

# THE RECUMBENT CYCLIST

August-October 1991

The Official Magazine of the  
Recumbent Bicycle Club of America

Vol. 2 No. 7 \$3.00



**Cover Story: The Lightning P-38 Recumbent**

## THE LIGHTNING P-38 RECUMBENT

by Robert J. Bryant

When the subject of high performance recumbents is presented, the Lightning P-38 is sure to come to mind. Considering all of the recumbents currently marketed in the USA only a few are really built for performance and only two designs really have the speed records to back up the claims. These qualities are not an after thought with the Lightning, but the purpose in which the bike is designed. It is apparent through our interviews with RBCA member/Lightning owners that they know what they want in a recumbent bicycle. Lightning owners seem to be among the most loyal owners of any brand of recumbent that we've tested.

### AEROSPACE BEGINNINGS

Tim Brummer and Company build the Lightnings in Lompoc California. Tim's background is Aerospace Engineering, the names of his bicycles reflect his interest in aircraft: the P-38, P-39, F-40 and X-2. Tim started experimenting with different designs as far back as 1980. A major part of his testing was to find a frame design/geometry that had better power generation qualities. The P-38 prototype was completed in 1983 and the first commercially built bike came out of the Lompoc shop in 1984. The Lightning design is continuing to evolve; many design changes and upgrades have been made over the last seven years.

### SPACE FRAME

The compact Lightning frame is a complex and intricate design. The reason for the "space" frame design is to produce a lightweight and extremely stiff frame that directs all energies to the rear wheel. The frame is made from different sizes of 4130 Chro-molly steel tubing and is hand brass-brazed in the Lompoc shop. Lightning has enjoyed a reputation for impeccable construction quality. The P-38 frames were built by Stephen Delaire of Rotator Cycles in Santa Rosa. This spring production was moved back to the Lompoc shop. Our test bike was the first one with the brazing done inhouse and the braze quality was not up to their previous standards. Tim was very honest about the problem and said that future frames would be improved.

The P-38 comes with a host of standard braze-ons: two

waterbottle mounts, a pump peg and dropout eyelets. The Lightning's paint is among the finest found on any recumbent. It is electrostatic baked on urethane powder and comes in red, or royal blue. This finish is extremely durable and looks great. We have found powdercoat much more durable than Imron, but not as glossy a finish. The difference becomes apparent when the bike is a year or so old and the Powdercoat still looks new. The new aluminum seat frame is anodized silver and much lighter than the previous chro-molly seat frame.

When Tim shipped the test bike he also included some of Lightning's new custom cast lugs. The lugs were part of the new seat design. The heat treated anodized aluminum seat bolts onto the lugs at the frame and to the seat stays at the seat cross support. This makes it much easier to ship

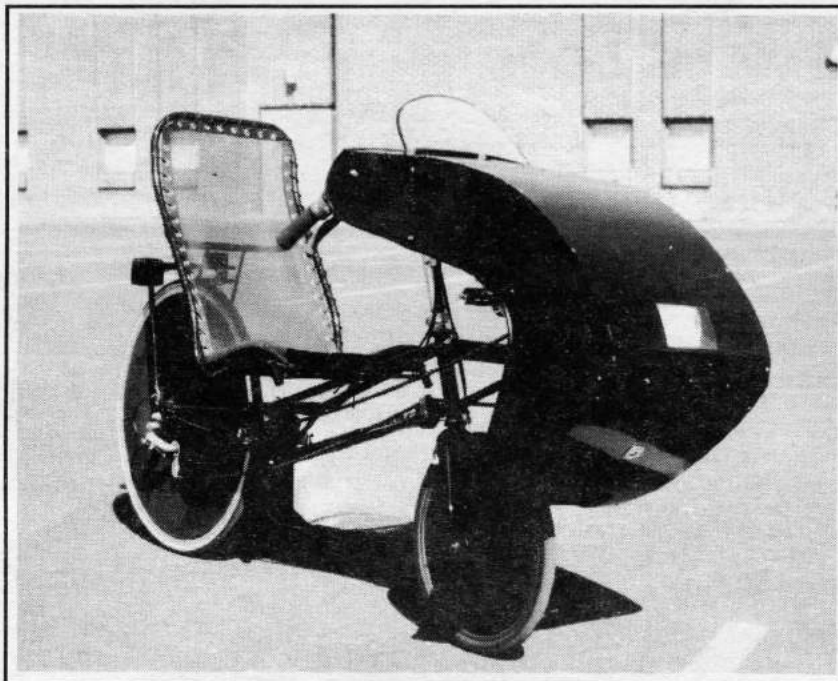
and transport. When the seat is off the bike you must be careful not to bend the stays which stand alone without the seat. The other custom lugs are for the fork-crown. Like the frame, the fork is intricate in design and impressive. It was nice to see a custom built fork on a SWB recumbent. Similar bikes depend on stock BMX steel or chro-molly forks which

