with a 12 tooth small cog, and by using a 54 tooth front chainring (high gear=90 gear inches). I use the smaller rear wheel for aesthetics and to reduce the overall size to roughly that of a conventional bike. It also allows for attachments such as trailers and baskets to be attached behind the rider with no obstructions.

The handlebars utilize an extension and a mountain bike

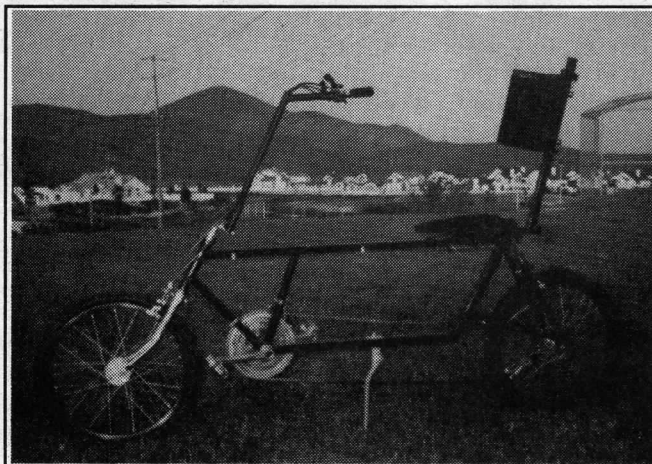


(Photo A) The 1992 Alternative Bikestyle's Maverick  
(Photo courtesy of Alternative Bikestyles)

handlebar. The extension is open at the top and bottom, so all cables can be strung through the tube. This greatly cleans up the appearance in front. It also allows the owner to upgrade to an alloy handlebar as he chooses (how many recumbent owners can walk into any bike show and get a new handlebar for their bike?).

The seat has a backbone of steel tubing, with a padded seat and a nylon backrest. Both are easily replaceable. The seat can be adjusted three ways: the back rest can be moved up or down, the pad can be moved forward or back, and the entire seat assembly can be moved forward or back on the frame. You can put quick release binder bolts on the seat frame and not even need tools to adjust it if you choose.

The red bike (Alternative Bikestyles photo B) is an experimental bike. It has the gearing mentioned earlier but also a difference in the chain stay. I moved them up where they attach to the frame, so the chain travels below the stay. This little trick was borrowed from the mountain bike people (E-stays-ed.). The seat pad looks flat because I tried a gel seat. It was better than some foam seats I've tried, but not as good as the foam I use



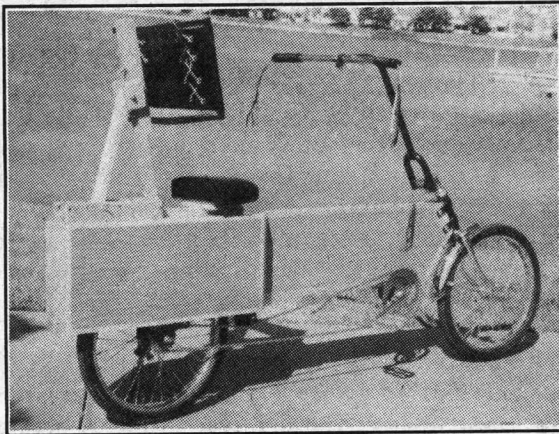
(Photo B) A prototype Maverick  
(Photo courtesy of Alternative Bikestyles)

now, so I've abandoned that idea.

I hope your readers find this information useful.

Sincerely,  
Ed Roeters  
Alternative Bikestyles

*Mr Roeters offers some very innovative and inexpensive recumbents. Framesets painted or unpainted in the \$200 range and complete bikes in the \$400-\$500 price range. For more information send an SASE to: AB, PO Box 1344, Bonita, CA, 91908. Ph#(619)421-5118.*



Ed Roeter's wood recumbent

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**EDITORIAL LICENSE:**

**RECUMBENT OPEN HOUSE:** On Saturday, May 16th, We had our first Recumbent Cyclist Magazine open house in Kent Washington. (We apologize that we couldn't list this date in RCM#10's calender, but print deadlines made this impossible.) Riders on our mailing list from Washington and parts of B.C. and Oregon were invited. Special guests in attendance were Dick Ryan of Ryan Recumbents, Kelvin Clark of Angle Lake Cyclery and Joel Smith of A.T.P. Recumbent riders were able to test ride any one of 30+ recumbents (part of the fleet courtesy of Ryan, Angle Lake and Millennium Cycle), meet with the 40 or so people that came by. The highlight of the day for me was being able to keep <most> of the group captive for a hour and a half long meeting and "State of RCM" speech. The day ended with 25 recumbents crusing down the Soo's Creek Trail, quite a sight. If anyone would like to join us for our meeting/ rides, please give us a call on the "hotline."

**MARKET REPORT:** Things are booming on the recumbent home front. In the commercial market, sales & deliveries are backing up again. Easy Racers is still riding the wave of popularity from the Bicycling Magazine road test, if you want one of these "Cessna's" better get in line quick. Kathie Skewis from ReBike and Steve Hansel from Linear report lots of sales action this spring. We have heard from several prospective recumbent manufacturers in the past 60 days. Here are some of the new bikes we've heard of but not seen: A) a LWB low down recumbent. B) a new faired custom aluminum recumbent. We hope to have this story in RCM#12. C) a fully faired commuter vehicle, this one is a year or two away D) a FWD prototype with two 24" wheels is being tested this summer, we hope to have info on this by Fall. E) A new upright steering recumbent, with a steel frame selling in two versions for \$599-\$999. F) a new Infinity? Keep your eyes out for these new bikes.

**HOTLINE INFO:** Our phone lines currently ring fifteen hours per day for propective and recumbent enthusiasts. The result is the expanding of our phone lines. We have added an additional line and given the axe to our "call waiting." If we can't answer our main line, you will automatically be transferred to our "B" line, if we can't get to that line, our voice mail will pick up. We also hope to have a FAX set up by mid-summer. The hotline is answered 8am-6pm weekdays, weekend hours are variable. If you would like to speak with me, it's best to try from 10am-6pm, Pacific Time.

Robert J. Bryant

**RCM INFORMATION**

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

**SUBSCRIPTION INFO:** The Recumbent Cyclist is the official newsletter of the Recumbent Bicycle Club of America and is published five to six times per year. To subscribe to the Recumbent Cyclist, please send \$25 to subscribe (First Class Mail-USA), \$20 Bulk Rate (USA) and \$30 world wide & Canada (USA FUNDS). The First class subscription will get you your issue 2+ weeks earlier than the standard rate. The club patch is also available from the RBCA office for \$4.00 each shipped. Back issues #2-#10 are \$4 each (one free if you order all 9 issues (Canadian back issue orders ad 25%, Worldwide Air ad 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 RC office so we can credit the source. If you can send your submission on computer disc, we use an Apple Macintosh (Microsoft Works 2.) 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:**

**R.B.C.A./ Recumbent Cyclist**  
17650-B6-140th Ave. SE, Ste. 341  
Renton, WA 98058.

**NEW RECUMBENT HOTLINE (206) 630-7200.**

**WANTED:** Information, photo's and experiences on front wheel drive recumbents. Your homebuilt recumbent stories (these get to press very quickly, because we don't get that many). Thoughts on LWB recumbents with two wheels of the same size.

**FUTURE RCM'S:** Here are road tests we have planned for the future: Rans, ReBike, Trice, QuadraPed, Infinity and maybe some new surprise bike news and tests. Always the latest in recumbent news and technology.

**DEVOTED PRODUCTION STAFF:** Editor & Publisher: Robert J. Bryant, Business Manager: Marilyn J. McKee-Bryant, Production Assistant: Jeanene Smith, Graphic Services & Printing courtesy of Desktop Publishing & Printing in beautiful downtown Renton, Washington.

**COVER:** The Counterpoint Presto, photo courtesy of Angle Lake Cycle. The new cover graphics were done by Mark Colliton, Kensington Design, Kensington, MD.

