

**RETAIL TECHNICAL MANUAL**  
**1996**



**GARY FISHER**

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# Gary and Greg

## The Evolution of Mountain Bikes

The year: 1974

Although having loads of fun descending the Marin foothills on his custom built downhill cruiser, Gary Fisher had the desire, and the legs, to pedal back up. He only needed the right equipment, he told his downhill buddies. His friends scoffed as they hopped into the old pickup for a lift back to the top for another run.

Meanwhile, Gary's mind was buzzing as he pedaled home. Diving through boxes of old bike parts, Gary's vision began to take shape. A few scavenged motorcycle parts, the artistic wave of a brazing torch, and Voila!

MountainBikes were born!

Since then, Gary's vision has continued to blossom. He combined his proven ingenuity with his feel for bicycles developed during his campaign as one of the best American road riders of his time. The result has been mountain bikes on the cutting edge of performance; Fat-tire wonders renowned for their performance and innovative solutions to the problems of off-road riding.

Gary's list of innovations accepted as standard spec reads like a definition of the ideal modern mountain bike- short wheelbase, steeper angles, short chainstays, larger diameter tubes, more tire clearance, oversize headset and steering components....the list goes on.

## The Mountain Bike of Tomorrow- Today!

And Gary's vision hasn't stopped. Still an active NORBA racer, Gary races and trains almost every day. And his creative genius is at work during every mile. When your customer buys a Procaliber Ltd., they're riding the same bike Gary himself rides.

Gary personally tests the parts and complete bikes in the Fisher line to see that they meet his demands. Gary also rides the competition to see how they check out, so that Fisher bikes will always be ahead of the pack.

Here are a few of the highlights of Gary's '96 line:

New small frame sizes

3 models of full suspension bikes

Refined frame fit details and adjusted head tube lengths for better handlebar position and overall fit

20 tooth chainrings making for lower gears on many bikes

Kids models

New tubing diameters and geometry on high-end steel bikes

New geometries on aluminum models; and butted tubesets on some

Upgraded Rock Shox suspension forks, as well as suspension forks from Manitou.

New Urban bikes, the Nirvana and Utopia. Not your standard hybrids!

## And the introduction of the all new Greg LeMond road bikes.

You can't call yourself a real cyclist if the TV didn't bring you goosebumps. Greg charging madly down the Champs d'Elysee, in full aero tuck. The clock ticking. And in the final time trial stage of the tour, Greg steals the overall victory from Fignon by mere seconds.

In addition to being a great bike racer, Greg has a long history in developing innovative products. The list of products Greg has been involved with is long, and the company names have since become well known. Many of those products are considered to be industry standards today: Cycling eyewear, EPS foam helmets, clipless pedals, aero bars...the list goes on and on.

Now Greg's focus is on bikes with his own name on them. Greg is a real stickler for the correct geometry, knowing as he does how important the bike is to a cyclist's success. It has to fit right. And have the right ride. Be made of the right materials, and with the right specs. He's striving to make sure every detail on his new bike line is absolutely perfect. Bikes ready for the Pro peloton. And sure winners.

We hope you will take the time to read through the information presented in this manual, and that the specifications and other resource material will be of help to you when selling Gary Fisher or Greg LeMond bikes in the upcoming year. If you have any suggestions regarding this manual, or any other ways we can be of service, please write to:

**Gary Fisher Customer Service**

**P.O. Box 183**

**Waterloo, WI 53594**

# Frame Materials

A bicycle must be strong and it must be stiff. It should ride great, and it should be as light as possible to avoid wasting the rider's energy. And let's not forget that it should be affordable.

It's easy to see that strength is required. And low weight. Correct stiffness means that pedaling energy is transmitted to the rear wheel better. It also means that the wheels stay in plane when side-hilling, making the bike easier to control in technical terrain. Stiffness also prevents the frame from twisting in hard corners or rough terrain, which would allow the bike to change lines unexpectedly.

But like anything else, you can overdo a good thing. If a bike is too stiff, it will ride harshly and the wheels won't follow the terrain like they should. If it's not stiff enough, it won't ride right either.

The right material in the right dimensions adds to the feel of the ride. By experimenting, we've achieved that feel while maintaining a light, efficient, durable, and affordable lineup for any serious rider.

The two most important considerations when selecting a material for bicycle construction are Specific Ultimate Strength and Specific Modulus. In layman's terms, Specific Ultimate Strength is the breaking strength of a material divided by its weight. Specific Modulus can be translated to mean the stiffness per weight.

The reasons for the importance of these factors are simple. If a material does not have a blend of stiffness and strength, it will either be heavy or be lacking in either strength or performance. Let's look at an example: Cro-Moly steel has a high specific modulus, but a fairly low specific ultimate strength, as shown in the chart. This means that a fairly high amount of material by weight will have to be used to make a Cro-Moly bike of good strength. However, Cro-Moly steel is usually relatively inexpensive and so can offer a good value, even if a Cro-Moly bike will be a little heavier than one of our aluminum or carbon fiber models.

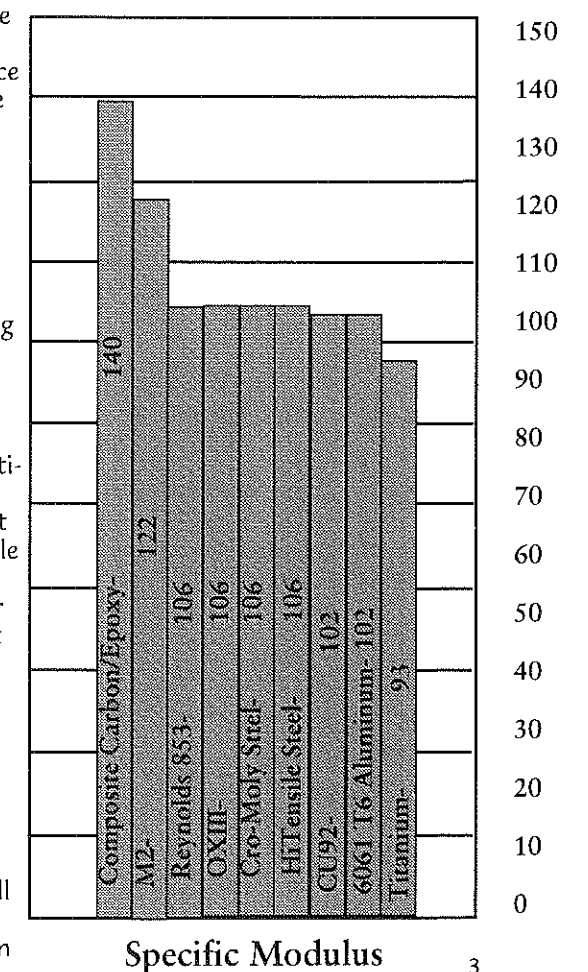
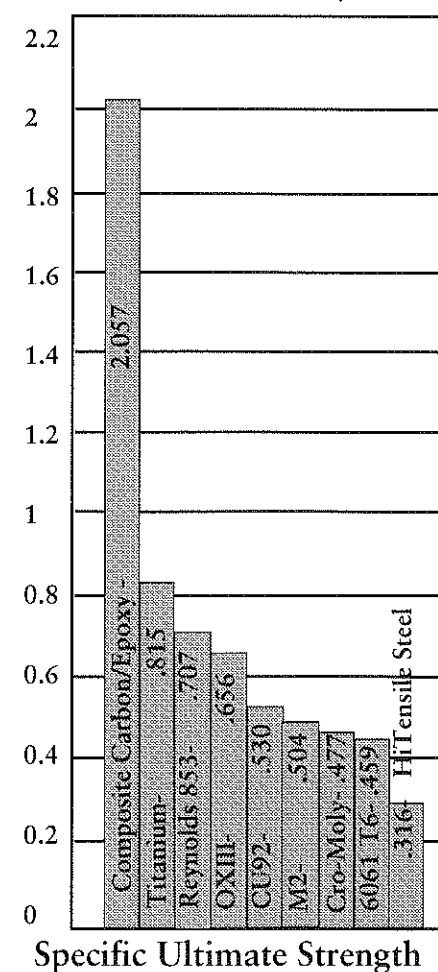
As another example, carbon fiber composite is quite a bit more expensive than Cro-Moly steel. However, because it has very high specific ultimate strength, a very light bike can be built that is very strong. In addition, carbon composite's high specific modulus means that even a very light carbon bike can still have the right stiffness for control and efficiency.

Another high tech material for bicycles is titanium. Although different alloys vary somewhat in their characteristics, generally titanium has a lower specific modulus than carbon fiber composite, Cro-Moly steel, and many aluminum alloys. Titanium has a higher specific ultimate strength than Cro-Moly steel, but is lower in strength than carbon composite. This means that a titanium bike of good strength and stiffness will be heavier than a carbon fiber composite bike of like performance, even though considerably more expensive.

As you look at these charts comparing characteristics of the various materials, remember that many factors will effect the end product. For example, increasing the diameter of a tube will increase its stiff-

ness, but reduce its resistance to dents. Manufacturing techniques will effect the price of a completed bicycle, where efficiency and accuracy can eliminate wasted time. A particularly interesting example is that from the strength listed on the chart, Reynolds 853 actually gets stronger when you weld it. And volume of manufacturing can bring prices down, an important fact that allows Gary Fisher and LeMond bicycles to provide expensive OCLV carbon bikes at competitive prices.

Another important point is that there's more to a bicycle than the tube set. Tubing which is no longer straight, or bikes that don't track straight due to poor alignment, are poor values. Both Gary Fisher and LeMond bicycles are built with high tech processes to ensure that the properties of the tubing remain after construction. Combined with Greg and Gary's designs, this means that your customer will get the most performance possible at every price point in the line.





# Suspension Technology

For the '96 Gary Fisher bicycle line, you'll find a lot of suspension. To help you understand and sell the differences between the various shocks used on our bikes, we offer the following explanations:

## SR DuoTrack 7006 fork

The DuoTrack uses a coil steel spring for 35 mm of travel. New this year are elastomer bumpers for both top-out and bottom-out, so if the rider does manage to max the fork out, its much quieter.

## Rock Shox Quadra 5 fork

The Quadra 5 has 48 mm of travel and uses a one-piece urethane elastomer. The preload is adjustable by hand with external adjusters at the top of each stanchion.

## Rock Shox Quadra 21 R fork

The 21R uses the body of a Quadra and the MCU elastomers from the Judy technology to offer 60 mm of plush travel.

## Rock Shox Judy XC fork

The Judy XC uses an MCU, or Micro Cellular Urethane elastomer stack with hand operated preload adjuster at the top of each fork leg. Because the elastomer stack is comprised of several separate pieces of different durometers, its also possible to change-out the pieces to further modify the stiffness if desired. Judys use oversized fork legs and a recessed brake arch to resist twisting during braking. Fork leg overlap and bushing separation are more than double that of the Quadras. This gives the Judys incredible lateral rigidity and steering control. The left leg uses a hydraulic damping cartridge which has its oil permanently sealed. Rock Shox uses damping to control the compression phase of the fork's motion because this is when the greatest forces are at work.

New for '96, the XC's damping range is adjustable like the '95 Judy SL and the new XC's stock travel has been boosted to 63.5 mm from last year's 50 mm. On the Joshua Y, Gary has specified the long travel XC-L with 75 mm of travel to compliment the 4" of rear end travel of the Joshua.

## Rock Shox Judy SL fork

This fork shares the features of the XC including travel. However, the SL is considerably lighter. Weight savings come from the use of titanium hardware and an aluminum alloy steerer. The crown and stanchions of the Judys are pressed together, saving weight by the exclusion of crown pinch bolts. On the Joshua Z, we are using a special version of this fork, with 75 mm of travel and carbon fiber brake arch.

## Manitou Mach 5 Pro fork

The new Mach 5 fork series offers several advantages. First, the new Posi-Link brake arch uses a bonded construction with a very large cross-section construction. This adds greatly to the rigidity and steering control of the fork, while reducing weight and maintenance because there are no bolts to tighten. The Pro is a step up from the Mach 5 Comp with lighter tapered fork legs, fork boots, and 7 mm more travel for a total of 58 mm. The Pro also uses 2 stage MCU elastomers. See the Gary Fisher Owner's Manual for adjustment information.

## Manitou Mach 5 SX fork

The Mach 5 SX offers 63 mm of travel with 3 stage MCU elastomers and adjustable rebound damping. Since compression damping makes a fork stiffer, Manitou chose to control the fork's speed during the rebound phase to maintain a softer compression stroke for the plushiest ride possible. The SX is lighter than Manitou's EFC downhill fork, with a lower ride height for better handling and slightly less travel.

## Stratos Air/Oil rear shock

The Joshua Z uses this cool air/oil unit. With a handlebar mounted control, the rider can adjust the damping on the fly from super plush to almost completely locked out. A little experimentation will show that you can ride a different air pressure when you have this much damping control. So in a way, the whole shock is more adjustable.

## Rock Shox Deluxe coil/over rear shock

The Joshua X uses a steel coil spring over an hydraulic damping cartridge. Since a coil spring has no stiction and the oil cartridge has very little, this shock works better than an air/oil unit in soaking up small frequency bumps. It is also easy to adjust and maintain, since there is no air pressure to keep up.