are do not work as well. Lightning is also developing a front suspended fork for the top of the line F-40. This fork will be in the \$300 range and will retrofit to existing P-38's and F-40's. This should

make the bike ride much better with the stiff Moulton 17" wheel.

### LIGHTNING ORIGINALS

The Lightning has many original details. The seat is as good as recumbent seats get and is extremely comfortable with its high back and curved tubes that make up the lumbar support and finally the pad on the bottom portion.



**Jack Schaffeus' Custom Lightning P-38**  
Lexan fairing with PVC tube supports,  
weighs 6.5 lbs, giving a 10 mph speed increase!

Cover: The cover photo taken by RBCA member Lightning owner Dave Yust.

Yust Studio  
1301 Patton St  
Ft. Collins, CO 80524  
(303) 484-0675



The P-38 also has custom built bonded and welded aluminum stem extension and handlebars. The bike offers your choice of road pedals or Lightnings modified platform/heel sling pedals. The consensus is that the higher the bottom bracket the more you need something to hold you in the pedals, whether it be a clipless system (which we highly recommend for recumbents) or the heel slings. We had the chance to try out the slings last summer; they are wire hoops that are attached off of the back end of platform pedals. For me they worked fine; however one of my assistants almost immediately got caught in the wire hoop and fell over onto the ground. So caution should be in order. Also special for the Lightning are custom machined delrin precision bearing chain-idlers. They enable the bike to have the smoothest drivetrain of any of the short/ medium wheelbase designs available.

### COMPONENT SELECTION

The component selection on the P-38 is very good. The bike comes with an Sakae alloy triple crank with 28/46/50 chainrings. Also included is a 12-32 7 speed free-hub that makes for a wide range drivetrain of 24-112 gear inches. The headset (which is modified with a steering dampener) and the hubs are Shimano 105. The brakes are Dia Compe 500GX polished alloy side pulls with a quick release feature. These brakes come with Aztec pads and modified (curved downward) SunTour XCM mountain bike levers. The stopping power was excellent, especially with the Aztec pads, but if the you want to upgrade, Mathauser Hydraulic brakes are a \$240 option.

The P-38 comes with a SunTour rear derailleur, a Shimano Deore front derailleur, a SunTour bar-end shifters, and a Sachs-Sedisport chain. The 700c X 28 rear wheel features a Sun Rim and a 105 psi tire. The mix of SunTour, Shimano and Dia-Compe components is very well thought out. However, we did have some trouble with the indexing and rear derailleur. The derailleur listed on the spec-sheet was not the same as on our test bike. The specs call for a SunTour XCD rear derailleur but a newer model XCLTD was substituted. After 1-1/2 grueling hours, we were unsuccessful at getting the bike to index shift satisfactorily. We finally had to call in the pro-mechanics. They also had a tough time, but were able to improve the shifting.

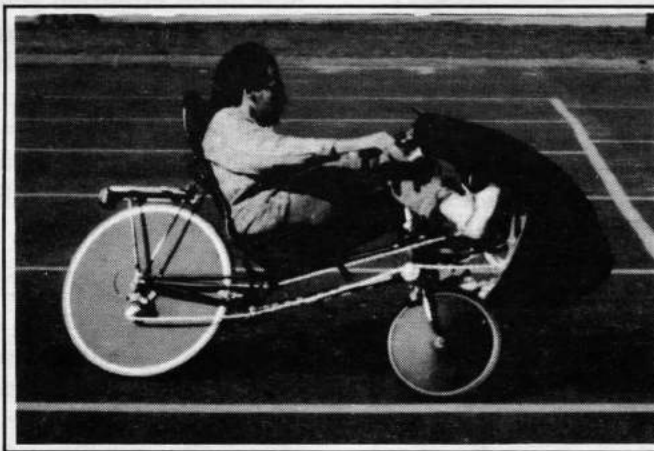
### THE "BUILD"

The Lightning has a first class owners manual. It is easy to read and mentions most everything you need to know about the Lightning including many helpful hints and cautions. There is even a section on adaptable accessories. The P-38 came in two surprisingly small shipping boxes.