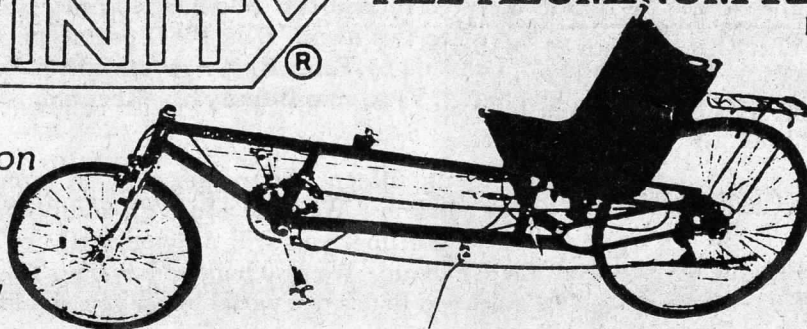
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**RBCA CALENDAR****JUNE 20, 1992****OHPV RECUMBENT MUSTER.** Beaverton, Oregon Call Rick Pope (503)244-0908. This is also an S.R.A. event**JUNE 27, 1992****SEATTLE RECUMBENT RIDERS.** Meeting and ride. Green River Trail in South King County. Meet at 11:30 am at the S. 180th parking lot. Call Bob Bryant (206)630-7200**JULY 17-19, 1992****DA VINCI DAYS,** Corvallis, OR. HPV Meet, Photo Gallery, Peoples Choice Awards, Time Trials and Parade. (S.R.A. event) Expanded Price List. For Info: Call Paul Atwood, (503) 752-6410.**JULY 25, 1992****SEATTLE RECUMBENT RIDERS.** Meeting and ride (see above). Call (206)630-7200.**AUGUST 5-9, 1992****INTERNATIONAL HUMAN POWERED SPEED CHAMPIONSHIPS:** Yreka, CA. Yreka is off of I-5 in the Shasta area of Northern California near the Oregon/ California border.**SEPTEMBER 20-22, 1992****INTERBIKE TRADE SHOW:** Anaheim, CA.**RECUMBENT RIDER GROUPS** (please send an S.A.S.E. with any correspondence)**WASHINGTON DC AREA: W.H.I.R.L.** (Washington's Happily Independant Recumbent Lovers) The brotherhood meets at the Viers Mill Rec. Center parking lot on Saturday Mornings around 8am This is a model rider group with No rules, No by-laws and No meetings, "Just a bunch of guys who ride cool bicycles together," says non-club non-organizer Vic Sussman. Word of Warning: No Lycra-Heads allowed. For more info contact: Vic Sussman at (301)897-5959 or Allan Pollock at (202)363-2244.**SOUTHBAY RECUMBENT RIDERS** (Los Angeles area) Riders meet at Burton Chase Park every third Sunday of the month at 10-11am. Contact :Tom Howe, 10634 Valparaiso #23, Los Angeles, CA 90034. Ph# (213)838-8634 or (213)377-8081.**OREGON HUMAN POWERED VEHICLES** (Portland area) Meetings, Muster's and a bimonthly newsletter. Contact: Jake Jacobsen (503)644-7038 or Rick Pope (503)244-0908.**MICHIGAN HPV ASSOC.** Meetings, race events and a quarterly newsletter .Contact: Gaylord Hill (517)263-5803.**HUMAN POWERED VEHICLES OF SOUTHERN ONTARIO** c/o Dennis Taves, 14 Croft St., Toronto, Ontario, Canada, M5S 2N8. Phone # (416)964-7857.**STREAMLINER RACING ASSOC.** (Washington/ Oregon areas) Several recumbent race events. Contact: Stewart Delaire (206)692-9738. Membership \$10 @ yr.**SEATTLE AREA RECUMBENT RIDERS:** (South King County) This new rider group will be meeting one Saturday per month in June, July and August for a meeting and ride. We will meet at the F & N Warehouse on S. 180th, 1 block west of the W. Valley Hwy/ Hwy 181. in the Southcenter area

### BOOK REVIEW: "RICHARD'S ULTIMATE BIKE BOOK"

I'm a glutton. When I see something delicious I have no self control. When I saw "RICHARDS ULTIMATE BICYCLE BOOK" by Richard Ballantine and Richard Grant my first thought was, "oh, I should grab that." Then I checked the price, \$29.95 US. I said, "Oh well, another time perhaps" and set the book back down.

I have this other problem. It's about bookstores. I can't leave one empty handed. When I cruised by the book a second time, I opened it. That's when gluttony kicked in. Richard's book is a sumptuous feast for the eyes. More than that, if you are into recumbents, HPV's and such it's unlikely you have seen anything like some of the photos in this book. It's the quality of the photos with pin point detail. Having seen so few of these machines 'in the flesh' I was enthralled.

My first exposure to the world of recumbents, aside from my neighbors' LBjr. was a previous edition of Richard's Bike Book. I was snared by Richard's description of Mike Burrows' Windcheetah. The Windcheetah is in this edition as well. On the second page of the chapter devoted primarily to recumbents sits a totally disassembled Windcheetah SL Mark IV "Speedy". Every nut, bolt and washer is laid out to ogle.

The following pages offer glimpses of two more "Speedys" the Kingcycle Bean, the Peer Gynt II (an Avatar-like looking machine from Germany), Wim Van Wijnen's Ecocar 2000, the fabulous Swiss Twike and more. As a longtime subscriber to the famous Recumbent Cyclist, I was already familiar with most of these machines. What

Richard's Ultimate Bike Book adds though, is the phenomenal quality of the photographs. In incredible detail you can appreciate all sorts of design and fabrication features. You feel at times like you could almost reach out and touch them.

The authors don't try to answer every question or even show every style of recumbent and HPV but rather attempt to light a fire in the imagination of readers not already familiar with such machines. They offer the initiated a better glimpse of the kinds of machines they may already be dreaming about.

I should hasten to add that most of the book features the standard bicycle design of the present and past. For many longtime avid bikers, little new will be found. A lot of the writing seems to be aimed at the general reader possessing little or no knowledge of the world of bikes (who is that cretin?). Still enough ground is covered to include something of appeal to any reader with any interest in bikes.

This is mainly a coffee table book that does an excellent job at that. An 'ultimate' bike book it's not. To cover the multitude of bike topics in the intimate minutiae deserved of a tome labelled "the Ultimate" would require volumes. Still, I appreciate the authors for what they have done with this book for bicycling in general and for recumbents in particular.

by Michael Brisson

*Michael owns a Trice Trike and two Alternative Bikesyles Recumbents.*

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## AN HPV MADE OF PAPER

I have invented an HPV that can be built in a matter of seconds, to almost any configuration you can imagine. I can INSTANTLY see the effects of adding a fairing, what happens to my speed when I add a third wheel, a second driver, knobby tires or a host of other options. What is it?

It's a P.C. simulation of an HPV. I originally wrote it for High School students who compete in an annual "Midwest HPV Classic" the last weekend of April, in Columbus and Mooresville, Indiana. (Contact Person is Don Berry of Infinity Ph.# 317-831-8798 for more info). We didn't want to tell the Shop and Science students what works and what doesn't and on the other hand, they have a fixed amount of time and money to build their HPV's in class. The fewer "rebuilt" the quicker they can get in out on the track.

(By the way, if you teach Welding or Science and need a way to motivate students—announce an HPV race!)

By trying out each student's "design" on the computer, they could quickly see which had the greatest speed potential. In fact it can turn into a group brainstorming session in front of the screen.