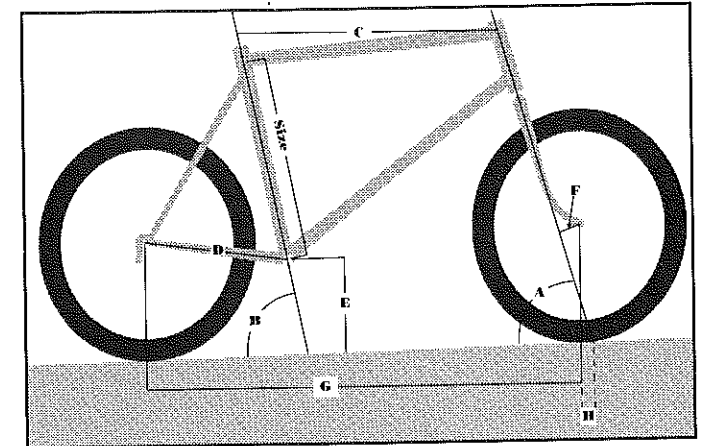
## Rock Shox Super Deluxe coil/over rear shock

The Joshua Y uses a similar set up to the Joshua X, except that rebound damping is adjustable. This allows tuning of the shock action, a particularly nice feature for the higher rebound forces which occur in harder and faster riding. Rock Shox also makes a version of the Super Deluxe with a titanium coil spring.

## Girvin Flexstem

Two of Gary's hybrids use the Girvin Flexstem for added comfort. The Alfresco uses an aluminum Flexstem, while the Zebrano uses a steel version. Both stems cushion the rider's hands from road insults by compressing an elastomer as the stem hinges. The elastomer can be changed to vary the stiffness. Travel is dependent on stem length.

# Geometry Terminology



- Standover height - The distance from the center of the top tube, measured at the middle of its length, to the ground. This is popularly used for sizing, but with today's geometry its only one component of a good fit.
- A: Head Angle - The angle formed by the intersection of the centerline of the head tube and a horizontal plane. This angle effects steering quickness, and the steeper the head angle, usually the quicker the steering.
- B: Seat Angle - The angle formed by the intersection of the centerline of the seat tube and a horizontal plane. This angle effects the fit of the bike, particularly addressing the length of upper leg bone, or femur, by changing the rider's position over the crankset. Usually, smaller bikes will have steeper seat tubes, while larger bikes will have more relaxed seat angles.
- Size- The distance from the center of the bottom bracket to the center of the top tube measured along the seat tube. Both Gary and Greg measure this way because that's how its shown on the engineering drawings, and because it more accurately tells the size of the frame. By using the center to center method, standover height may change with tube diameter, but the actual fit is accurately described. Alternate methods may measure to the top of the seat tube or top of the top tube, including the variable of tube diameter or extended seat tubes. Seat tube length relates to overall leg length, but with the advent of super-long seatposts and new frame designs, seat tube size is less meaningful than it once was.
- Top Tube Length- The distance from the junction of the centerlines of the head tube and top tube to the junction of the centerlines of the seat tube and the top tube. This measurement relates to torso length and positioning on the bike.
- C: Effective Top Tube Length- The length of a horizontal line from the junction of the centerlines of the head tube and top tube to the imaginary centerline of the seat tube. This measurement is important due to the sloping top tube with extra long seat post extension currently favored by mountain bikers. A more accurate version of the top tube measurement, this relates to torso length and positioning.
- D: Chainstay Length- The distance from the center of the bottom bracket to the center of the rear axle. This dimension effects weight distribution over the rear wheel.
- E: Bottom Bracket Height- The distance from the center of the bottom bracket to the ground. This measurement effects ground to pedal clearance, as well as stability of the bike by dictating the height of the rider's center of gravity.
- F: Offset or Rake- The perpendicular distance from the centerline of the head tube to the center of the front hub. Rake combined with head tube angle and wheel diameter yields trail
- G: Wheelbase- The distance from the center of the rear hub to the center of the front hub. This determines handling characteristics like turning radius, tracking stability, and shock absorption.
- H: Trail- The distance between where the head tube centerline intersects the ground and a vertical line dropped from the center of the front hub. This measurement effects the stability of the steering system and the feel of the steering. Longer trail usually means a "heavier" or more stable feel, while less trail usually feels "quicker" or "lighter".
- Front Center- The distance from the center of the bottom bracket to the center of the front hub. This distance effects both weight distribution and toe clip /front wheel overlap. Given that most mountain bikes use only a narrow range of steering angles and offsets, front center also refers to the amount of "cockpit room" the rider will have.
- Stem- This should be considered part of the bike's geometry because it effects weight distribution and steering feel. Along with handlebar width, it also relates to arm and torso length.
- It All Works Together- Every facet of bike design will effect another, so we can only talk in generalities about what any one dimension does to the bike. Its obviously true that each part of the bike is connected to another part of the bike. However, it isn't always apparent how changing one dimension on a bike will effect the others.

# 1996 Shimano Groups

## XT

- **RapidFire SL shifting-** Even less shift lever pressure is required with the new SL shifters. In addition, each shift requires a shorter throw of the lever. As expected, for the best performance, Shimano recommends that you do not mix previous components with newer items.
- **New cables and housing-** In '95, Shimano used a 1.1 mm cable with 3.6 mm housing. This allowed the housing to be more flexible, and reduced cable friction for smoother shifting. But the smaller diameter allowed some compression in some circumstances, so the sizes have been beefed up for '96. The new dimensions are 1.2 mm cables, with 4.0 mm housings.
- **Mechanics should note that the new Shimano housing comes pre-greased.** To prevent the grease from being pushed out of the housing, the cable should always be inserted into the end of the housing with the Shimano logo first, so the logo is closest to the respective lever. With some models we may use housing from another supplier. In this case, look for the housing end cap with extra rings which notes the end with grease inserted.
- **Top Swing front derailleur-** This new design was incorporated in some of Shimano's lower-line derailleurs in '95. By moving the derailleur cage in a straight line rather than an arc, Top Swing provides a linear spring rate to the front derailleur. This means more powerful shifting onto the large chainring with lighter action and increased durability. The linear spring rate also means a softer return for smoother downshifts.
- **Since the clamp band of the Top Swing design is lower than on previous derailleurs, on some frames this may be incompatible such as Joshuas and OCLV hardtails.** For these bikes, Shimano has made a new conventional front derailleur with Advanced Light Action to interface with the new RapidFire SL shifters.
- **Rear derailleur-** The new 'high efficiency' rear derailleur gets a stiffer upper 'P'-spring which adds chain tension, and along with the IG chainrings and chain works to virtually eliminate chainsuck. 'Advanced Light Action' is designed to work with the shorter throw and softer push of the new RapidFire SL shifters.
- **V-Brakes-** The long arms of the V-Brakes give extra leverage for incredible stopping power. V-Brakes open easily and very wide for easy tire removal. The V-Brake's unique linkage system keeps the pad parallel to the rim, rather than following an arc like a traditional cantilever. This means more powerful stopping, better modulation, less pad wear, and no "dive" from wear. This also means less chance for the pads to "drift" if not properly maintained and readjusted as they wear, which can cause tire sidewall cuts. Because of the large amount of cable pull required for the V-Brake, they require a specific Shimano V-Brake lever which utilizes an adjustable variable pull mechanism. As a bonus, the V-Brake has a side-actuating system with a very narrow profile, making it ideal for full suspension bikes with low cantilever boss placement where cable routing or leg clearance might be a problem. Since the new V-Brake requires a cable housing stop for the rear brake at the seat cluster, these brakes may not be compatible with some framesets.
- **Bottom Bracket Cartridge-** The new XT bottom bracket features chainline stabilizers to prevent over insertion of the cranks, which could effect chainline.
- **IG System- chain and chainrings-** Specially shaped tooth profiles and shifting ramps enhance shifting speed and accuracy. Combined with the new IG chain with new 7.1 mm width, this also virtually eliminates chainsuck. Although you will get acceptable performance mixing most of the parts, its recommended for best performance that you do not mix them. In any case, avoid using a HG or UG chain on the new IG chainrings, as the chain may tend to come off easily, which is potentially dangerous. Older IG chains, the IG50 and IG30, use a 7.3 mm chain width. These chains will not work with HG cassettes. If you use a new 7.1 mm chain on an older HG cassette, the SIS adjustment will be slightly more sensitive, so pay extra attention to this. IG chains will not work with Altus C90 derailleurs.
- **Other-** Independent shift pods and brake levers allow you to mix and match components as you see fit.

## LX

The new LX group shares all of the new features listed for XT, with the exception of V-Brakes.

Please read about the important features of these under the XT heading. In addition, LX gets: "Easy Set" Cantilever brakes-The new LX cantis feature the "Easy Set" design. This is an automatic toe-in feature, designed to simplify assembly.

## STX, STX-RC

These groups get the new RapidFire SL shifting, Top Swing front derailleur, Easy-Set cantilevers, new 7.1 mm chain, and independent shift pods and brake levers. Please read about the important features of these under the XT heading.

Cranks- the cranks have been cosmetically changed.

Bottom bracket- the new BB-LP26 now inserts 'normally' from the right side of the bike, and is denoted by the new grey colored 'fixed cup'.

## Alivio

Shift/brake levers- new finish.

Top Swing front derailleur- new finish.

Rear derailleur- 'High Efficiency' design.

Brakes- 'Easy-Set'

Cranks- New cosmetics

Bottom bracket- the new BB-LP26 now inserts 'normally' from the right side of the bike, and is denoted by the new grey colored 'fixed cup'.

"Silent Clutch" rear hub- 'Silent Clutch' design uses roller clutch for super durable, quiet operation. By using a set of roller bearings for drive, rather than a pawl-and-tooth design, this hub gives a very smooth engagement which adds rear wheel traction and smooths shifts even more than the standard IG system.

## Accera-X

Bottom bracket- the new BB-LP26 now inserts 'normally' from the right side of the bike, and is denoted by the new grey colored 'fixed cup'.

## Altus C-90

Shift/brake levers- E-Z fire design .

Front Derailleur- new finish

Rear derailleur- Alloy B-body- the part which bolts to the frame.

Brakes- 'Easy Set'.

Bottom Bracket- BB-CT91 inserts 'normally' into right side of the frame.

Cranks- Cosmetic change to the arm.

# Shimano Offroad Groups

# Misc. Specs '96

Bottom Bracket	BB-UN72 272 Right	BB-UN52 316 Right	BB-UN52 316 Right	BB-UN52 316 Right	BB-LP26 341 Right	BB-LP26 341 Right	BB-CT91 Left	BB-CS11 387 Left	Model Name Weight, gms Installation side
Brake/Shift Levers	• 2 1 4 1 398	• 2 1 4 1 383	• 2 1 4 1 394	• 1 1 4 1 385	- 1 1 3 1 416	- 1 1 1 1 -	- 1 1 1 1 -	- 1 1 1 1 -	RapidFire SL Ft Upshifts/Stroke Ft Downshifts/stroke Rear Upshifts/Stroke R. Downshifts/stroke Weight, gms
Brakes	- • • • 383	- • • • 370	• • • • 366	• • • • 338	• • • • 368	- • • • -	- • • • -	- • • • -	Anti-Vibration Cartidge-type pad Bushing-type mount V-Brakes Weight, gms
Front Derailleur	22T • 133	20T • 132	20T • 135	20T • -	18T • 163	18T • -	14T • -	22T • 164	Total capacity Stainless fasteners Weight, gms
Rear Derailleur	Al, polished & clear coated Al Al Al, anodized Steel 32T/11T/38 250	Al, painted Al, painted Steel Chr. plated Chr. plated 32T/11T/38 285	Al, polished Al, polished Steel Chromica Paint steel 28T/11T/37 293	28T/11T/37 266	28T/11T/35 267	28T/11T/31 -	28T/11T/31 -	28T/14T/34 317	Pivot/pulley cage  Outer link Inner link Outer cage plate Inner cage plate Max/Min/Capacity Weight, gms
Chain	IG Nickle plated Nickle plated	IG Barrel Nickle	IG Barrel Nickle	IG Barrel Nickle	IG Brown Barrel	HG Black Black	HG or UG Black Black	UG Black Black	Chain type Inner link Outer link
Rear Hub/ Cassette	8-al spider • • • 475 Chrome compatible 256	8 • • • 452 Silver compatible 326	7 • • • 442 Chromica IG 254	7 • • • 449 Chromica IG 299	7 • • • 445 Silver IG 299	7 • • • Black -	7 • • • Brown -	6 FW - - - Black - 460/FW	# of gears Freehub w/QR Alloy QR lever Hub weight, gms Cassette color IG Cassette wt, gms
Crankset	compatible 22/32/42 A/A/S 58/94 694	compatible 22/32/42 A/A/S 58/94 681	• 22/32/42 A/S/S 58/94 769	• 22/32/42 S/S/S 58/94 800	• 24/34/42 S/S/S 67 843	- 24/34/42 S/S/S Riveted	- 24/32/38 S/S/S Riveted	- 28/38/48 S/S/S Riveted	IG Chainring teeth C-ring material Bolt hole circle Weight, gms
XT	LX	STX-RC	STX	Alivio	Acera-X	Altus C90	Tourney		

## Tioga tires

Tioga uses a variety of descriptor letters along with the names of their tires. These can be confusing, so here we'll try to straighten it out:

Psycho- 1.95 casing width with the tread width more like that of a 2.1. Recommended tire mounting has the front chevrons pointing forwards, and the rear chevrons pointing rearwards when on top of the wheel.