Most of the assembly was straight forward and covered by the instructions, although it was a more involved "build" than some recumbents we've tested. If you purchase your bike from a bicycle shop there is no problem, but if you plan to do it yourself you should invest in a home bicycle maintenance and repair book to get you through. We were disappointed that the bike had not been preassembled or adjusted. By this we mean cables connected, derailleurs and brakes adjusted. The first impression a manufacturer-direct customer has with his new bike is during assembly. It can make or break the experience. We feel the more expensive the bike, the more preassembly should be done. We feel this is a vital service that manufacturers need to consider.

Even though the P-38's configuration is similar to that of a short wheelbase with the pedals ahead of the front wheel, the Lightning is actually a medium wheelbase recumbent. At 44" the design offers near perfect weight distribution-44/55. With this design comes inherent front wheel-heel interference. This is only a problem at very low speeds and the manual offers both warnings and instructions for a

successful first ride. Getting used to this can take some time. A P-38 veteran said it quickly becomes second nature, however, another P-38 owner told me that every once in a while he forgets and is quickly forced to learn all over again.



Jack's Customized P-38

Photo by Jack Schaffer, 512 Bourbon St,  
Haure de Grace, MD 21078 (301) 939-9168

### FRONT WHEELS

With many short/ medium wheelbase recumbents, there is a question over front wheel size. With many of these designs, a 20" wheel will not work. Regrettably, a smaller diameter substitute must be used. The P-38 comes stock

with a 16" X 1-3/8" wheel and tire. This is usually a 60psi touring tire made by Michellin. Many riders use and enjoy this recumbent tire, mainly because it is fairly inexpensive. Most recently, availability of both the rims and tires has become somewhat of a problem. Our test bike was delivered with a 50 psi tire called a "Golden Boy". This is not the kind of tire that we would expect to find on a performance bicycle. Tim Brummer has assured us that more Michellin tires and Sun 16" rims will be available for future bikes. For those dedicated to performance there is only one choice, Lightning offers a Moulton 17" 100 psi tire available with either a Campagnolo or a Shimano 600 hub. This tire offers a firmer less comfortable ride, but with a big performance increase. The Moulton is also difficult to find at your local shop and is very expensive.

### PERFORMANCE ACCESSORIES

There are several performance options available for the P-38. The stock P-38 Zipper Fairing is a \$150 option and

mounts to the handlebars. We were not able to test the Zzipper, but Lightning states that you can expect a 6% increase in speed. Also available are Lightning's custom fiberglass wheel covers. These are \$100 per wheel and offer a 3% performance increase. It is also possible to upgrade your P-38 to an F-40. The fiberglass nose cone, aluminum rear frame and Lycra Spandex center section are available as a package upgrade, although it is easier if you order it all at once. The F-40 is priced around \$3800 and comes with higher gearing, clipless pedals, hydraulic

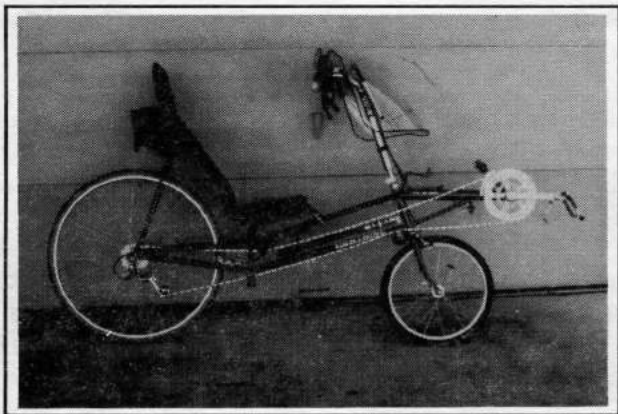


Photo by David Yust,  
Ft. Collins, CO

brakes and a freewheel with cogs of 11-32 making for the extreme high performance gear range of 24-133 gear inches! The F-40 is the most advanced streamlined street recumbent available. Brummer says that you can expect cruising speeds 40% faster than your normal bike, or 4-6 mph faster than your unfaired Lightning. We have not had the opportunity to test an F-40, although undoubtedly it's one of the fastest recumbents available today. With this in mind, we would jump at the chance to test ride an F-40.