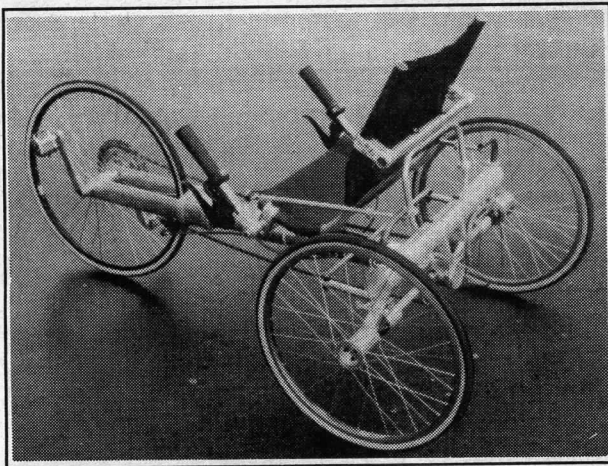
Technical information in the program was taken from "Bicycling Science" by Frank Witt and David Gordon Wilson. With the data and equations in this book you can write your own program, or if you'd like to save yourself a lot of time (and headaches) for \$5, I'll mail you "HPV.EXE" on a floppy disc ready to run on your P.C.

I welcome any suggestions or ideas. If they're good enough, I will give you one year's free membership in an Engineering Shareware Club where you can exchange ideas and programs with others.

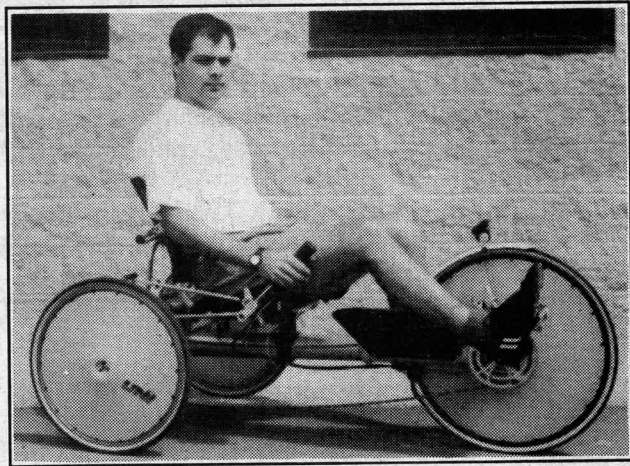
by Bob Malcomb, P.E.

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## RECUMBENT COMPUTER VIRUS SPREADING!

Can't get enough of the absolute latest news on recumbents from all over the world? Got a computer and a modem? Then log onto GENie in the SPORTS Roundtable, CYCLING Category, Recumbent Bikes and Cycling Topic Group and catch the fever while sharing conversation with Robert Bryant and a host of other rabid recumbent writers and readers.

GENie is the General Electric News and Information Service and functions somewhat like Prodigy, Compuserve and others in being a computer accessed communications service. GENie offers E-mail, software libraries, travel and information services and the Roundtables.

The recumbent corner is a place where recumbent owners "gather" to share information, conversation and comradie on our common subject.

To join the conversations, in addition to owning a computer and modem and some communications software like ProComm etc., you must also be a member of GENie. From most major urban areas of the continental U.S. you can access GENie through a phone network that allows you to avoid long distance charges. Once you are online GENie costs \$6.00 @hr. non-prime time (6pm-8am and all day weekends and holidays) or \$18.00 @hr. prime time 8am-6pm M-F.

GENie also offers a very economical budget plan which for \$4.95 @month allows unlimited non-prime time usage of a specific group of basic services which includes access to the bulletin boards and Roundtables (also E-mail by the way!).

To log on set your software to 1200 (or better yet 2400) baud, half duplex (local echo) and dial 1-800-

638-8369. After you connect to GENie type HHH. You will get a prompt from GENie that appears as: U#= Type xtx 99514, GENIE and press return (or enter). The system will start asking for personal information so have a credit card ready. You will be given an account number and other instructions to process your account.

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Log on to the GENie news and information service and join the "Recumbent Bikes and Cycling" topic group. We're in the Sports Roundtable, Cycling Category.

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2. Dial toll-free 1-800-638-8369 (in Canada (800) 387-8330). Upon connection type HHH.
3. At the U#= prompt, type SIGNUP and press return.
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Share the latest news with other recumbent owners and enthusiasts from across the continent.

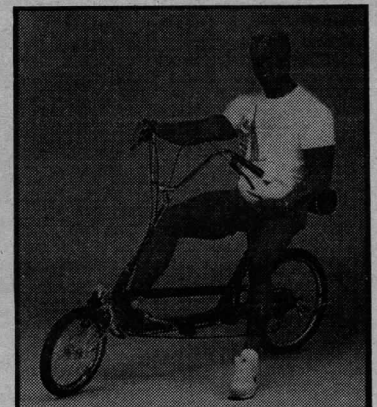
by Michael Brisson

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**RECUMBENTNEWS**

**BICYCLE MANUFACTURERS EXPERIMENTING WITH RECUMBENTS?** We continue to hear this from several different sources. Could they be preparing for the end of mountain bike reign, or the next step beyond hybrid/cross bikes? Has anyone else heard or seen anything? What type of impact would this have on the current recumbent market?

**HPV FRAME BUILDING:** For a growing number of cyclists, the kind of bicycle frames found in stores just aren't quite right. Maybe it doesn't fit right or have the accessories they need. Maybe they just want a special paint job. "Some come simply to watch their frame being built, and others come to learn a new profession," explains owner Tim Paterek "Some students come with a strong background in machining, brazing, inspection and painting. Others come wanting to learn how to light a torch." For a brochure write: Tim Paterek, Rt. 2, Box 234, River Falls, WI 54022 or call (715)425-9327 *Tell them your read about it in RCM!*

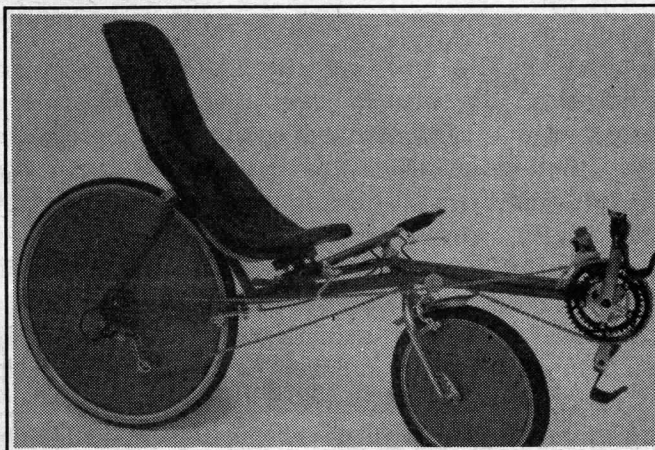
**INSTANT TRIKE:** The Mathews Company recently announced the introduction of a five-speed coaster brake version of its tricycle conversion kit, designed to convert and cycle into a tricycle. The hub is a Sachs Pentasport five-speed internally geared. With a little ingenuity, a double or triple crankset could be added. Mathews Ph#1-800-525-4444.

**WINDCHEETAH HUMAN POWERED VEHICLES:** After a seven year absence, you can now order you factory built Burrows Windcheetah. A "LIMITED EDITION" version to include a Carbon/ Kevlar seat, bronze anodized frame tubes, Deore XT derailleurs, Aero rear rim, SPD pedals and shoes, Sedis Gold Chain, Vista Lite Safety Lamp, Limited Edition Brass Plate and seat cushion. This rolling HPV legend can be yours for £1400. Overseas shipping can be as high as \$300-US. CSS Burrows Engineering Ltd., 11 Basey Rd., Rackheath Industrial Estate, Rackheath, Norwich, NR13 6PZ.

**ZZIP DESIGN:** The latest word from Karl Abbe, America's foremost fairing designer and builder is a new fairing for the Ryan Vanguard that includes a Gold Rush Replica type Lycra body stocking. The prototype is currently being tested. Karl also mentioned that a customer mounted a long Zzipper Fairing on a SWB recumbent. Another notable is the new Zzip Thriller a Super Zzipper for your upright mountain. For all HPV and custom fairing applications, give Karl a call at (408)425-8650.