K- Slightly rounded tread blocks, with more spacing between the knobs. Lighter and faster. The Psycho K weighs 540 grams.

S- Steel bead. The Psycho KS weighs 580 grams.

T- New rear specific tread with larger knobs for wear, and more cross-block tread for in-line traction both climbing and braking.

R- Amber or blond colored, softer tread, and we thought it was R for Racing.

II- Denser tread pattern for durability.

Psycho Ltd.- Uses a Cyclex casing with Kevlar beads resulting in a very low weight of just 470 grams.

## GripShift

On the Shortcut, the simplicity and reliability of GripShift are much better than the more complicated mechanisms used in other shifting systems. Another benefit of GripShift on the Shortcut is that its shifted using bigger muscles of the forearm and wrist instead of finger and thumb, so its easier for small hands to operate.

Features for '96 include the new 900 ESP shifters and rear derailleur which weighs just 185 grams. See page 10 for specific information on this new system.

## Sugino cranks

Gary has spec'd Sugino cranks on many of his '96 models. On many models, these cranks offer a 20T inner chainring. While this gives a lower low, it also makes for improvement of the entire low range. We have also chosen Sugino cranks for their weight savings where appropriate.

Impel 300- 3 steel rings, 875 gms.

Impel 350- 42T ring anodized "Super Duralumin", 740 gms.

Impel 500- Middle and big ring anodized "Super Duralumin", 675 gms.

Impel 700- Similar to the 500, but with hard anodized alloy rings for extra duarbility. 675 gms.

## Bontrager rims

Bontrager Red Label- A premium lightweight off road rim, built to withstand the rigors of off road use, and at a mere 370 grams. Made from 6000 series aluminum alloy with a special cross section designed by Keith Bontrager with multiple cavities for lower weight and high strength. Recommended for front use only. Special rim sidewall preparation adds braking performance. Stainless eyelets.

Bontrager Blue Label- A heavier version of the Red Label, designed for rear wheel use. Still light at just 410 grams.

## Matrix rims

Matrix Lobo- Matrix rims are made in the U.S.A. The Lobo uses 6000 series alloy in a single wall, dual cavity sport/performance design. This rim offers world class, "seamless" braking performance thanks to the welded construction and machined sidewalls. 505 grams.

## Mavic rims

Mavic 221 "UB Control"- The 221 is a pinned construction rim which uses Mavic's UB Control technology. UB is a process for machining the rim's sidewalls. This provides a very accurate rim dimension for smooth, uninterrupted sidewalls and some texture which adds to the stopping performance. 440 gms.

Mavic 217 "UB+SUP"- Mavic's SUP technology with its welded construction and UB Control machined sidewalls for the best performance. Single cavity. Eyeletted. 410 grams.

# GripShift ESP 900

SRAM Corporation's GripShift shifting systems have been winning fans in the mountain bike world for several years now. The growth in GripShift's popularity stems from their ease of use, low weight, relative simplicity, and the expected durability that comes with that simplicity. All these features are the result of a lot of R&D by the people at GripShift, who listened to their customers and worked hard to deliver what riders asked for.

## Dedicated System

Following the theme of listening and delivering, GripShift has introduced a new American made rear derailleur and dedicated shifter called the ESP 900. By dedicated, we mean that this new derailleur will not work with existing Shimano shifters. Nor will this shifter work with other derailleurs.

## Reduced Actuation Ratio

The reason why this is a dedicated system is that it takes about 75% more cable movement for each shift than existing systems. So the shifter pulls more cable, and the derailleur requires more cable pull for each shift.

The reason for this greater amount of cable pull are two fold. First, if more cable moves in the same period of time, friction of the cable is reduced. Second, by moving more cable for the same amount of shift travel the movement of the derailleur can be more precisely controlled. The result is more positive shifting without any extra shifting force required. But that's just part of the story.

## Chain Gap Control

The ESP 900 derailleur uses a "coaxial" guide pulley. This means that the upper derailleur pulley is on the same pivot as the derailleur cage. Combined with a steeper parallelogram, this keeps the upper pulley at a more constant distance from the cogs resulting in more precise shifting over the whole cassette range. It also eliminates the need for a "B" pivot spring and thus removes a variable in the shifting system.

## Materials Science

GripShift has developed several new derailleur body materials, including a carbon fiber composite with very high strength to weight characteristics. A stiffer extension spring keeps shifting snappy. And along with the new materials, GripShift's 900 derailleur is fully rebuildable, so the rider can expect the derailleur to have a long lifetime with a little maintenance. All pivot pins are serviceable, cleanable, and replaceable.

## Other Performance Features

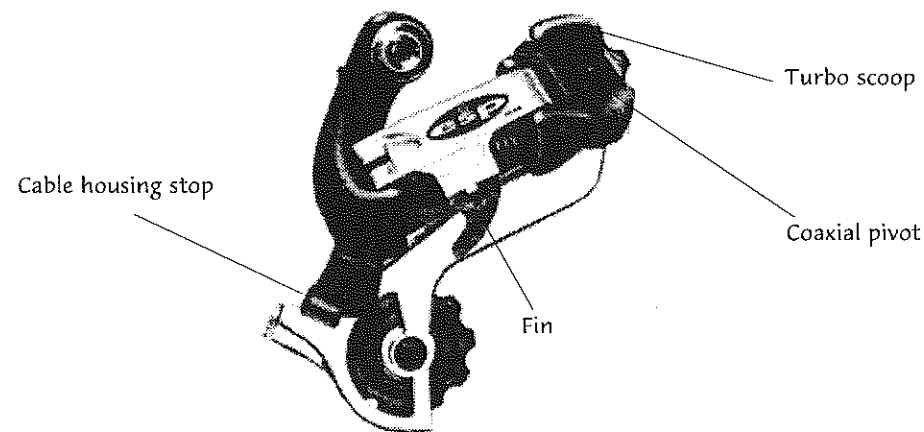
The derailleur body itself has several unique features. These all add to the ESP 900's shifting performance.

The "Turbo Scoop", located at the upper pulley, controls the chain as it moves off the upper pulley onto the cogs. This part is an ultra high molecular weight polyethylene, which eliminates wear of the derailleur body.

The "Fin" controls the derailleur actuation ratio, giving the shifter a powerful mechanical advantage for a very light shift effort.

A special housing stop design is angled to reduce friction and allow the cable to drain. By eliminating the redundant cable tension adjuster on other derailleurs this area is strengthened while reducing weight. After all, there's already one on the shifter!

The ESP derailleur places the upper pulley forward of the cassette. This allows the chain to be led onto the cassette smoothly without a floating pulley for crisper shifts. It also means the chain engages more cog teeth. More engagement is a plus in conditions where the chain may be clogged, like in mud or snow. With more teeth engaged at a given time, there is less wear on each tooth, helping to increase the life of the cogs.



# Gary's Eye for Detail



Gary has spent many years cycling, especially off-road. Ridden in lots of different conditions. Over the years, he's learned what works and what doesn't work. Not that Gary is the only one in the world who likes to ride, but Gary also likes to tinker. Lots of people have been in situations where they wondered why their bike didn't completely fulfill their needs. But when faced with such a situation, Gary had the talent and has taken the time to seek answers to the questions left unanswered by others. In fact, that's how he invented Mountain Bikes in the first place, and that's how the Gary Fisher frame design came about.

## Gary Fisher accomplishments:

- 1974- Built first mountain bike
- 1984- First production mountain bike with Dura-Ace freehub, toe clips and straps
- 1984- Helped Shimano develop index shifting
- 1988- Introduced Fisher CR-7 mating aluminum main triangle to Cro-Moly stays
- 1989- Developed Evolution frame design and components, starting trend to oversize from 1" standard
- 1991- Developed Mt. Tam, first production mountain bike with front suspension

## Gary Fisher designs:

• Ultrashort 16.5 inch chainstays. By tucking the rear wheel in under the rider more than other bikes, Gary's design puts more weight on the rear wheel. Most riders already know that this helps give suction cup climbing. But it also means better rear wheel braking. And allows the rider to move weight off the front wheel easier when lifting it over a ditch or log. The problem with such short stays is wheel and chainring clearance, which Gary solved with his Hipstay design.

• HipStays. By using a special bend in the chainstays, Gary has managed to leave enough room for the rear wheel, but also provide room for the chainrings and a proper chainline.

Steeper angles. One of the hardest parts of mountain bike design is getting the steering right. On the one hand, you want a bike that is rock solid at high speed in the roughest conditions. On the other, you want it nimble at low speeds, and no wheel flop on steep climbs.

These two needs are difficult to balance. By playing with the angles and offset of the bike, combined with the weight distribution, Gary has found the optimum balance.

How did he do it? Gary actually built a fully adjustable bike. Virtually all facets of performance could be tuned, from bottom bracket height to head angles. Then Gary applied his considerable saddle time and 'feel' to find the perfect combination. The result is a bike with steeper angles than most, with a slightly modified trail. Then he took what he had learned and adapted it to his entire line in a whole range of sizes, including small bikes with 24 inch wheels.

In addition to the steering Gary also focused on efficiency on the bike. By using a slightly steeper seat tube than others, the transition from sitting to standing is very smooth on a Fisher bike. This allows the rider to change position without breaking traction, a really important feature in changing terrain.

• Modified top tube lengths. So Gary mastered the mountain bike's technical handling. But at the same time, he wanted his bike to be comfortable. Gary is no stranger to the laid-out aerodynamic position of road bikes, having been one of the best road racers in the U.S. at one time. But off road, Gary wanted to see the sights, and sometimes still pedals for more hours in a day than most folks would consider normal. So he opted for a slightly more upright position than road bikes offer. Through his experimentation, he found top tube lengths which give lots of cockpit room so the rider can move around and balance the bike better in technical terrain.

It's important to note that when comparing top tube lengths, Gary's design will actually ride 'bigger' than others because of the steeper seat tube angles. With a steeper seat tube, the rider does not need to move forward as much when standing to get their weight over the bottom bracket when compared to other designs.

• Cables routed to make things work better. With many bikes, the cable routing is selected mostly to make the bike easier to build. Gary has gone to the extra expense of designing the cable routing with performance first in mind. With smooth lines to all the cables for low friction, slotted stops for easy maintenance, and top tube routing to keep the cables out of the gunk, every Gary Fisher mountain bike will get the most performance possible from the derailleurs and brakes. Gary's attention to detail may not be as noticeable on new bikes, but as the miles roll along and the water, gunk, etc. accumulate, it means that it's easy to keep a Fisher bike running like new.



- Bullet housing stops. Its attention to detail that sets Gary's bikes apart. Little things like using tapered and rounded 'bullet' cable stops to prevent snagging of your clothes. There's a lot more common-sense design hidden in the tubing specs, cable stop placement, etc. that all comes from Gary's experience as a rider and the inventor of Mountain Bikes.

- All Gary's bikes are this way. With many manufacturers, you only get their 'best' design when you buy their most expensive bikes. Gary believes that everyone, from first timer to veteran racer, will benefit from his innovations. That's why you'll find these features on Gary's least expensive full sized bike or even on the 24 inch wheeled Tyro and Maniac.

# Bike Specs: A Guide

These sections are designed to help the mechanic in the shop as well as the sales person on the floor. We've put just about everything there is to know about each model on a page. You'll also find info to help you size a bike, or better fit a customer by switching to a different model.

## Special Notes:

- Headset size- indicates the Stem/Inner head tube/ Fork crown race seat diameters in millimeters and also the stack height. This is the height of a headset when installed in the frame. This dimension is added to head tube length as well as steerer clamp height and spacers for Direct Connect or AheadSet systems to calculate steerer length. Its always better to measure steerer length, or calculate it, than rely solely on the chart's Steerer length.
- Handlebars- Includes width and stem clamp diameter.
- Stem and Stem extension- the length of the stem measured from the center of the handlebars to the centerline of the steerer and stem quill, along the centerline of the stem. Because some stems are horizontal and some stems angled, there are two other stem dimensions to be aware of: reach, the horizontal component of the stem, and rise, the vertical component of the stem. Example: A 100 mm stem with a 25° rise in a bike with a 71° head tube will have a 44° rise when measured from the ground. In the bike this 100 mm stem has a reach of 71 mm and a rise of 71 mm. Also listed is the steerer clamp height of Direct Connect stems, because this effects steerer length. The degrees of rise on each stem size specified.
- Seatpost length- In some cases, long posts will not allow the seatpost to slide entirely down into the frame. If substituting seatposts, please ensure that the new seatpost is measured accurately for diameter.
- Crankset- Lists the chainring bolt hole circle, a dimension which must be matched when replacing chainrings. The number of chainring teeth are listed in the gear chart.
- Bottom Bracket- indicates model, shell width, and axle length of the bottom bracket.
- Front derailleur- indicates the seat tube diameter, or "braze-on type" if the derailleur doesn't use a band or clamp attachment. Also calls out down pull or top pull, as well as Top Swing models which clamp to a different location on the seat tube.
- Hubset type- describes the hub configuration for cassettes, single cogs, or freewheels, and number of gears. Also listed is the O.L.D., or Outer Locknut Dimension, which indicates the width of the hub's axle between the inside dropout faces. The number of teeth on each cog is listed in the gear chart.
- Tire size- Indicates the specified tire's listed size. In most cases, other tire sizes will also fit.
- Spokes- Indicates the number of spokes, length and gauge required.
- Angles and such- They're all listed, size by size. For explanations of the terms, and what they mean to the rider, see page 5.
- Stand over height- the distance from the ground to the top of the top tube, measured in the middle of the top tube.
- Reach- the horizontal distance combining the reach of the stem with the effective top tube. This is a different way of measuring reach than we have used in the past, but a more accurate one.
- Head tube length- original length of head tube. Use this to calculate the steerer length is you need it. Add stack height, head tube length, and stem requirements. Please note that different direct connect stems and spacers require different steerer lengths. This dimension can also be helpful in determining how high the handlebars might be on a given bike model and size.
- Steerer length- Brought back by popular demand, but a caution: If the headset, spacers, or stem spec has been changed since we originally did our calculations, this may be off. A good mechanic will always take the time to check all the components and do their own math. Measure twice, cut once!