### THE RIDE

There is no doubt that the P-38 is an original total performance bicycle. A veteran Lightning rider described the seating position as a high-performance-crouch. The bottom bracket/ crank is slightly higher than other similar recumbents and significantly higher than LWB recumbents. The steering is light feeling and ultra-quick; some have said responsive, others say overly sensitive. The Lightning's handling has been compared in the past to that of a criterium racer. With these attributes, the Lightning is a bike that takes some time to get used to. New riding and handling techniques must be learned. Along with the inherent heel interference, you need to watch the bar-end shifters so they will not touch your knees in low speed turns. The handlebar height adjustment is also crucial, especially if you plan to use the Zzipper Fairing. The P-38 required more effort and attention to the road than I was accustomed to. In some situations, usually longer rides, the riding position caused my feet to numb. A few Lightning riders said they had experienced this and others said they had not. Even though I had some difficulty getting used to the P-38, the design continues to

intrigue me. The Lightning also has some unique strong points. It offers better than average (for a recumbent) hill climbing abilities, however I again found myself paying more attention than usual. Most impressive is the acceleration of the P-38, which is immediately noticeable. These traits are due to the P-38's SWB geometry, light weight and very stiff frame.

### POWER OUTPUT

Lightning designers and many riders believe the P-38's riding position offers superior power output, for me it did not. In theory or scientific testing, it is certainly possible. My theory is not so scientific; the more comfortable you are, the more efficient you will be. For some this can be the P-38, for others something different. My advice to would-be high performance riders is to try both the long wheel base and short wheelbase bikes before you decide on one. I am often asked what the difference is between the two types of performance recumbents (SWB/ MWB vs. LWB). In the simplest of terms, you need to decide: 1) How quick handling and stable you want the bike to be; 2) in what body position you want to pedal (high bottom bracket vs. low), 3) how much attention you want to focus towards riding the bike, 4) the final consideration should be on whether or not and at what stage the bike is to be faired. This is more important than you may think. You can choose between small and large Zzipper Fairings, experimenter kits, custom fairings, Lycra bodies and finally the full F-40 style body. With all of this information you are all set to come to your own conclusions.

### PRACTICALITY

In some ways the P-38 is a much more practical vehicle than a long wheelbase, most apparent in transporting. The P-38 is only 72" long, compared with LWB recumbents that are significantly longer. For suburban riding the bike is very maneuverable in traffic. However, if you don't pay attention it can get away from you. Lifting your legs to the pedals at stop lights can be more difficult if you are not used to it. With the 16" front wheel in mind, I found myself

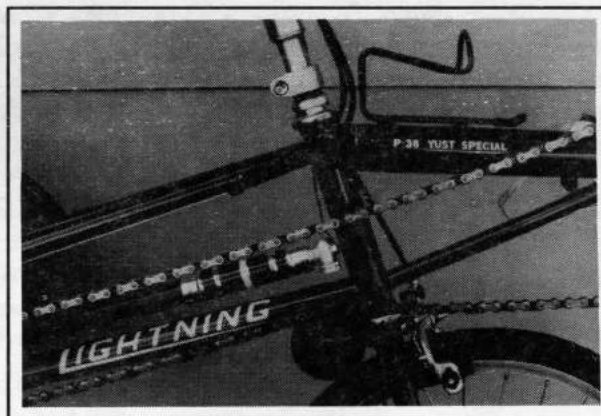
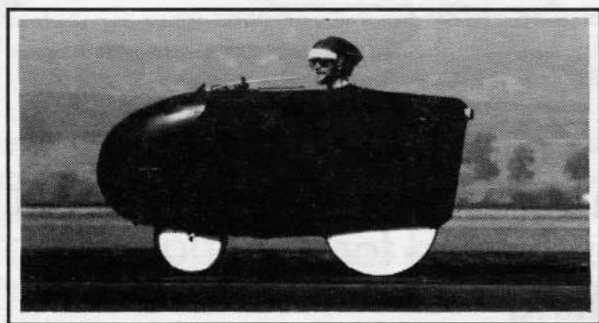


Photo by David Yust  
Ft. Collins, CO

paying more attention to chuck holes and bumps in the road. Load-carrying capacity is limited to 30 pounds; this is listed in the Lightning brochure. Towing my Burley



trailer was also more difficult because of the bike's sensitive handling. Lightnings have been successfully used for touring-one RBCA member rode his across the USA. His only complaint was an inordinate amount of flat front tires.