**J. BENDITT CO./ BIKE-TRIKE/ R.E.M./ PRELUDE:** Probably the most interesting HPV brochure around is J. Benditt's. His latest offering is the BikeTrike, a human-electric vehicle that can be ridden with two or three wheels. For more information, send S.A.S.E. To: J. Benditt Co., PO Box 335, Pennsboro WV., 26415 or Ph#(304)758-2643.

**TURNER LAID BACK:** The new Turner LB-2000 is now available for delivery. Price includes: painted frame, fork, Kevlar seat and chro-moly handlebars. \$1100 from Turner, PO Box 36158, Los Angeles, CA 90036 Ph.# (213)383-0030.



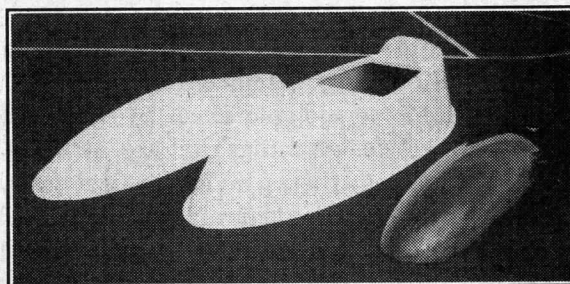
The new Laid-Back 2000  
(Photo courtesy of Turner Enterprises)

**FINALLY A SEXY BODY AT AN AFFORDABLE PRICE!** BLUE SKY DESIGN announces the limited availability of aerodynamic body shells for human powered vehicles and ultralight electric cars. The **AEROCOUPÉ Body Shell** kits designed as a generic aero form that can be adapted or modified to fit many tricycle and cyclecar chassis layouts. Molded of tough A.B.S. plastic, the shell consists of an upper aeroshell and lower pan that are fastened to each other and a chassis to form a light and strong body. Also included is the blown acrylic tinted canopy. The entire body kit weighs under 25 pounds and has an estimated Cd. of .20. Dimensional specifications, photos, and ordering information is available for \$3.00. Blue Sky Design, P.O. Box 2014, Thousand Oaks, CA. 91358-0912. Contact person: Mark Murphy (805) 498-0958.

*Mr. Murphy is the builder of the Aerocoupe and Chassis Cycle recumbent trikes from the past. Word has it that the Chassis maybe back in production soon?*



The Blue-Sky design body shell mounted on an Aerocoupe

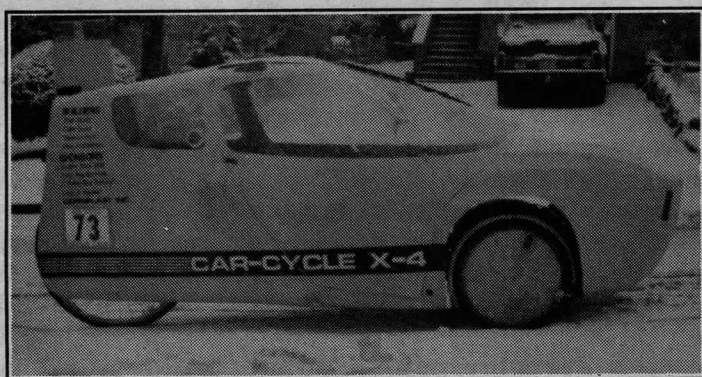


The Blue-Sky design Aerocoupe body shell  
(Photos courtesy of Mark Murphy)

## COROPLAST HPV BODY CONSTRUCTION

By Bob Stuart

Last year, I had the opportunity to make another HPV body in Coroplast, the some Polypropylene extrusion resembling corrugated cardboard that was used for the front and back of the Car-Cycle X-4. This time, the job was to enclose a Quadratrike from Richard Rau for a fund raising trip around the World, Cody Anderson's Pedal for Life expedition. The specifications emphasized low, low weight, and a vague resemblance to the Space Shuttle Columbia. I decided that extreme ruggedness, within the weight allowance, would also be a great virtue. At 15lbs., the body came out a lot lighter than Cody expected, and after he rolled it onto its side on grass without causing any visible damage, I decided that it was tougher than I had hoped.



Bob Stuart is the owner-designer-builder of the Car-Cycle X-4

The first step was to convince my plastic dealer that a lighter gauge of Coroplast could be had. The factory calls it "fine flute", recognizing the closer rib spacing; the sellers say it is "2mm", for the thickness of the specimen that they soon found in 4'X6' sheets weighing only 2lbs, or half the usual weight. Other weights and thicknesses, from either of the two standard dies, are mentioned in the factory brochures. You can probably find free samples and/or full sheets of the standard stuff at a sign shop, and some lumberyards also have it. Coroplast comes in translucent, white, yellow, sky blue, and several muddy "background" colors. It will seem pretty floppy at first, but it stiffens up quickly as curves, ribs, bends, or extra layers are added. You can get a good idea of the possibilities and techniques from cardboard shipping boxes and liners, and from the cheapest furniture.

Once I had the lightweight sheets, I make up test pieces for the Coroplast reinforcing ribs until they were VERY hard to break by brute force and ignorance. By suppressing my hard-won ability to design things that are light and stiff, I found that I could make them a bit less geometrically rigid, so that by buckling they would be able to bounce back from severe distortion instead of stiffly resisting and then fracturing. This is the same principle that allows grasses to co-exist with feet. Then, since the structures

were getting a bit thick and heavy in developing enough stiffness so as not to appear alarming, I added a bit of fiberglass, and tested again. A few ounces of glass did wonders for the strength and stiffness, and then would break away, letting the Coroplast buckle and bounce as before. Often the thin sheet of delaminated fiberglass could also buckle independently, and snap back ready to be glued back on. If the glass broke, it would only need a small patch for restoration. I wound up using several different types of Coroplast beams, according to the space available. For the window sills, six layers of heavy gauge Coroplast were glued together with the ribs in each layer at 90 degrees to the next, and the length of the beam at 45 degrees to both. The open ends of this honeycomb-like assembly were trimmed to the body contour. A single layer of unidirectional fiberglass was sandwiched between this and the body side. A second strip of glass could have been used on the interior side to add stiffness and finish. Ahead of these reinforcements, a single sheet of 2mm Coroplast was used as a dashboard, with the back edge folded and glued to make a tube.

The wheel wells were outlined with layers of 2mm Coroplast stepped back to lay in a single plane yet support the curve of the body. In order to conserve material and keep the grain roughly parallel to the opening, these layers were built up from short arcs with the joints staggered. Some parts of the wheel wells had an inch-wide strip added on edge to make a stiffer "T" section where it didn't interfere with anything.

Behind the rider, where there was more room available, a deeper, more efficient section was used, with a single hoop running all around the inside of the body and connecting to the body mounts on the chassis. Here, two layers of 2mm Coroplast were used for a box section about 1" inch wide and 3" deep. The layers were set at 90 degrees to each other, and 45 degrees to the length of the beam, making an efficient shear web. A single strand of fiberglass roving was epoxied between layers in each fold line. This produced a deep C section and the open ends were then trimmed to the contour of the inside body. Then 1/2" wide strip of unidirectional glass, a bit rich in epoxy, was folded over the open edges. Next a 2" wide strip of 6oz. bi-directional fiberglass tape was laid up on the inside of the body panels, and the still-wet beam clamped on. The small gaps were adequately bridged by the unidirectional strips and epoxy. The joints in this beam were reinforced with fiberglass and epoxy.

In places where two pieces of Coroplast were joined flat, or just a bit of extra stiffness was needed, a backing strip was

fastened with double-sided carpet tape. The factory recommends thick, foam-center tape to press into the spaces between the ribs better, but I got away with the lighter, thin stuff. The factory is also unconvinced of the reliability of cyanoacrylate (crazy glue) or epoxy. My good CA didn't stick, but I trust the Gougeon Bros. WEST epoxy after the bonding surface had been cleaned with lacquer thinner. It will peel, but not too easily. If the surfaces have not picked up any fingertip oil or other contamination, a dry wipe may be best, as the factory gives each sheet a strong charge of static electricity to attract paint. I had also used water base contact cement with good results on the Car-Cycle, but apparently it can shatter at temperatures below freezing.