Minnosaurus

Our Price: \$

General Specs

Frameset	Frame	HiTensile steel		
	Fork	HiTensile steel		
	Headset	Steel	22.2/ 30.0/ 27.0, 33.0 mm stack height	
Controls	Handlebars	Steel	Downhill bend	
	Stem	Steel	TIG welded	
	Shifters	-		
	Brake levers	-		
	Grips	Kraton		
Saddle		Fisher	"Supersoft" foam	
	Seatpost	Steel	Chrome plated	
	Seat binder	Kalloy	M6 x 55	
Brakes		Coaster		
Drivetrain	Crankset	One piece	40T	
	BB	VP-B35	24 TPI	
	Pedals	ATB nylon		
	F. derailleur	-		
	R. derailleur	-		
	Rear Cog	18T		
Wheelset	Chain	KMC 410	1/2 x 1/8"	40
	Hubs	Steel	Sealed, nutted, silver	
	Rims	Steel		18 45
	Tires	Dinosaur tread	20 x 1.75	
	Tubes	Schraeder		
	Spokes	Chrome plated	32 front and rear	
		Front	187 14ga.	
		Rear- D/ND	185 14ga.	
Weight		25.5 lbs.	11.6 kg	
Color		Boy's- Gloss Royal blue		
		Girl's- Gloss Pink		

Geometry and Fit Specifics

Sizes			13
Standover height			702
			27.6
Effective top tube			545
			21.5
Reach			614
			24.2
Head tube length			90
Handlebars	25.4 mm	Width	540
Stem	22.2	Length	90
		Degrees rise	20
		Insertion	140
Seatpost	26.6 mm	Length	300
Cranks		Length	5 1/2"
Fork		Steerer length	128- 138/girls
		Offset	40
		Trail	83
Head angle			70.0
Seat angle			74.0
Wheelbase			1027
			40.4
Chainstay length			430
			16.9
Bottom bracket height			281
			11.1

Minnosaurus Notes

Gary spec'd this little bike for the new Fisher rider. The Minnosaurus uses a special short-bladed fork so that the head tube can be as low as possible. This adds standover clearance without shortening the seat tube. The result is a bike which will fit longer as a child grows, so its a better value for parents. It uses steel cranks and bolt on wheels because little folks don't take as much time to do their maintenance as older riders. But even a little Fisher has to be cool, so it has 'downhill' handlebars and Dinosaur treads!

Shortcut

Our Price: \$

General Specs

Frameset	Frame	HiTensile steel		
	Fork	HiTensile steel		
	Headset	Steel	22.2/ 30.0/ 27.0, 33.0 mm stack height	
Controls	Handlebars	Steel	"Downhill" bend	
	Stem	Steel	TIG welded	
	Shifters	GripShift QuickShift 60		
	Brake levers	Alloy		
	Grips	Kraton		
Saddle		Fisher	"SuperSoft" foam	
	Seatpost	Steel	Chrome plated	
	Seat binder	Kalloy	M6 x 55	
Brakes		Alloy	Cantilevers	
Drivetrain	Crankset	One piece	40T	
	BB	VP-B35	24 TPI	
	Pedals	ATB nylon		
	F. derailleur	-		
	R. derailleur	Shimano Tourney		
	Freewheel	Shimano HG22	14-28 6 speed threaded	
Wheelset	Chain	KMC UG50		
	Hubs	Steel	Nutted, sealed, silver	40
	Rims	Weinmann 519		14 57
	Tires	ATB knobby	20 x 2.0	16 50
	Tubes	Schraeder		
	Spokes	Chrome plated	36 front and rear	18 45
		Front	188 14ga.	21 38
		Rear- D/ND	185/187 14ga.	
Weight		25.5 lbs.	11.6 kg	24 33
Color		Boy's- Red		28 29
		Girl's- Dry lavender		

Geometry and Fit Specifics

Sizes			11.5
Standover height			702
			27.6
Effective top tube			545
			21.5
Reach			614
			24.2
Head tube length			90
Handlebars	25.4 mm	Width	540
Stem	22.2	Length	90
		Degrees rise	20
		Insertion	140
Seatpost	26.6 mm	Length	300
Cranks		Length	5 1/2"
Fork		Steerer length	132 -142/girls
		Offset	40
		Trail	83
Head angle			70.0
Seat angle			74.0
Wheelbase			1027
			40.4
Chainstay length			430
			16.9
Bottom bracket height			281
			11.1

Shortcut Notes

This is basically a geared version of the Minnosaurus. By adding a 6 speed freewheel and QuickShift shifter, the shortcut can tackle more terrain and go further. Along with this, the Shortcut also gets front and rear cantilever brakes, and knobby tires.

Upgrades from the Minnosaurus

Weinmann alloy rims  
Knobby tires  
6 speed w/QuickShift  
Front and rear cantilever brakes

# 24" Wheel Bikes

For 1996, Gary Fisher's 26 inch-wheeled mountain bikes come in frame sizes as small as 11.5 inches. Still there are riders who need smaller bikes to get the kind of performance Gary intended mountain bikes to offer. Gary's 24 inch wheeled mountain bikes, the Tyro and Maniac, are designed with these riders in mind.

The question is always asked: "Why can't you make my size of bike with 'big' size wheels?" The answer revolves around weight distribution, handling characteristics, and more. But the simplest way to explain the problem is good fit. If the rider needs a short seat tube, they probably also need a short top tube.

The easiest way to get a shorter top tube than that offered on the 11.5 inch Aquila would be to move the front wheel back towards the bottom bracket and decrease the front-center. This would create a problem because the front wheel could then contact the toe clips or the rider's foot when turning at slow speeds.

To avoid toeclip overlap, the alternative method for shortening the top tube would be to use a more laid-back head angle while maintaining the existing front-center. Such a design would have very poor steering characteristics, so is unacceptable.

Another example of the wrong approach to fitting smaller riders: Some companies use a really steep seat tube which allows them to list a shorter top tube. But the rider's position over the pedals is important to cycling efficiency and is relative to the bottom bracket, so moving the seat tube forward doesn't place the rider closer to the handlebars to make the bike fit better, but only serves to fool the uninformed buyer.

The real solution is to use a smaller front wheel so that you can decrease the front center without having toeclip overlap. A smaller front wheel also allows a lower head tube so the handlebars can be moved down to a correct position for good handling.

As long as you're going to use a smaller front wheel, you should also use that size in the rear so that the rider doesn't have to carry two sizes of tubes in their bike's seat bag. This also allows the whole bike to be redesigned to be fully proportionate for the smaller rider with shorter chainstays and wheelbase. By making this change, Gary's small bikes will have the same feel under a small rider that Gary's bigger bikes offer to the bigger rider. The gearing has even been modified to provide appropriate gear ratios.

Gary feels very strongly that every Gary Fisher bike should handle and ride the way Gary himself would want it. The beginning mountain biker should have the equipment with the same capabilities as the professional racer because it makes off-road riding easier for both of them. Granted, the Procaliber Ltd. is lighter, but the Tyro can be ridden in the same terrain.

So who will fit these smaller bikes? Since the standover of a Tyro is 25.2 inches, we'd expect that someone from the low-to-mid four foot range up to someone around 5 feet would best be served by a Tyro or Maniac. Since the wheelbase is about an inch shorter than Gary's 'big' bikes, the smaller rider will get a quicker handling bike more appropriate for their smaller size. With the shorter chainstays, they will have more weight over the rear wheel for improved traction in climbing and braking. And by being more 'on top' of the bike, they will be able to better handle the bike in technical terrain. With the right size bike, they can experience the same thrill as Gary does on his own Fisher.

# Tyro

Our Price: \$ \_\_\_\_\_

## General Specs

Frameset	Frame	HiTensile steel			
	Fork	HiTensile steel			
	Headset	Steel	22.2/30.0/27.0, 33.0 mm stack height		
Controls	Handlebars	Steel			
	Stem	Steel	TIG welded		
	Shifters	GripShift QuickShift 60			
	Brake levers	Alloy			
	Grips	Kraton			
Saddle	Seatpost	Fisher	"SuperSoft" foam		
	Seat binder	Steel	Chrome plated		
			M6 x 23.5		
Brakes		Alloy	Cantilever		
Drivetrain	Crankset	SR	Riveted rings		
	BB	YST BB613			
	Pedals	ATB nylon			
	F. derailleur	Shimano Tourney	Down pull, 28.6 mm / 1 1/8"		
	R. derailleur	Shimano Tourney			
	Freewheel	Shimano HG22	6 speed, threaded		
	Chain	KMC UG50			
Wheelset	Hubs	Alloy	Nutted f & r, threaded, 135 mm O.L.D.		
	Rims	Weinmann 519			
	Tires	Kenda	Blackwall, 24 x 2.0		
	Tubes	Schraeder			
	Spokes	Chrome plated	36 front and rear		
		Front	239 15ga.		
		Rear- D/ND	236/238 15ga.		
Weight		27.4 lbs.	12.4 kg		
Color		Boy's- Gloss Bright Blue			
		Girl's- Dry Magenta			

	28	38	48
	14	--	64
	16	41	56
	18	37	50
	21	31	43
	24	28	37
	28	24	32

## Geometry and Fit

Size	11.5
Standover height	640
	25.2
Effective top tube	525
	20.7
Reach	601
	23.7
Head tube length	85
Handlebars	25.4 mm
Stem	22.2 mm
	Width
	Length
	Degrees rise
	Insertion
Seatpost	26.6 mm
Cranks	Length
Fork	Length
	Steerer length
	Offset
Trail	68
Head angle	70.5
Seat angle	74.5
Wheelbase	981
	38.6
Chainstay length	394
	15.5
Bottom bracket height	277
	10.9

## Tyro Notes

The Tyro is for small folks who want a real mountain bike, not just a cut-down big bike. Smaller wheels allow a shorter top tube for better fit and correct weight distribution over the wheels. This give the Tyro great handling and excellent traction. And the gearing is specially set up for the smaller wheels.

The Tyro's compact fork design allows a lower top tube, which means more standover height. The extra standover means more 'growing room' so a bike will fit over a longer period of time.

Along with a well thought out frame design, the Tyro has special spec to make mountain bike riding easier and more fun for smaller folks. Narrow bars, shorter cranks, adjustable reach brake levers, and GripShift QuickShift 60 shifters all add up to a better fitting mountain bike that will help small riders learn to love the dirt. And another parent pleaser is the nutted hubs, which take the worry out of wheel attachment.

# Maniac

## General Specs

Frameset	Frame	HiTensile steel	Elastomer/coil spring suspension, 38 mm travel
	Fork	SR DuoTrack 7006	22.2/30.0/27.0, 33.0 mm stack height
Controls	Headset	Steel	
	Handlebars	Steel	
	Stem	Steel	TIG welded
	Shifters	GripShift QuickShift 60	
	Brake levers	Alloy	
	Grips	Kraton	
Saddle		Fisher	"SuperSoft" foam
	Seatpost	Steel	Chrome
	Seat binder	Cro-Moly	M6 x 23.5
Brakes		Alloy	Cantilevers
Drivetrain	Crankset	SR	Riveted rings
	BB	YST BB-613	
	Pedals	ATB nylon	
	F. derailleur	Shimano Tourney	Down pull, 28.6 mm / 1 1/8"
	R. derailleur	Shimano Tourney	
	Freewheel	Shimano HG22	6 speed
	Chain	KMC UG50	
Wheelset	Hubs	Alloy	Nutted f & r, threaded, 135 mm O.L.D.
	Rims	Weinmann 519	
	Tires	Kenda	Blackwall, 24 x 2.0
	Tubes	Schraeder	14 -- 64 81
	Spokes	Chrome plated	15 41 56 71
		Front	36 front and rear
		Rear- D/ND	239 15ga. 18 37 50 63
Weight		27.9 lbs.	21 31 43 54
Color		Dry Purple	24 28 37 47
			28 24 32 --

## Geometry and Fit

Size	11.5
Standover height	640
	25.2
Effective top tube	525
	20.7
Reach	612
	24.1
Head tube length	85
Handlebars	25.4 mm
Stem	22.2 mm
	Width
	Length
	Degrees rise
	Insertion
Seatpost	26.6 mm
Cranks	Length
Fork	Length
	Steerer length
	Offset
Trail	69
Head angle	70.5
Seat angle	74.5
Wheelbase	981
	38.6
Chainstay length	394
	15.5
Bottom bracket height	277
	10.9

## Maniac Notes

The Maniac shares the fit and performance concepts of the Tyro except its suspension ready, so the steering is correct with the SR DuoTrack suspension fork. Suspension adds comfort to the ride. More comfort means less fatigue, better bike control, and more hours of fun on the trail. Standover is slightly different because the suspension fork requires that the head tube be higher of the longer fork length.