Tim Brummer on his Lightning F-40  
Photo by Bernie Mittelman

For me, the P-38 seemed more suited towards sport or high-performance riding than to practical daily transportation, although what is practical to one person may not be to another.

What impressed me most about the Lightning is the enthusiasm that the P-38 and F-40 riders have for this bike. Throughout the road test, I talked to and corresponded with many owners who love their bikes. The Lightning P-

38 is a fast, quick feeling and intense performance bicycle. The bikes are known for their excellent quality, reputation and race and speed achievement. Currently P-38's are \$1700. With the Zipper Fairing, Performance (Moulton) wheel option and a rear disc wheel cover the price is just over \$2100. Contact Tim Brummer and Company at: Lightning Cycle Dynamics, 1500 E. Chestnut Ct. #E, Lompoc CA. 93436, Ph.# (805)736-0700.

#### LIGHTNING X-2

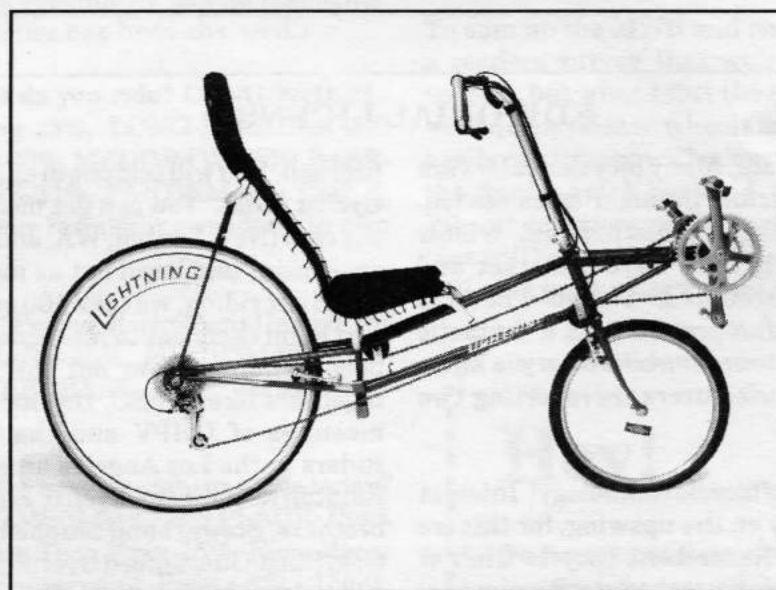
- \*JPMS Prize attempt: San Francisco to Los Angeles in 18 hours and 4 minutes. (X-2)
- \*STP Record(Seattle to Portland),192 miles in 7.5 hours, avg. speed 26 mph, (X-2)
- \*1/4 mile drag record, 41.47 mph.
- \*IHPVA Road Race Champion 1983 & 1984
- \*IHPSC 200 Meter Winner 1984

#### LIGHTNING F-40

- \*HPV RAAM WINNER: Race Across America, 2910 miles in 5 days, avg. speed 24 mph. (F-40)
- \*Argus Tour 3 time winner

#### WHITE LIGHTNING

- \*First HPV to break 50, 55 and 60 mph
- \*World record for 5 mile
- \*600/200 Meter record 50.58 mph.
- \*Abbott Prize Winner



San Francisco  
to  
Los Angeles:  
18 hours, 4 minutes

Los Angeles  
to  
New York:  
5 days, 1 hour,  
8 minutes

on a Production F-40 Model

# ***LIGHTNING***

Send \$2.00 for color brochure.

Lightning Cycle Dynamics  
1500 E Chestnut Ct  
Lompoc, CA 93436  
(805) 736-0700