Regular clear Silicon Seal gives the best bonds of all on Coroplast, the colored silicon is probably fine, but the waterbase, paintable stuff is useless. If you don't mind a bit of extra weight, silicon can be built up into very tough butt or T joint fillets. Always remember, though, that only more silicon will stick to a surface that already has even a hint of silicon on it.

For the single-plane curves (conic sections) of the body, I used the technique of slitting the Coroplast on the inside, bending it to shape in a minimal fixture, and laying on a single layer of 2oz. fiberglass cloth with WEST epoxy resin. I found that there is a noticeable difference in the thickness of the faces of thin Coroplast, so I slit the thinner side. The tool of choice for slitting is an Olfa knife with a blunt tip produced by a few attempts to slash through a concrete floor or a whetstone. The knife is held at a compound angle so as to slice cleanly through the plastic, leaving slanted edges that will ride over each other as the sheet is bent. The blunt tip keeps the cut at the right depth. For gentle curves, not every cell needs to be cut to produce an acceptable smooth surface. The final product is reasonably tough and resistant to anything except a pinch. To guard against that, or could use 6oz. cloth, more Coroplast, or tiny reinforcing ribs.

In areas where a compound curve would be ideal, such as the nose cone and front of the roof, I used several strips of Coroplast, giving a shape similar to cloth stretched over a framework. The first few stripes were bent over cardboard ribs, and the rest were formed by support at only two or three points. The strips were cut with an unmodified Olfa knife roughly parallel to their ribbing, and it took some practice, low cunning, and often several passes to get a smooth line cut. Each strip was then held in alignment to its neighbor with masking tape on the outside. Next, the seam was backed up by cross-grain strips of Coroplast glued on with Silicon Seal. The cross-grain strips were cut almost across at regular

intervals, making a chain of approximately square blocks held together along one edge. This makes them easy to handle in mass and able to follow a curve and stick to it with just the wet silicon. After the silicon had dried, the masking tape was replaced with vinyl tape to give a finished surface. This tape is sold in small retail lots as 3m#190, and in big rolls by wholesalers as 3m#471. Many different widths and colors are available. This is the only tape I know of that will stretch nicely over a curve and then stay put instead of shrinking back. Duct tape also works, but is rougher and less reliable, especially around solvents.

For the windshield and side windows, I got some generic polycarbonate, .03" thick X 4' wide from a roll. It seems to be much better than GE's Lexan brand polycarbonate. I used a cheap strip heater to arrange the vertical ends, and glued the windshield in with silicon seal, taking a chance with the effect of acetic acid on this very tough clear plastic.

The body shape as a whole was set by a 1/4" plywood profile and a number of cardboard formers. Unfortunately, even "measure five times, cut once" left about 1 1/2" to be fudged when the body was finally joined to the chassis, and the jig is not able to make replacement parts that would not need some hand fitting. The third body mounting point is at the front, with everything between a self-supporting monocogue. The door function is performed by hinging the roof up at the back and removing a side window.

I am very satisfied with the finished product, and with the ability of Coroplast to hold its shape against the wind, while yielding and bouncing back from most other encounters. In this application, toughness is far more important than strength or stiffness. I also think that it can be vacuum formed into smooth compound curves. I did a little sample in my kitchen, so it shouldn't be too hard to do it industrially, making even better fairings.

Making custom fairings this way is rather time-consuming, but it has the advantages of using very little extra material in the process, and producing finished parts early on in the process. You can also build right on the chassis, designing the details as you go.

SAFE AT ANY HEIGHT

I have read with some dismay several references in recent issues of *The Recumbent Cyclist* to the effect that lower bikes are unsafe. Instead of perpetuating old wives tales let us correct that misconception with facts. Those in our society who are Politically Correct will find fact and measurement uncomfortable concepts but they have served well in the technical community for several centuries. Table I summarizes the bicycle measurements.

Table I  
Bicycle Height Measurements

Model	Top Tube (inches)	Eye (inches)	Helmet Top (inches)
Avatar	21	49	57.5
Counterpt II stoker	24	53.75	62.25
Counterpt II capt.	32	63	72

rider is 6' 0" wearing Bell Biker helmet

I judge the Avatar (16" front/27" rear, LWB) about average for recumbent height. I judge the Counterpoint (20" front/27" rear) recumbent position to be on the high end of the range and the captains position to be a normal diamond frame mountain bike riding posture. Undoubtedly, there are some recumbent configurations that would be lower than the Avatar. Inspection of the table shows recumbent positions lower than diamond positions which is a relief since that was the whole idea of a recumbent in the first place.

Table II shows the equivalent measurements for the same rider in several four wheeled, iron boxes:

Table II  
Bicycle Height Measurements

Model	Eye (inches)	Roof Top (inches)
Chev Celebrity	45.5	55
Ply Duster	44.5	54.25
Dodge Aries	45.5	54
Dodge Daytona	42	51
Fiat 850 Sport Coupe	38.5	47
Fiat 850 Sport Coupe	36**	47

\*\* measured with 5' 2.5" secretary

The first three are typical of what now passes for a full sized car. Note that the eye and roof heights are all lower than recumbents. Note that the eye and roof height is noticeable less than recumbents. I threw in the short gal in the fiat just to show what value you

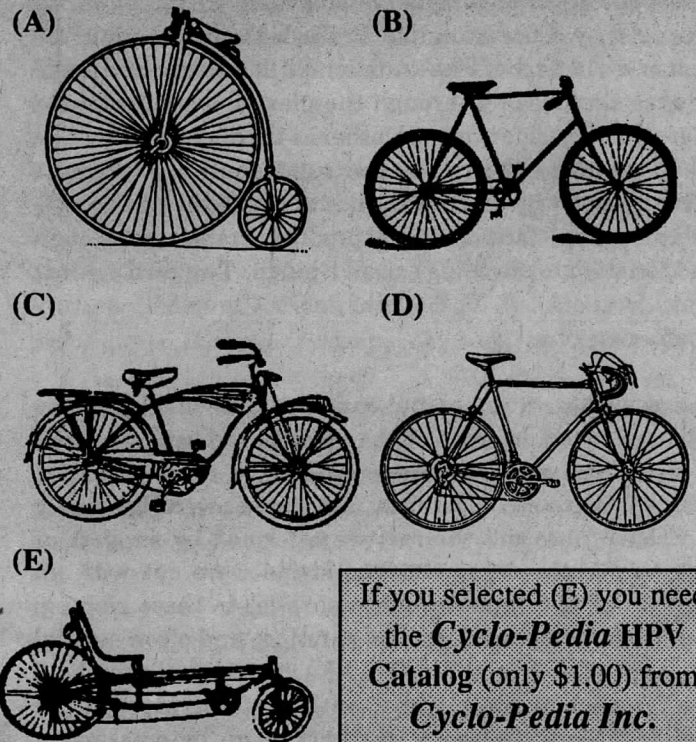
would get for the lowest height.

The obvious conclusion is that the average rider on a recumbent is at least as high, if not higher, than almost all of the cars on the same road. Yes, the recumbent is lower than a pick-up truck but so are the cars and that fact does not seem to bother most people.

In my 40,000 miles on the Avatar no one has ever made any remark to the effect that I was hard to see, although they certainly remark about everything else. Besides dressing in bright colors, I also operate it as a legal road vehicle, ie, ride in the lane, make left turns from the left lane, signal turns, stop at stop signs/lights, etc., etc. On the other hand, if you wear camouflage clothes, have a bicycle inferiority complex and hug the non-existent shoulder, pass cars on the right, run intersections, etc., then you will be Unsafe At Any Height.

Monte Crippen  
Kennewick, WA

In the history of cycling where are you?