### Upgrades from the Tyro

SR DuoTrack 7006

Our Price: \$\_\_\_\_\_

## General Specs

Frameset	Frame	Cro-Moly main tubes	HiTensile stays
	Fork	Cro-Moly	
	Headset	Steel	25.4/34.0/30.0, 35.0 mm stack height
Controls	Handlebars	Steel	
	Stem	Steel	
	Shifters	GripShift MRX-100	
	Brake levers	Alloy	
	Grips	Kraton	
Saddle		Fisher	"Supersoft" foam
	Seatpost	Aluminum alloy	Micro-adjust
	Seat binder	Kalloy	M6 x 55 quick release
Brakes		Shimano Altus CT91	
Drivetrain	Crankset	Shimano Altus CT91	Riveted rings
	BB	Shimano BB-CT91	68x116
	Pedals	ATB nylon	
	F. derailleur	Shimano Altus CT91	Down pull, 28.6 mm / 1 1/8"
	R. derailleur	Shimano Acera-X	
	Cassette	Shimano HG30	7 speed
	Chain	KMC UG50	
Wheelset	Hubs	Alloy QR	Compact HyperGlide cassette, 135 mm O.L.D.
	Rims	Weinmann 519 or Rigida AS 26	
	Tires	Kenda	24 32 38
	Tubes	Schraeder	26 x 1.95 11 -- 76 91
	Spokes	Chrome plated	13 48 65 77
		Front	36 front and rear
		Rear- D/ND	265 15ga. 15 42 56 66
Weight		28.2 lbs.	18 35 47 55
Color		Wild Cherry	21 30 40 47
		Titanium	24 26 35 42
			28 22 30 --

## Geometry and Fit

	13	15.5	16.75	18	19.5	15.5W	18W
Size	703	751	767	784	815	639	660
Standover height	27.7	29.6	30.2	30.9	32.1	25.2	26.0
	540	554	568	583	597	551	580
Effective top tube	21.3	21.8	22.4	23.0	23.5	21.7	22.8
	614	630	652	662	685	619	640
Reach	24.2	24.8	25.7	26.1	27.0	24.4	25.2
Head tube length	90	90	90	100	140	120	165
Handlebars	560	560	560	560	560	580	580
Stem	105	105	115	130	145	90	105
	15	15	15	15	15	15	15
	155	155	155	155	155	155	155
	155	155	155	155	155	155	155
Seatpost	300	300	350	350	350	250	300
Cranks	170	170	170	170	170	170	170
	123	143	163	183	203	143	183
	38	38	38	38	38	38	38
	74	74	71	71	71	74	71
	71	71	71.5	71.5	71.5	71	71.5
Head angle	74.5	74	74	73.5	73.5	74	73.5
Seat angle	1014	1025	1037	1048	1063	1019	1046
Wheelbase	39.9	40.4	40.8	41.3	41.9	40.1	41.2
	420	420	420	420	420	420	420
Chainstay length	16.5	16.5	16.5	16.5	16.5	16.5	16.5
	288	288	292	292	292	291	295
Bottom bracket height	11.3	11.3	11.5	11.5	11.5	11.5	11.6

## Wahoo Notes

The most affordable Fisher 'full size' mountain bike in the '96 line. Unlike many bikes in this price range, the Wahoo is a real mountain bike. Its not a modified city bike, but full Fisher geometry. We use Cro-Moly tubes where the thinner walls will yield the most improvement in ride- the main triangle and fork.

The Wahoo has an 1 1/8" headset for more steering rigidity. Still, this bike fits the 'recreational' category, so we offer the Wahoo in a step-through, or women's, frame style.

Marlin
General Specs

Table with 3 columns: Component, Material, and Specifications. Rows include Frameset, Controls, Saddle, Brakes, Drivetrain, Wheelset, Weight, and Color.

Geometry and Fit

Table with 6 columns: Component, Size, and five numerical values. Rows include Standover height, Effective top tube, Reach, Head tube length, Handlebars, Stem, Seatpost, Cranks, Head angle, Seat angle, Wheelbase, Chainstay length, and Bottom bracket height.

Marlin Notes

The Marlin's full Cro-Moly frame is light and stronger than one of HiTensile steel, so less steel is needed. The result is lighter tubing with more liveliness, but with no sacrifice in strength.

Upgrades from Wahoo

Table with 2 columns: Upgrade from Wahoo and Upgrade to Marlin. Rows include Full Cro-Moly frame, Acera-X chainrings, Tioga Psycho tires, and Stainless steel spokes.

Our Price: \$

High End Cro-Moly Steel

For 1996, even more of the Fisher line is built in the U.S., and Gary is very proud of this. There are a lot of reasons, best generalized as Quality, Jobs, Attention to Detail, and Less Environmental Impact.

Quality

Most of Gary's bikes are now being built in the U.S., and Gary really likes the quality that this produces. Gary knows his designs require extra work to get the geometry the way he wants it.

High Tech Welding

Many bikes are TIG welded, which means that while an electric arc from a Tungsten welding tip brings the frame tubes to their melting point, an Inert Gas is flowed over the red-hot part of the molten frame tubes.

First Gary designs the geometry of the bike. Then, working with True Temper, the high quality American Cro-Moly tubing manufacturer, he specs the tubing. This includes special tube sizes and thicknesses.

That's just the start. For accurate welded frames, the tubing lengths and miters should be really exact. Miters are the funny looking curves cut into the tubing ends to make two tubes fit together smoothly.

Most factories use a punch or a mill to miter their tubes. Either one leaves sharp, ragged edges to the tube, and as the cutter wears, its not as accurate so the tube lengths can vary.

Also, the tube is always cut at a 90° angle to the tube wall, so its always got a thick edge for better welding. When you weld, you actually melt the tube a bit. After it cools the melted portions are like one piece.

Another technique adding quality to Gary's bikes is the use of size specific jigs. A jig is a special device that holds the tubing in place while you weld it. Other factories use adjustable jigs so that they can build more models and brands of bikes, without having a lot of money tied up in jigs.

Then its time to do the welding. Each Gary Fisher frame is sequentially welded by hand. When you apply high heat to a metal, it tends to warp, sort of like the way a cookie sheet twists and pops in the oven. By following a special order, or sequence, of welds as the frame is assembled the warping is controlled by making the frame pull itself back into alignment.

After one of the welders has completed a frame, he or she stamps their initials into the bottom bracket shell. That's so we can monitor their work. Every single frame that comes from the welders is checked for alignment on an optical alignment table, plus they're also checked thoroughly for uniformity and good looks.

But after this visual check, we go the extra mile to guarantee frame quality. Frames are randomly checked throughout every shift with dye penetrant testing and even X-Ray. These special procedures show up things you can't see with the naked eye.

True Temper Tubing

Although all Gary's U.S. Cro-Moly bikes share the same geometry and similar manufacturing techniques, the high end models have extra hidden features which are important to your customer's riding enjoyment. The Aquila and Hoo Koo E Koo use triple butted True Temper tubing in their frames.



The X-Caliber and X-Caliber RX feature heat treated, triple butted OXIII tubing. Heat treating increases the strength of the steel so a lighter bike can be made of similar strength.

Gary's top of the line U.S. Cro-Moly bikes, starting with the Aquila, also have hidden features, like internal reinforcements in the head tube and seat tube to reinforce these critical areas while allowing the use of really light weight and oversize tubing. Seat stays are butted so that there is more material under the cantilever bosses, giving the brakes on Gary's bikes extra stopping power. The rear dropouts have a special shape so that the stays don't have to be crimped or dented at the dropout. The list goes on.

The Benefits of Steel

Although newer "high-tech" materials seem to do a better job attracting media attention, steel has a well deserved reputation as the king of bicycle tubing. Steel has been used for bikes since their first invention. Its durable and reliable. Its easy to work by cutting, drilling, filing, welding, bending, brazing, etc. And using steel allows fabrication of a structure which is strong and stiff.

The only place steel gives any advantage to these new materials is in the weight department. The density of steel is greater than aluminum or titanium, and especially compared to carbon composite.

New steel alloys, like Cro-Moly, and heat treated steels have helped some. HiTensile steel, Cro-Moly steel, and heat treated versions of Cro-Moly steel all have about the same modulus, or stiffness. Some steel alloys are stiffer, but aren't being used for bicycles because they may be brittle, or other reasons. The real difference between HiTensile steel and Cro-Moly is the strength.

By using Cro-Moly you can increase a bike's strength, and with stronger material less is required. This helps steel bikes in two ways. First, you can reduce the weight. Second, since less material is required, you can remove some of the stiffness of the frame because a good steel frame is already more than stiff enough. This adds to the liveliness and shock absorption. These are similar advantages as those gained by double or triple butting the tubes: Less weight and a more lively ride.

New for '96

The Fisher high-end steel bikes have recieved close scrutiny from Gary and our team of engineers. And we've spent a whole year listening to feedback from consumers and dealers to hear what they want. The result is several changes to increase the ride quality and fit of our steel bikes.

Fit changes: We heard from many riders that they would prefer a shorter head tube which would allow a lower handlebar position if desired. This change has been made, but at the same time we added Aheadset spacers so those preferring a higher position have not lost any adjustment.

Ride changes: By changing tubing diameters on our high-end steel bikes, we've increased strength, reduced weight slightly, and at the same time increased the ride quality. The changes are as follows: We decreased the top tube diameter from 31.8 mm to 30 mm. At the same time we increased the down tube diameter from 31.8 mm to 33 mm. This change also adds some bottom bracket torsional stiffness for really excellent pedal response when you're jamming up a hill or sprinting.

Aquila frame weight, 17.5": 2350 gm - 5.17 pounds

X-Caliber frame weight, 17.5": 2130 gm - 4.69 pounds

Our Price: \$

General Specs

Frameset	Frame	Cro-Moly	Double-butted
	Fork	Cro-Moly	
	Headset	Steel	25.4/34.0/30.0, 34.0 mm stack height
Controls	Handlebars	Aluminum alloy	
	Stem	Cro-Moly	
	Shifters	GripShift SRT-400	
	Brake levers	Alloy	
	Grips	Kraton	
Saddle	Seatpost	Fisher	"SuperSoft" foam
	Seat binder	Aluminum alloy	Micro-adjust
Brakes		Kalloy	M6 x 55 quick release
Drivetrain	Crankset	Shimano Acera-X	
	BB	Shimano Alivio	67 mm bolt hole circle
	Pedals	Shimano BB-LP26	73/113
	F. derailleur	Resin	Clips and straps
	R. derailleur	Shimano Acera-X	Top Swing, top pull, 28.6 mm / 1 1/8"
	Cassette	Shimano STX SGS	Long cage
	Chain	Shimano IG51	7 speed
Wheelset	Hub, rear.	KMC IG31	
	front	Shimano Acera-X	HyperGlide Compact cassette, 135 mm O.L.D.
	Rims	Alloy	
	Tires	Weinmann 519	26 x 1.95
	Tubes	Tioga Psycho KS/TS	
	Spokes	Presta	32 front and rear
		Stainless	268 15ga.
Weight		Front	265/267 15ga.
Color		Rear- D/ND	13.1 kg
		28.8 lbs.	
		Matte Copper	
		Ballistic Blue	

Geometry and Fit

Sizes	13	15.5	16.75	18	19.5			
Standover height	703	751	767	784	815		22	32 42
	27.7	29.6	30.2	30.9	32.1			
Effective top tube	540	554	568	583	597	11	--	76 100
	21.3	21.8	22.4	23.0	23.5	13	44	65 85
Reach	615	646	668	696	722	15	38	56 73
	24.2	25.4	26.3	27.4	28.4	18	32	47 61
Head tube length	105	125	145	165		21	27	40 52
Handlebars	25.4 mm	Width	560	560	560	24	24	35 46
Stem	25.4 mm	Length	90	105	120	28	21	30 --
		Degrees rise	10	10	15			
		Insertion	140	140	165			
Seatpost	26.6 mm	Length	300	350	350			
Cranks		Length	170	175	175			
		Toe clip length	M	M	L			
Fork		Steerer length	121	141	161			
		Offset	29	29	28			
		Trail	74	74	71			
Head angle			71	71	71.5			
Seat angle			74.5	74	74			
Wheelbase			1014	1025	1037			
			39.9	40.4	40.8			
Chainstay length			420	420	420			
			16.5	16.5	16.5			
Bottom bracket height			288	288	292			
			11.3	11.3	11.5			

Tassajara Notes

The Tassajara is for the more serious recreational rider, so we focused on saving weight. Start with a double butted Cro-Moly frame, which also adds ride quality.

It also has Shimano's IG, or Interactive Glide system for smooth, 'shockless' shifting both up and down the cassette or chainrings. The Alivio crank has a 22/32/42 combination for lower gear ranges so terrain is easier to tackle for the more serious rider. Complemented by the toe clips and straps.

Upgrades from the Marlin

Double butted Cro-Moly frame	GripShift SRT-400
Alloy bars and Cro-Moly stem	Alivio cranks with bolted on chainring set
Toe clips and straps	Acera-X brakes

Mamba

General Specs

Frameset	Frame	Cro-Moly	Double-buttet				
	Fork	Rock Shox Quadra 5	Elastomer suspension				
	Headset	Steel	25.4/34.0/30.0, 34.0 mm stack height				
Controls	Handlebars	Aluminum alloy					
	Stem	Cro-Moly					
	Shifters	GripShift SRT-400					
	Brake levers	Alloy					
	Grips	Kraton					
Saddle	Seatpost	Fisher	"SuperSoft" foam				
	Seat binder	Aluminum alloy	Micro-adjust				
		Kalloy	M6 x 55 quick release				
Brakes		Shimano Acera-X					
Drivetrain	Crankset	Shimano Alivio	67 mm bolt hole circle				
	BB	Shimano BB-LP26	73/113				
	Pedals	Resin	Clips and straps				
	F. derailleur	Shimano Acera-X	Top Swing, top pull, 28.6 mm / 1 1/8"				
	R. derailleur	Shimano STX SGS	Long cage				
	Cassette	Shimano IG51	7 speed				
	Chain	KMC IG31					
Wheelset	Hub, rear	Shimano Acera-X	HyperGlide Compact cassette, 135 mm O.L.D.				
	front	Alloy	Oversize axle		22	32	42
	Rims	Weinmann 519		11	--	76	100
	Tires	Tioga Psycho KS/TS	26 x 1.95	13	44	65	85
	Tubes	Presta		15	38	56	73
	Spokes	Stainless	32 front and rear	18	32	47	61
		Front	268 15ga.	21	27	40	52
		Rear- D/ND	265/267 15ga.	24	24	35	46
Weight		27.0 lbs	12.3 kg	28	21	30	--
Color		Black Sable					

Geometry and Fit

Sizes			13	15.5	16.75	18	19.5
Standover height			711	756	770	790	822
			28.0	29.8	30.3	31.1	32.4
Effective top tube			540	554	568	583	597
			21.3	21.8	22.4	23.0	23.5
Reach			615	646	668	696	722
			24.2	25.4	26.3	27.4	28.4
Head tube length			85	105	125	145	165
Handlebars	25.4 mm	Width	560	560	560	560	560
Stem	25.4 mm	Length	90	105	120	135	150
		Degrees rise	10	10	15	15	15
		Insertion	140	140	165	165	165
Seatpost	26.6 mm	Length	300	350	350	350	350
Crankset		Length	170	175	175	175	175
		Toe clips size	M	M	M	L	L
Fork		Steerer length	119	139	159	179	199
		Offset	38	38	38	38	38
Trail			74	74	71	71	66
Head angle			71	71	71.5	71.5	71.5
Seat angle			74.5	74	74	73.5	73.5
Wheelbase			1016	1028	1040	1051	1065
			40.0	40.5	40.9	41.4	41.9
Chainstay length			420	420	420	420	420
			16.5	16.5	16.5	16.5	16.5
Bottom bracket height			291	288	292	292	292
			11.5	11.3	11.5	11.5	11.5

Mamba Notes

This is a suspended version of the Tassajara. The Quadra 5 fork adds comfort to the ride. With suspension, the rider can relax while the front wheel does the up and down moving over bumps. This means less energy is used by the rider so they feel less fatigue at the end of a ride. Also it means that the front wheel stays on the ground more for better control in steering and braking. The oversize front axle adds steering rigidity to this fork. Of course, what that comfort really does is lets you go farther and faster. For more fun!

Upgrades from the Tassajara

Rock Shox Quadra 5 Suspension front axle

Our Price: \$

Aquila

Our Price: \$

General Specs

Frameset	Frame	True Temper	Triple-buttet Cro-Moly				
	Fork	Cro-Moly					
	Headset	Tange Seiki Passage	25.4/34.0/30.0, 33.4 mm stack height				
Controls	Handlebars	Aluminum alloy					
	Bar ends	Fisher Fishsticks					
	Stem	Cro-Moly	Alloy wedge				
	Shifters	GripShift SRT-400					
	Brake levers	Dia-Compe PC-7N	w/reach adjusters				
	Grips	Kraton					
Saddle	Seatpost	Bontrager Plus 10					
	Seat binder	Alloy	Micro-adjust				
		Fisher Steel	31.8 mm clamp w/integral QR				
Brakes		Shimano Alivio					
Drivetrain	Crankset	Sugino Impel 300	SS3 chainrings, 58/94 mm bolt hole circle				
	BB	Shimano BB-LP26	73/113				
	Pedals	Resin	Steel cage, clips and straps				
	F. derailleur	Shimano Alivio	Top Swing, top pull, 31.8 mm / 1 1/4"				
	R. derailleur	Shimano STX SGS	Long cage				
	Cassette	Shimano STX	7 speed				
	Chain	Shimano IG31					
Wheelset	Hub, rear	Shimano Alivio	Compact HyperGlide cassette, 135 mm O.L.D.				
	front	Alloy	Oversize axle		20	32	42
	Rims	Matrix Lobo	Welded, machined, brushed	11	--	76	100
	Tires	Tioga Psycho KS/TS	26 x 1.95, racing tread, steel bead	13	40	65	85
	Tubes	Presta		15	35	56	73
	Spokes	DT or Union Stainless	32 front and rear	18	29	47	61
		Front	269 15ga.	21	25	40	52
		Rear- D/ND	267/268 15ga.	24	22	35	46
Weight		26.7 lbs.	12.1 kg	28	19	30	--
Color		Matte Violet					
		Matte White					

Geometry and Fit

Sizes			11.5	15.5	16.75	18	19.5
Standover height			681	737	763	787	816
			26.8	29.0	30.0	31.0	32.1
Effective top tube			537	554	568	583	597
			21.1	21.8	22.4	23.0	23.5
Reach			619	646	673	702	729
			24.4	25.4	26.5	27.6	28.7
Head tube length			85	85	105	125	145
Handlebars	25.4 mm	Width	560	560	560	560	560
Stem	25.4 mm	Length	90	105	120	135	150
		Degrees rise	5	5	10	10	10
		Insertion	130	130	150	150	150
Cranks		Length	170	175	175	175	175
		Toe clip size	M	M	L	L	L
Seatpost	27.2 mm	Length	300	350	350	350	350
Fork		Steerer length	123	123	143	163	183
		Offset	38	38	38	38	38
Trail			77	74	71	71	71
Head angle			70.5	71	71.5	71.5	71.5
Seat angle			74	74	74	73.5	73.5
Wheelbase			1012	1025	1037	1048	1063
			39.8	40.4	40.8	41.3	41.9
Chainstay length			420	420	420	420	420
			16.5	16.5	16.5	16.5	16.5
Bottom bracket height			288	291	295	295	295
			11.3	11.5	11.6	11.6	11.6

Aquila Notes

The Aquila's frameset is "fully featured", with head tube and seat tube inserts, medium diameter tubing, and True Temper double butted tubing. This means extra performance through lighter weight, increased frame rigidity for pedaling efficiency and steering control.

U.S. made Matrix rims are welded, then machined for smooth braking.

Upgrades from Mamba

Full featured True Temper frame  
Alivio front derailleur

Sugino cranks with 20T inner ring  
Matrix Lobo rims Fisher Fishsticks bar ends

**Hoo Koo E Koo**

**Our Price: \$** \_\_\_\_\_

## General Specs

Frameset	Frame	True Temper	Triple-butted Cro-Moly				
	Fork	Rock Shox Quadra 21R	Micro-cellular elastomer suspension				
Controls	Headset	Dia-Compe ST-2	25.4/34.0/30.0, 25.5 mm stack height				
	Handlebars	Aluminum alloy					
	Bar ends	Fisher Fishsticks					
	Stem	Alloy	Ahead				
	Shifters	GripShift SRT-400					
	Brake levers	Dia-Compe PC-7N	w/reach adjusters				
Saddle	Grips	Kraton					
		Bontrager Plus 10					
Brakes	Seatpost	Alloy	Micro-adjust				
	Seat binder	Fisher Steel	31.8 mm clamp w/ integral QR				
Drivetrain		Shimano Alivio					
	Crankset	Sugino Impel 300	SS3 chainrings, 58/94 mm bolt hole circle				
	BB	Shimano BB-LP26	73/113				
	Pedals	Resin	Steel cage, clips and straps				
	F. derailleur	Shimano Alivio	Top Swing, top pull, 31.8 mm / 1 <sup>1</sup> / <sub>4</sub> "				
	R. derailleur	Shimano STX SGS	Long cage				
	Cassette	Shimano STX	7 speed				
	Chain	Shimano IG31					
	Hub, rear	Shimano Alivio	Compact HyperGlide cassette, 135 mm O.L.D.				
Wheelset	front	Fisher Ginzu Team	12 mm suspension axle, 6 mm skewer				
	Rims	Matrix Lobo	Welded, machined, brushed	<b>20</b>	<b>32</b>	<b>42</b>	
	Tires	Tioga Psycho-KS/TS	26 x 1.95, racing tread, steel bead	<b>11</b>	--	76	100
	Tubes	Presta					
	Spokes	DT or Union Stainless	32 front and rear	<b>13</b>	40	65	85
		Front	269 15ga.	<b>15</b>	35	56	73
		Rear- D/ND	267/268 15ga.				
		27.0 lbs.	12.3 kg	<b>18</b>	29	47	61
Weight			<b>21</b>	25	40	52	
Color	Matte P.C. Green		<b>24</b>	22	35	46	
<b>Geometry and Fit</b>			<b>28</b>	19	30	--	

## Geometry and Fit

Sizes		11.5	15.5	16.75	18	19.5
Standover height	681	737	763	787	816	
Effective top tube	537	26.8	29.0	30.0	31.0	32.1
Reach		554	568	583	597	
Head tube length		21.1	21.8	22.4	23.0	23.5
Handlebars 25.4 mm	Width	619	646	673	702	729
Stem, 41 mm clamp ht.	Length	24.4	25.4	26.5	27.6	28.7
	Degrees rise	85	85	105	125	145
Cranks	Length	560	560	560	560	560
	Toe clip size	90	105	120	135	150
Seatpost 27.2mm	Length	5	10	10	10	10
Fork	Steerer length	170	175	175	175	175
	Offset	M	M	L	L	L
Trail		300	350	350	350	350
Head angle		158	158	178	198	218
Seat angle		38	38	38	38	38
Wheelbase		77	74	71	71	71
		70.5	71	71.5	71.5	71.5
		74	74	74	73.5	73.5
		1012	1025	1037	1048	1063
Chainstay length		39.8	40.4	40.8	41.3	41.9
		420	420	420	420	420
Bottom bracket height		16.5	16.5	16.5	16.5	16.5
		288	291	295	295	295
		11.3	11.5	11.6	11.6	11.6

## Hoo Koo E Koo Notes

This is a suspended version of the Aquila. The Hoo Koo E Koo's Rock Shox Quadra 21R suspension fork uses the same micro-cellular elastomers as the Judy. Along with the suspension, we wanted to add more steering control, so the Hoo Koo gets an Aheadset for increased handlebar rigidity. And the Fisher Ginzu Team front hub uses a 12 mm Cro-Moly axle with a 6 mm skewer- about twice as stiff as a 10 mm axle set.