If you selected (E) you need the *Cyclo-Pedia* HPV Catalog (only \$1.00) from *Cyclo-Pedia Inc.* P.O. Box 884 Adrian MI 49221



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**WANTED:** FWD recumbent project, complete or parts, contact RCM, see back flap of this issue for address.

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**BOOKS AND MISC.**

All new **Cycle America Regional Directory for the Central Coast of California** featuring 8 pages of color fold out bike road maps and places to eat, sleep, shop and recreate from San Jose to Santa Barbara. Special section on recumbents! Help build a TransAmerica Bicycle Greenbelt. Pocket size. Only \$7.95 to Cycle America, 147-River Street South, Suite 222, Santa Cruz, CA 95060. (408)426-7702.

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**FOR SALE: SUPER ZIPPER FAIRING** with mounts. Excellent condition. Adapts to most recumbents. Disassembles and rolls up for transport. \$195. OBO Ph# (415)665-1520 CA.

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**FOR SALE: Time Touring pedals and shoes.** These are the top of the line "Century" model. Pedal attachment points recessed, so shoes are walkable. "[This system gets] our highest recommendation," (RCM #10). Almost new, (used twice). Pedals \$125.00 (retail \$180.00). Size 43 shoes (US 9 1/2) \$80.00 (retail \$165). Scott McMahon (415)-856-2254, or write 2250 St Francis, Palo Alto, CA 94303-3133, or personal letter on GENIE to S.MCMAHON7.

**RECUMBENTS**

**FOR SALE: Laid-Back "E" RCM test bike,** New never ridden, Black large 12 speed, with thumbshifters, **SOLD** 3/8" alloy wheel, 26" rear wheel Package deal \$699 + shipping. Millennium Recumbent Cycles (206)630-7200

**FOR SALE: Rotator, "handcrafted human powered transportation"** The Companion Tandem, designed for fun, it can be built with underseat or overseat steering. The gear systems can be built with a standard timing chain or the more efficient individual cadence option. Seats adjust for rider height. 20" wheels front and rear. Seat height 25", overall height 48" and overall length 86". Base price \$3000. The Super-7, designed for racing with a streamlined body. Points series Winner for 1989, 90 and 91. Works great around town too. 20" wheels, seat height 15", height 36", length 88" Base price \$1500. Custom fabrication also available. Rotator, 915 Middle Rincon Rd., Santa Rosa, CA 95409, Phone # (707)539-4203.

**USED RECUMBENTS**

**FOR SALE: Brike Model 2000,** brand new-assembled-but never used. Adult three wheel recumbent trike. Fits riders 5'2"-6'5." Cost \$250+shipping, Sell \$175. + shipping charge. Write: Brian Chase, RR#1, Box 2080, NewFane, VT, 05345 or phone#(802)365-7929.

**FOR SALE: 1991 Tour Easy, Red Medium,** Custom gears, Deore XT, Super Zipper, refinished seat Blackburn rack \$1200. Call Jim: Ph.# (719)683-2829. (CO)

**USED RECUMBENTS (cont)**

**FOR SALE: 1991 used 42" Linear Recumbent** \$629 shipped anywhere in the USA. New '92 Linear's from \$939. **1992 Rans Nimbus RCM** test bike. 37" (med.-Lg.) frame, set up with Deore XT Der. & shifters. Closed Cell foam seat, upgraded stiffer bars, fairing, blue and perfect! \$1099. Millennium Recumbent Cycles "Recumbent Hotline"(206)630-7200

**FOR SALE: Infinity Recumbent.** This bike has been set up for long distance touring. 21 speeds with Shimano Deore II index shifting, rack, bottle cages, Esge fenders, Stronglight "Delta" headset, Magura "Hydrostop" brakeset, T.A. Crankset, Am. Classic hubs and Am. Classic boom bracket. Price \$750. Al Christian (815)338-1270. (IL)

**FOR SALE: Trice trike.** Delivered new in January '91, 400 orig. 1-owner miles, rack, fenders, computer and white paint. Won't last, \$1059 + shipping. Millennium Cycles (206)630-7200 (WA).

**FOR SALE: 1990 Laid-Back "LB'90.** Pearl white with pink accents, XCD components, 12 speed (easily adaptable to 18 speeds), 700c rear wheel, 16" X 1-3/8" front-hand built wheels, Grip Shifts, Dia Compe side pull brakes with X-1 levers, Aztec pads and UNI discs front and rear. Former RCM show bike. \$750 + shipping. Call Eric (206)943-5945 (WA)

**FOR SALE: LEMLE LIGHTNING CYCLE TAILWIND:** A very special bike, built for HPV News article in mid-1990. Less than 200 orig. miles, blue Imron paint, Shimano Deore crank with black chainrings, Shimano 105SC brakes, XT brake levers, 20" X 1-1/8" front & 27" rear wheels, two custom Lightning racks (one with a collapsible box) and a custom built seat that is higher (high-back) and more upright than stock, this includes a brand new Bel-Ami (Counterpoint Presto style) seat. This custom work was all professionally done. Own this one-of-a-kind-bike for \$959+shipping. Millennium Cycles (206)630-7200. (WA)

**FOR SALE: Ryan Recumbent,** under 1000 miles, Owner can't get used to helmet mirror; bike in perfect condition. Fire engine red. Blackburn rack and cyclecomputer included. \$800 or best offer. Write or call nights and weekends: Carl Berkowitz, 544 Franklin St., Richland, WA. 99352. Ph#(509)375-4740

**FOR SALE: 1991 Ryan Vanguard Zzipper Fairing** \$995. "An excellent adventure." Call John Ph.# (719)683-2713. (CO)

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**The original Prelude Electric Recumbent Bike** This bike effeciently mates human and electric power, also it has full energy storage capabilities. It has regenerative/ muscular energy stoage capabilities, a 2HP PM motor, 108 speed bike transmission, custom derailleurs, dog-clutch and dual brakes. Top speed is 45+ MPH, weight 90 pounds. Simple to operate, one-of-a-kind original. Asking \$3500: J. Benditt, PO Box 335, Pennboro, WV, 26415.

**RECUMBENT PERSONALS**

**WANTED: HPV riders** who want to pedal together from the Seattle area to Yreka CA. for the IHPSC (Speed Championships). Leaving around August 1st. Call Jay Gladstein Ph.#(206) 325-2941.

**MISC. FOR SALE**

Welcome to **TUDOR HOUSE GIFTS** Limited Time Mail-Order Sale! Quantities are limited. **SPORTS 2020 WATCH-ONLY \$6.95.** This lightweight watch is stylish and good looking, yet built to take on the rigors of your favorite sports activity. LCD Display, The case and band are jet black, and it has green, blue, yellow and gold accents. It's water resistant and has a calendar, alarm, it chimes on the hour and it's a stopwatch! \$6.95 ea. Item # 10030.

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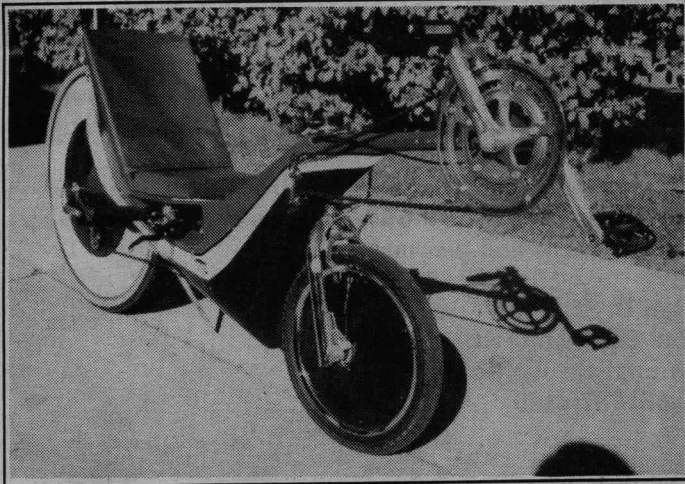
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**HOMEBUILDERS CORNER**

by Ran D. St. Claire

I am a newcomer to HPV design and an electronics engineer with many years experience as a model aircraft designer and builder. Recently, I decided to build my own bicycle, and given that making something normal is boring, I ended up with a recumbent.