## Upgrades from the Aquila

Rock Shox Quadra 21R  
Fisher Ginzu Team front hub

Aheadset system headset and stem

# X-Caliber

**Our Price: \$**\_\_\_\_\_

## General Specs

Frameset	Frame	True Temper OX-3	Triple-buttressed Heat Treated Cro-Moly				
	Fork	Cro-Moly	Quad butted				
Controls	Headset	Dia-Compe SA-2	25.4/34.0/30.0, 26.5 mm stack height				
	Handlebars	Bontrager Race	Aluminum alloy				
	Bar ends	Fisher Fish Fins	Welded aluminum				
	Stem	Aluminum	Ahead				
	Shifters	GripShift SRT-800 X-Ray					
	Brake levers	Dia-Compe PC-7N	w/reach adjusters				
Saddle	Grips	Kraton					
		Bontrager Plus 10	Hollow Cro-Moly rails				
	Seatpost	Bontrager Comp	Aluminum alloy				
Brakes	Seat binder	Fisher Steel	31.8 mm clamp w/integral bolt				
Drivetrain		Shimano LX					
	Crankset	Sugino Impel 700	SS3 hard anodized chainrings, 58/94 mm bolt hole circle				
	BB	Shimano BB-UN52	73/113				
	Pedals	Shimano M535 SPD	Clipless, w/float				
	F. derailleur	Shimano LX	Top Swing, top pull, 31.8 mm / 1 1/4"				
	R. derailleur	Shimano XT SGS	Long cage				
	Cassette	Shimano LX	8 speed				
	Chain	Shimano IG70					
Wheelset	Hub, rear	Shimano LX	Compact HyperGlide cassette, 135 mm O.L.D.				
	front	Fisher Ginzu Team	12 mm Cro-Moly suspension axle, 6 mm skewer				
	Rims	Bontrager BCX-1					
	Tires	Tioga Psycho-K/T	26 x 1.95, racing tread, Kevlar bead				
	Tubes	Presta					
	Spokes	DT or Union Stainless	32 front and rear				
Weight	Front	270 15ga.					
	Rear- D/ND	268/269 15ga.					
		24.1 lbs.	10.9 kg				
	Color	Matte Copper					

Geometry and Fit

20

32

42

11

--

76

100

12

44

70

92

14

37

60

79

16

33

52

69

18

29

47

61

21

25

40

52

## Geometry and Fit

Sizes					11.5	15.5	16.75	18	19.5
Standover height					681	737	763	787	816
					26.8	29.0	30.0	31.0	32.1
Effective top tube					537	554	568	583	597
					21.1	21.8	22.4	23.0	23.5
Reach					619	646	673	702	729
					24.4	25.4	26.5	27.6	28.7
Head tube length					85	85	105	125	145
Handlebars	25.4mm		Width		560	560	560	560	560
Stem, 41 mm clamp ht.			Length		90	105	120	135	150
			Degrees rise		5	10	10	10	10
Cranks			Length		170	175	175	175	175
Seatpost	27.2mm		Length		300	350	350	350	350
Fork			Steerer length		170	170	190	210	230
			Offset		38	38	38	38	38
Trail					77	74	71	71	71
Head angle					70.5	71	71.5	71.5	71.5
Seat angle					74	74	74	73.5	73.5
Wheelbase					1012	1025	1037	1048	1063
					39.8	40.4	40.8	41.3	41.9
Chainstay length					420	420	420	420	420
					16.5	16.5	16.5	16.5	16.5
Bottom bracket height					288	291	295	295	295
					11.3	11.5	11.6	11.6	11.6

## X-Caliber Notes

The X-Caliber takes our full featured steel frameset to a new level. True Temper OX-3 tubing is heat treated for extra strength, and *triple* butted so less material is required. The result is a lighter, more lively ride. With this nice of a frame, it's only natural to use a quad butted fork.

To compliment this competition level frameset, we've spec'd 8 speeds, a lighter wheelset, and clipless pedals.

## Upgrades from the Hoo Koo E Koo

True Temper OX-3 triple butted frame  
Bontrager seatpost, handlebars with FishFins  
Shimano M535 SPD clipless pedals

Quad butted fork  
Psycho K Kevlar beaded tires  
Hollow Cro-Moly saddle rails

8 speed with LX/XT  
BCX-1 rims

# X-Caliber RX

Our Price: \$ \_\_\_\_\_

## General Specs

Frameset	Frame	True Temper OX-3	Triple-buttet heat Treated Cro-Moly
	Fork	Rock Shox Judy XC	MCU elastomers w/adjustable compression damping
Controls	Headset	Dia-Compe SA-2	25.4/34.0/30.0, 26.5 mm stack height
	Handlebars	Bontrager Race	Aluminum alloy
	Bar ends	Fisher Fish Fins	Welded aluminum
	Stem	Aluminum	Ahead
	Shifters	GripShift SRT-800 X-Ray	
	Brake levers	Dia-Compe PC-7N	w/reach adjusters
	Grips	Kraton	
Saddle		Bontrager Plus 10	Hollow Cro5saly rails
	Seatpost	Bontrager Comp	Aluminum alloy
Brakes	Seat binder	Fisher Steel	31.8 mm clamp w/integral bolt
		Shimano LX	
Drivetrain	Crankset	Sugino Impel 700	SS3 hard anodized chainrings, 58/94 mm bolt hole circle
	BB	Shimano BB-UN52	73/113
	Pedals	Shimano M535 SPD	Clipless, w/float
	F. derailleur	Shimano LX	Top Swing, top pull, 31.8 mm / 1 1/4"
	R. derailleur	Shimano XT SGS	Long cage
	Cassette	Shimano LX	8 speed
	Chain	Shimano IG70	
	Hub, rear	Shimano LX	Compact HyperGlide cassette, 135 mm O.L.D.
	front	Fisher Ginzu Team	12 mm Cro-Moly suspension axle, 6 mm skewer
	Rims	Bontrager BCX-1	
Wheelset	Tires	Tioga Psycho-K/T	26 x 1.95, racing tread, Kevlar bead
	Tubes	Presta	
	Spokes	DT or Union Stainless	32 front and rear
		Front	270 15ga.
		Rear: D/ND	268/269 15ga.
Weight		25.2 lbs.	11.4 kg
Color		Matte Copper	

## Geometry and Fit

Sizes	11.5	15.5	16.75	18	19.5
Standover height	681	737	763	787	816
Effective top tube	26.8	29.0	30.0	31.0	32.1
	537	554	568	583	597
Reach	21.1	21.8	22.4	23.0	23.5
	619	646	673	702	729
Head tube length	24.4	25.4	26.5	27.6	28.7
	85	85	105	125	145
Handlebars 25.4mm	560	560	560	560	560
Stem, 41 mm clamp ht.	90	105	120	135	150
Cranks					
	Length	5	10	10	10
Seatpost 27.2mm	170	175	175	175	175
Fork	Length	300	350	350	350
	Steerer length	160	160	180	200
Trail	Offset	38	38	38	38
		77	74	71	71
Head angle	70.5	71	71.5	71.5	71.5
Seat angle	74	74	74	73.5	73.5
Wheelbase	1012	1025	1037	1048	1063
Chainstay length	39.8	40.4	40.8	41.3	41.9
	420	420	420	420	420
Bottom bracket height	16.5	16.5	16.5	16.5	16.5
	288	291	295	295	295
	11.3	11.5	11.6	11.6	11.6

## X-Caliber RX Notes

This is the suspended version of the X-Caliber. With its Judy XC fork, the X-Caliber RX is a bike any NORBA pro would enjoy.

### Upgrades from the X-Caliber

Rock Shox Judy XC

# Lower Weight: Aluminum

One of the first question we seem to always ask about a bike is "How much does it weigh?" The answer can sound a lot like a fishing story and although its usually somewhere close to the truth, weight has become so important in bicycling that the truth is often stretched just to impress others or bolster egos.

Have you ever asked yourself why the weight of a bike is so important? Its easy to answer that it makes the bike ride better. Or you could make light of the question by saying that light bikes are easier to put on a roof rack. Most shop guys know the old joke "At our store, we don't carry that brand because none of us are strong enough".

So how did we get so worried about weight in the first place? Lets look back a few years. In the "olden days", light weight road bikes were made of steel using a lugged and brazed construction. Brazing allowed the use of thin walled tubing, while the welding technology of the time required much thicker tubes for adequate weld strength. Since butting, due to it's cost, was restricted to expensive racing bikes, these inexpensive welded bikes were stuck with heavy straight gauge tube sets. A common weight for this type of bike was around 35-40 pounds. Boy have we come a long way!

While a 35 pound bike required more effort to pedal, the real problem was how they rode. The thicker tubing was very stiff, and had no resiliency to give life to the bike so they felt dead. This feel was not because of the weight itself, but because the frame was built with thick tubing which wouldn't absorb shock and couldn't transmit road feel.

So here's the key: Generally, better bikes use stronger materials in the frame. Since the materials are stronger, you need less of them, so the tubing can be made thinner overall. In addition, butting a tube removes material from the middle of the tube which further thins out the tubing walls without effecting the strength of the bike. As we thin out the tubing walls, we add liveliness to the frame for a better ride. And the weight comes down.

So there you have it, lighter bikes ride better. But rather than their lower weight, its because their frames have a better feel. But there are other ways to effect the feel of a bike besides just changing the weight. The design and materials of the frame and even the quality of manufacturing can make a difference in how a bike rides.

### Removing weight without removing performance.

Although we'd all agree that lighter is better, we'd also agree that this is only true if you don't give up any performance in the trade. Bikes that are whippy, or short in life span, are to be shunned regardless of how they tip the scales.

So how do you remove the most weight possible while maintaining performance? An easy answer not available to bike designers just a few years ago is the use of high tech materials like aluminum, titanium, or carbon fiber. Of these, aluminum has shown itself to be the most cost effective.

### Aluminum

The use of aluminum, or more correctly aluminum alloys, has allowed reduction in bike weights while actually enhancing some performance characteristics of the bike. Aluminum alloys have a low density, or weight per unit volume, so you can use more material and still reduce the weight of a comparable steel bike by about a pound.

Another advantage of aluminum is that you can easily make larger or different tube shapes and incorporate more radical butting. This allows an aluminum bike to better address the particular stiffness and strength requirements of a bicycle frame.

The end result of using aluminum is a lightweight bike with excellent stiffness and strength characteristics. This can be done at a reasonable cost, because aluminum alloys are not much more expensive than Cro-Moly steel. A further benefit of aluminum is its inherent shock absorbing qualities; its modulus adds comfort to the ride as an extra bonus.

### Gary's Aluminum Frame Details

Of course, not all aluminum bikes are the same. Gary has spec'd specific tube diameters and wall thicknesses to optimize the benefits of aluminum. By specing 6061, not only are Gary's bikes light and strong, but they also have high fatigue resistance. 6061 exhibits a much better elongation, or ductility, than 7005 aluminum for a longer life.

Fisher aluminum bikes use a special seat cluster design with a welded insert in the top of the seat tube. This inset allows more beef for all the welds at the seat cluster, while resisting deformation from the heat. It also reinforces this area, and allows the use of a 27.2 seat post with a large diameter, thin-walled seat tube. Other details easily seen on Fisher bikes are the replaceable derailleur hanger, the Anti Chain Suck Device, and the large reinforcing gusset under the down tube which greatly adds the fatigue resistance of Fisher aluminum bikes. The head tube is externally reinforced to provide more support for the headset.

### New Features for '96

The biggest change for this year is the use of short-buttet tubes on the Paragon, Mt. Tam, and Supercaliber. With this new radical tube set, Gary has pared the frame weight down from the respectably light 3.9 pounds of the Kaitai to an incredible 3.2 pounds for the top end aluminum models.



# Kaitai

## General Specs

Frameset	Frame	6061 T6 aluminum	TIG welded				
	Fork	Cro-Moly					
	Headset	Tange Seiki Passage	25.4/34.0/30.0, 33.4 mm stack height				
Controls	Handlebars	Aluminum alloy					
	Bar ends	Fisher Fishsticks					
	Stem	Cro-Moly	Alloy wedge				
	Shifters	GripShift SRT-400					
	Brake levers	Dia-Compe PC-7N	W/reach adjusters				
	Grips	Kraton					
Saddle		Bontrager Plus 10					
	Seatpost	Alloy	Micro-adjust				
	Seat binder	Fisher Aluminum	35 mm clamp w/QR				
Brakes		Shimano Alivio					
Drivetrain	Crankset	Sugino Impel 350	SS3 chainrings, 58/94 mm bolt hole circle				
	BB	Shimano BB-LP26	73/113				
	Pedals	Resin	Steel cage, clips and straps				
	F. derailleur	Shimano Alivio	Top Swing, top pull, 34.9 mm / 1 3/8"				
	R. derailleur	Shimano STX SGS	Long cage				
	Cassette	Shimano STX	7 speed				
	Chain	Shimano IG31					
Wheelset	Hub, rear	Shimano Alivio	Compact HyperGlide cassette, 135 mm O.L.D.				
	front	Alloy	Overdose axle	20	32	42	
	Rims	Matrix Lobo	Welded, machined, brushed				
	Tires	Tioga Psycho-KS/TS	26 x 1.95, racing tread, steel bead	11	--	76	100
	Tubes	Presta		13	40	65	85
	Spokes	DT or Union Stainless	32 front and rear	15	35	56	73
		Front	269 15ga.	18	29	47	61
		Rear- D/ND	267/268 15ga.	21	25	40	52
Weight		26.0 lbs.	11.8 kg	24	22	35	46
Color		Slate		28	19	30	--

## Geometry and Fit

Sizes	14	16	17.5	19.5
Standover height	721	759	785	821
	28.4	29.9	30.9	32.3
Effective top tube	554	568	583	597
	21.8	22.4	23.0	23.5
Reach	646	673	702	729
	25.4	26.5	27.6	28.7
Head tube length	90	105	125	145
Handlebars	25.4 mm	Width	560	560
Stem	25.4 mm	Length	105	120
		Degrees rise	5	5
		Insertion	130	130
Seatpost	27.2 mm	Length	300	350
Cranks		Length	170	175
		Toe Clip size	M	M
Forks		Steerer length	128	143
		Offset	38	38
Trail			74	74
Head angle			71	71.5
Seat angle			74	74
Wheelbase			1028	1040
			40.5	40.9
Chainstay length			420	420
			16.5	16.5
Bottom bracket height			290	295
			11.4	11.6

## Kaitai Notes

This is the same frame as the Montare, but with a more affordable parts selection. In other words, it's a really hot bike. Frame weight is only 3.9 pounds, it's got Gary's geometry, and the spec is right on. To show it's a serious bike, we even put on bar ends.