Ran St. Claire's SWB recumbent

The bike is fiberglass over foam construction using conventional glass cloth and epoxy resin. It weighs approximately 36 lb.. and could be considerably lighter, especially with the use of carbon fiber or Kevlar.

There is no steel frame inside, only brackets which distribute the loads into the fiberglass shell at critical points such as the rear wheel mount, steering tube, kickstand, etc. The steering tube angle is a little high, so steering is very quick with a light feel. The brakes, derailleurs, pedals, etc. are all standard bicycle components. The steering is under the seat remote through a push rod with hyme joints. The steering is thus smooth and free. The rearward underseat handlebars are very comfortable and relaxing. The seat is custom made and form fitted. The seat back is standard Dacron sail cloth stretched over the body and glued along the edges.. The bike has an epoxy paint job so the glue can be softened with laquer thinner and the seat back replaced at any time. Dacron was used for its low stretch properties. The trunk is an integral part of the body and can be locked. It contains the chain, lock, pump, repair kit, etc.

The bike has a wheel base of 39" coupled with a steering range of (+) or (-) 30 degrees which gives the bike the ability to do 360 degree turns within my driveway. The weight distribution, including my weight is nearly balanced with 52% on the rear wheel, and 48% up front. The brakes are a little weak due to the smooth steel front wheel, but it will come to a stop from 15 mph in under 11ft.

I have ridden it over 175 miles thus far, mostly at night, so I have hit my fair share of man hole covers and pot holes



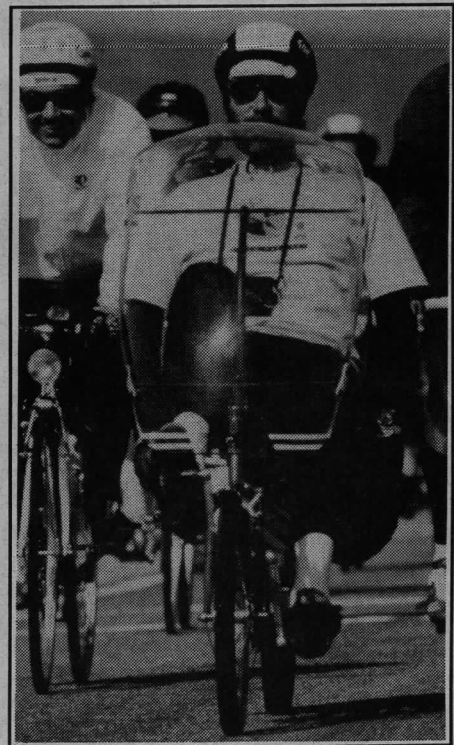
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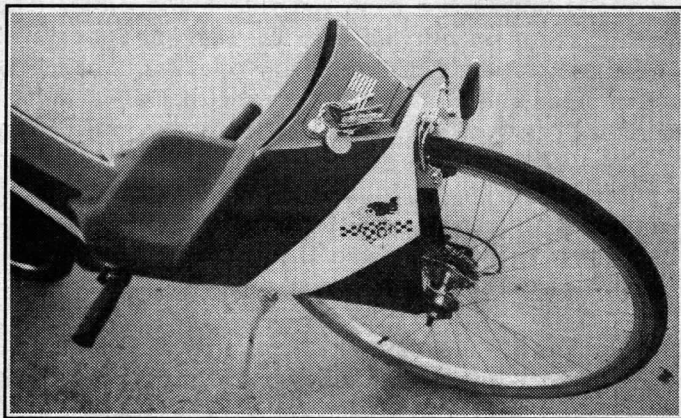
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"Danny Ray  
Burdick pictured  
at the helm of  
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equiped Ryan  
Vanguard  
Recumbent"



and thus far I can see no evidence of any structural failure. I am more of a bike builder than rider, but I'm still able to push it to a top speed of 26 mph on the flat. Actually, the lack of top end is what uncovers the two main flaws in the design. The pedals are a touch too high, and I believe I am losing a lot of power due to friction in the chain bending and unbending as it goes over the pulleys that redirect it under the seat. Perhaps it is just my lack of conditioning, but having the pedals too high seems to cause some sort of a



Ran St. Claire's SWB recumbent

problem with my legs, making them tire quickly. So far I have only had a chance to ride one other recumbent, the Laid Back'90. Based on my short ride on the LB90 I would guess that it is somewhat faster than my bike. The design I am currently working on has a more conventional metal tube frame construction. The drive sprocket is under the seat in a location similar to a conventional upright bike. Power is applied through push-pull rods from swing arms in the front to the crank arms below. That way I figure I can put ball bearings at either end of the push rods to minimize friction losses, and the weight of the aluminum tube pushrods should be less than the chain. Has anyone had any experience with such a drive system?

Other innovations that I am looking at are ways to make use of arm power and the use of internally geared hubs such as the Sachs and Sturmey Archer.

Ran D. St. Clair  
742 San Rafael St.  
Sunnyvale, CA 94086  
(408) 737-1160

## FACTS & FICTION ABOUT CLIMBING HILLS ON RECUMBENT BICYCLES

What about going up hills on recumbents? I hear they're no good?

Pedaling up steep hills on a recumbent is tough until you build up our thigh and hamstring muscles. You cannot stand

on the pedals like you can a regular bike. You absolutely must spin, This is good cycling practice to prevent knee trouble.

Once you are conditioned, you may be able to go up the same hill faster than YOU could on a regular bike, because:

1) You can use more muscles to pedal with, not just your quads.

2) You can stay aerobic, while standing, riders often must go anaerobic to maintain their effort, you can sustain aerobic effort much longer.

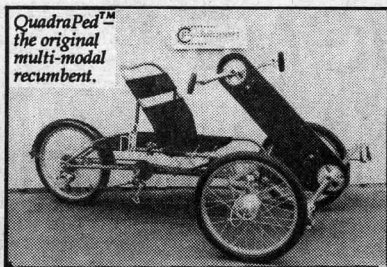
3) You will have much less aerodynamic drag going up the hill than a standing rider, especially into any sort of head-wind. (Pro. riders stand as little as possible because of this).

4) Your heart won't have to work as hard to get blood to and from your leg muscles since you are in more of a horizontal position.

The extra bike-weight that the "average" recumbent pedals around will work against you. There is no getting around this, however, it will work to your advantage coming back down the hills, allowing you to go further and faster up the next hill before you have to start pedaling again. (Gardner Martin

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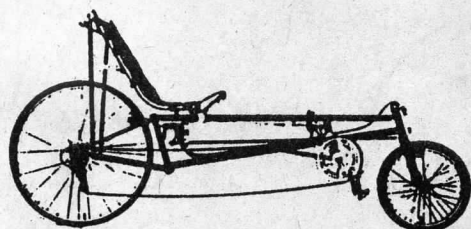
5460 SW Philomath Hwy. Corvallis, OR 97333 503.752.5035

did a "Coast-Down—Coast-Up test" that we will be printing soon.) With "equal" riders I have experienced this phenomenon, easily overtaking them on downhills and flats after falling slightly to moderately behind going uphill.

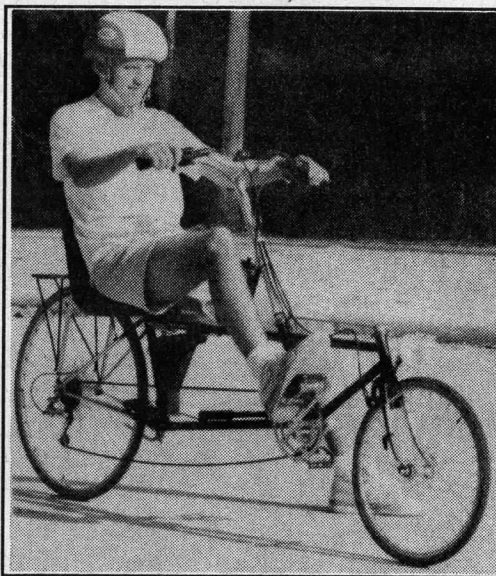
Be sure and set your bike up with low enough gears for the area in which you ride. You must have low enough gears so you can spin.

**TRAIN!** Your hill climbing ability on a recumbent is almost entirely a function of your conditioning, not the basic design of the bicycle.

By Wade Nelson



## DH Recumbents

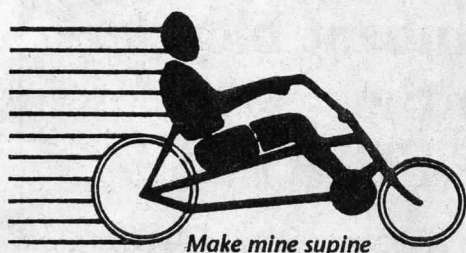


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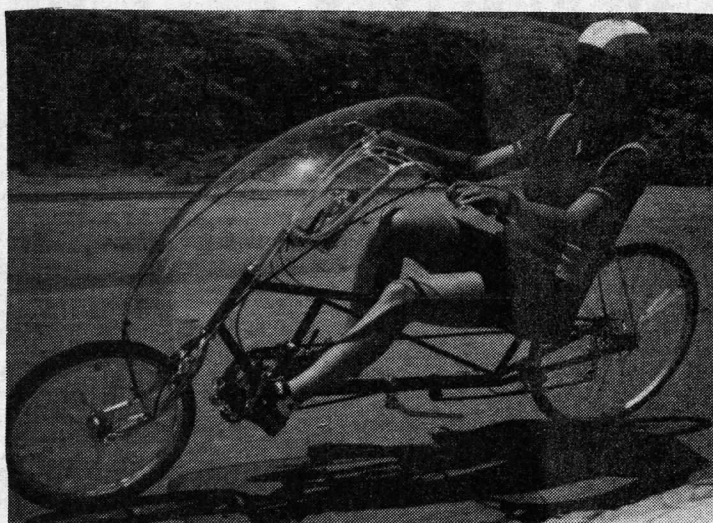
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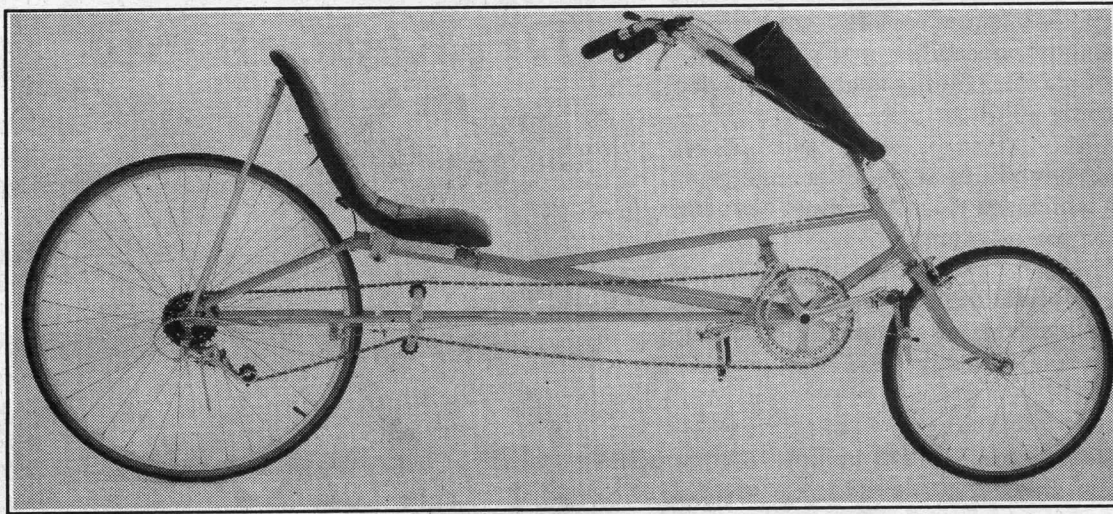
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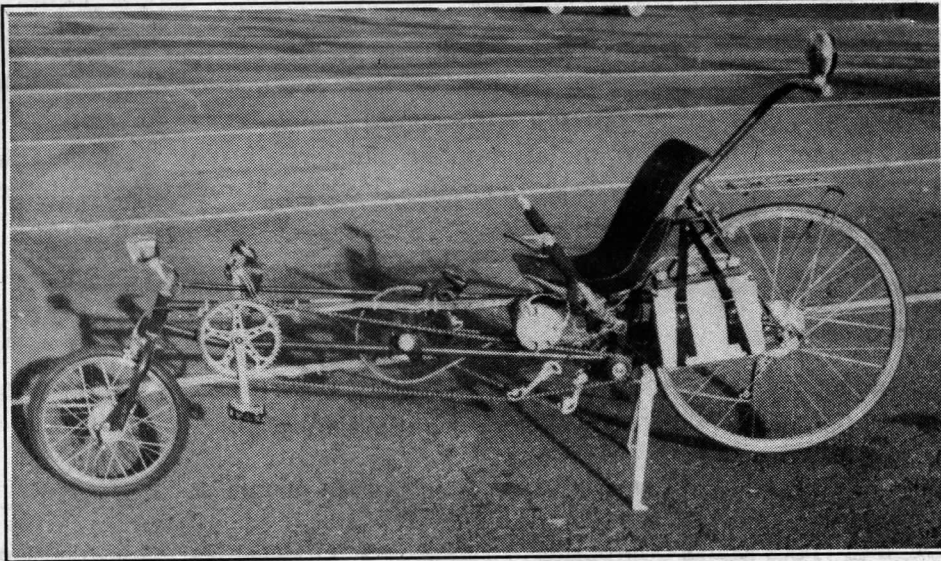
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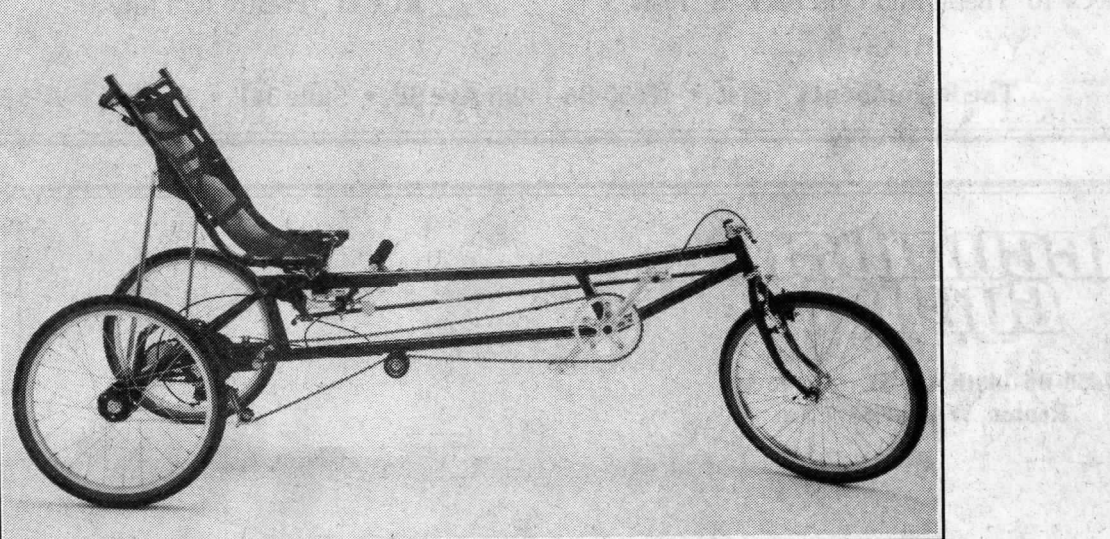
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## Photo Gallery



**The J. Benditt electric Prelude  
(Photo courtesy of J. Benditt Co.)**





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