### Upgrades from the Aquila

6061 T6 Aluminum frame  
Sugino Impel 350 cranks and 20T chainring

Our Price: \$

Our Price: \$

# Big Sur

## General Specs

Frameset	Frame	6061 T6 aluminum	TIG welded				
	Fork	Rock Shox Quadra 5	Elastomer suspension				
	Headset	Tange Seiki ST-2	25.4/34.0/30.0, 25.5 mm stack height				
Controls	Handlebars	Aluminum alloy					
	Bar ends	Fisher Fishsticks					
	Stem	Alloy	Ahead				
	Shifters	GripShift SRT-400					
	Brake levers	Dia-Compe PC-7N	W/reach adjusters				
	Grips	Kraton					
Saddle		Bontrager Plus 10					
	Seatpost	Alloy	Micro-adjust				
	Seat binder	Fisher Aluminum	35 mm clamp w/QR				
Brakes		Shimano Alivio					
Drivetrain	Crankset	Sugino Impel 350	SS3 chainrings, 58/94 mm bolt hole circle				
	BB	Shimano BB-LP26	73/113				
	Pedals	Resin	Steel cage, clips and straps				
	F. derailleur	Shimano Alivio	Top Swing, top pull, 34.9 mm / 1 3/8"				
	R. derailleur	Shimano STX SGS	Long cage				
	Cassette	Shimano STX	7 speed				
	Chain	Shimano IG31					
Wheelset	Hub, rear	Shimano Alivio	Compact HyperGlide cassette, 135 mm O.L.D.				
	front	Fisher Ginzu Team	12 mm Cro-Moly axle, 6 mm skewer				
	Rims	Matrix Lobo	Welded, machined, brushed	20	32	42	
	Tires	Tioga Psycho-KS/TS	26 x 1.95, racing tread, steel bead	11	--	76	100
	Tubes	Presta		13	40	65	85
	Spokes	DT or Union Stainless	32 front and rear	15	35	56	73
		Front	269 15ga.	18	29	47	61
		Rear- D/ND	267/268 15ga.	21	25	40	52
Weight		26.4 lbs.	12.0 kg	24	22	35	46
Color		Gloss Onyx Black		28	19	30	--

## Geometry and Fit

Sizes	14	16	17.5	19.5
Standover height	721	759	785	821
	28.4	29.9	30.9	32.3
Effective top tube	554	568	583	597
	21.8	22.4	23.0	23.5
Reach	646	673	702	729
	25.4	26.5	27.6	28.7
Head tube length	90	105	125	145
Handlebars	25.4 mm	Width	560	560
Stem, 41 mm clamp ht.		Length	105	120
		Degrees rise	10	10
Seatpost	27.2 mm	Length	300	350
Cranks		Length	170	175
		Toe Clip size	M	M
Forks		Steerer length	163	178
		Offset	38	38
Trail			74	74
Head angle			71	71.5
Seat angle			74	74
Wheelbase			1028	1040
			40.5	40.9
Chainstay length			420	420
			16.5	16.5
Bottom bracket height			290	295
			11.4	11.6

## Big Sur Notes

The Big Sur is a suspended version of the Kaitai, so we added a Fisher Ginzu Team suspension hub and skewer which is about twice as stiff as a 10 mm Cro-Moly axle. We also spec'd the Aheadset system to get the most steering rigidity possible with the fork.

### Upgrades from the Kaitai

Rock Shox Quadra 5 suspension fork  
Aheadset and Ahead stem  
Fisher Ginzu Team suspension hub w/ 12 mm Cro-Moly axle and 6 mm skewer

Montare

General Specs

Frameset	Frame	6061 T6 aluminum	Micro-cellular elastomer suspension 25.4/34.0/30.0, 26.5 mm stack height		
	Fork	Rock Shox Quadra 21R			
Controls	Headset	Dia-Compe SA-2	Ahead		
	Handlebars	Aluminum alloy			
	Bar ends	Fisher Fishsticks			
	Stem	Aluminum			
	Shifters	GripShift SRT-600			
Saddle	Brake levers	Dia-Compe PC-7N	w/reach adjusters		
	Grips	Kraton			
	Bontrager Plus 10				
Brakes	Seatpost	Alloy	Micro-adjust 35 mm clamp w/QR		
	Seat binder	Fisher Aluminum			
Drivetrain	Shimano STX-RC				
	Shimano Impel 500				
Wheelset	BB	Shimano BB-LP26	SS3 chainrings, 58/94 mm bolt hole circle 73/113 Clips and straps Top Swing, top pull, 34.9 mm / 1 3/8" Long cage 8 speed		
	Pedals	Alloy			
	F. derailleur	Shimano STX			
	R. derailleur	Shimano LX SGS			
	Cassette	Shimano LX			
	Chain	Shimano IG51			
	Hub, rear	Shimano LX			
	front	Fisher Ginzu Team			
	Rims	Matrix Lobo			
	Tires	Tioga Psycho-KS/TS			
Weight	Tubes	Presta	Compact HyperGlide cassette, 135 mm O.L.D. 12 mm suspension axle w/ 6 mm skewer Welded, machined, brushed 26 x 1.95, racing tread, steel bead		
	Spokes	DT or Union Stainless			
	Front				
	Rear- D/ND				
Color	25.9 lbs.		11.8 kg		
	Blasted Aluminum				

Geometry and Fit

Sizes	14	16	17.5	19.5
Standover height	721	759	785	821
Effective top tube	28.4	29.9	30.9	32.3
Reach	554	568	583	597
Head tube length	21.8	22.4	23.0	23.5
Handlebars 25.4mm	646	673	702	729
Stem, 41 mm clamp ht.	25.4	26.5	27.6	28.7
Seatpost 27.2mm	90	105	125	145
Cranks	105	120	135	150
Forks	10	10	10	10
Trail	300	350	350	350
Head angle	170	175	175	175
Seat angle	M	M	L	L
Wheelbase	164	179	199	219
Chainstay length	38	38	38	38
Bottom bracket height	74	74	74	74
	71	71.5	71.5	71.5
	74	74	73.5	73.5
	1028	1040	1051	1065
	40.5	40.9	41.4	41.9
	420	420	420	420
	16.5	16.5	16.5	16.5
	290	295	295	295
	11.4	11.6	11.6	11.6

Montare Notes

This is our lowest priced aluminum frame with 8 speed cassette and suspension fork. These features qualify the Montare as a budget NORBA racer.

Upgrades from the Kaitai

- Rock Shox Quadra 21R suspension fork
- 8 speed, w/ GripShift SRT-600 with Shimano LX rear derailleur and hub
- Alloy pedals
- Shimano STX-RC brakes
- Sugino Impel 500 cranks with 2 alloy rings

Our Price: \$

Paragon

Our Price: \$

General Specs

Frameset	Frame	Easton	Short butted 6061 T6 aluminum MCU elastomer suspension 25.4/34.0/30.0, 26.5 mm stack height		
	Fork	Manitou Mach 5 Pro			
Controls	Headset	Dia-Compe SA-2	Aluminum Welded aluminum Ahead X-Ray W/reach adjusters		
	Handlebars	Bontrager Race			
	Bar ends	Fisher FishFins			
	Stem	Alloy			
	Shifters	GripShift SRT-800			
Saddle	Brake levers	Dia-Compe PC-7N	Hollow Cro-Moly rails Aluminum 35 mm clamp w/integral bolt		
	Grips	Kraton			
	Bontrager Plus 10				
Brakes	Seatpost	Bontrager Comp			
	Seat binder	Fisher Aluminum			
Drivetrain	Shimano LX				
	Sugino Impel 700				
Wheelset	BB	Shimano BB-UN52	SS3 hard anodized rings, 58/94 mm bolt hole circle 73/113 Clipless, w/float Top Swing, top pull, 34.9 mm / 1 3/8" Long cage 8 speed		
	Pedals	Shimano M535 SPD			
	F. derailleur	Shimano LX			
	R. derailleur	Shimano XT SGS			
	Cassette	Shimano LX			
	Chain	Shimano IG70			
	Hub, rear	Shimano LX			
	front	Fisher Ginzu Team			
	Rims	Bontrager BCX-1			
	Tires	Tioga Psycho-K/T			
Weight	Tubes	Presta	Compact HyperGlide cassette, 135 mm O.L.D. 12 mm Cro-Moly suspension axle, 6 mm skewer		
	Spokes	DT or Union Stainless			
	Front				
	Rear- D/ND				
Color	25.0 lbs.		11.3 kg		
	Ballistic Blue				

Geometry and Fit

Sizes	14	16	17.5	19.5
Standover height	721	759	785	821
Effective top tube	28.4	29.9	30.9	32.3
Reach	554	568	583	597
Head tube length	21.8	22.4	23.0	23.5
Handlebars 25.4mm	646	673	702	729
Stem, 41 mm clamp ht.	25.4	26.5	27.6	28.7
Seatpost 27.2mm	90	105	125	145
Cranks	105	120	135	150
Forks	10	10	10	10
Trail	300	350	350	350
Head angle	170	175	175	175
Seat angle	164	179	199	219
Wheelbase	38	38	38	38
Chainstay length	74	74	74	74
Bottom bracket height	71	71.5	71.5	71.5
	74	74	73.5	73.5
	1028	1040	1051	1065
	40.5	40.9	41.4	41.9
	420	420	420	420
	16.5	16.5	16.5	16.5
	290	295	295	295
	11.4	11.6	11.6	11.6

Paragon Notes

Not just a "Budget Racer", the Paragon could set the standard for a NORBA race bike, but its better than a standard value. Fully race ready, this is a radically butted 6061 T6 frame resulting in a weight of just 3.2 pounds. A host of high performance parts including Bontrager bars and seatpost, Shimano M535 SPD clipless pedals, and the Manitou Mach 5 fork make this bike ready to race right out of the box.

Upgrades from the Montare

- Easton short butted frame
- Sugino Impel 700 cranks
- Shimano LX/XT derailleurs
- Bontrager bars and seatpost
- Manitou Mach 5 Pro suspension fork
- BB-UN52 bottom bracket
- Shimano M535 SPD clipless pedals
- Psycho K/T tires w/Kevlar beads
- GripShift SRT-800 X-Ray
- Shimano IG70 chain
- Bontrager BCX-1 rims
- Hollow Cro-Moly saddle rails

# Mt. Tam

## General Specs

Frameset	Frame	Easton	Short butted 6061 T6 aluminum
	Fork	Rock Shox Judy XC	MCU elastomers with adjustable compression damping
	Headset	Dia-Compe SA-2	25.4/34.0/30.0, 26.5 mm stack height
Controls	Handlebars	Bontrager Race	Aluminum
	Bar ends	Fisher FishFins	Welded aluminum
	Stem	Alloy	Ahead
	Shifters	Shimano LX	
	Brake levers	Shimano LX	W/reach adjusters
	Grips	Fisher Hex	High density foam
Saddle		Bontrager	Hollow Cro-Moly rails, leather cover
	Seatpost	Bontrager Comp	Aluminum
	Seat binder	Fisher Aluminum	35 mm clamp w/integral bolt
Brakes		Shimano LX	
Drivetrain	Crankset	Shimano LX	58/94 mm bolt hole circle
	BB	Shimano BB-UN52	73/113
	Pedals	Shimano M535 SPD	Clipless, w/float
	F. derailleur	Shimano LX	Top Swing, top pull, 34.9 mm / 1 3/8"
	R. derailleur	Shimano XT SGS	Long cage
	Cassette	Shimano LX	8 speed
	Chain	Shimano IG70	
Wheelset	Hub, rear	Shimano LX	Compact HyperGlide cassette, 135 mm O.L.D.
	front	Fisher Ginzu Pro	17 mm alloy suspension axle, 6 mm skewer
	Rims	Bontrager BCX Blue/Red or Mavic 221	
	Tires	Tioga Psycho-K/T	26 x 1.95, racing tread, Kevlar bead
	Tubes	Presta	
	Spokes	DT or Union Stainless	32 front and rear
Weight		Front	270 15ga.
Color		Rear- D/ND	268/269 15ga.
		24.6 lbs.	11.2 kg
		Polished	

## Geometry and Fit

Sizes	14	16	17.5	19.5
Standover height	721	759	785	821
	28.4	29.9	30.9	32.3
Effective top tube	554	568	583	597
	21.8	22.4	23.0	23.5
Reach	646	673	702	729
	25.4	26.5	27.6	28.7
Head tube length	90	105	125	145
Handlebars 25.4mm	560	560	560	560
Stem, 41 mm clamp ht.	105	120	135	150
	10	10	10	10
Seatpost 27.2mm	300	350	350	350
Crank Length	170	175	175	175
Fork Length	164	176	196	219
Trail	38	38	38	38
Head angle	74	74	74	74
Seat angle	71	71.5	71.5	71.5
Wheelbase	74	74	73.5	73.5
	1028	1040	1051	1065
Chainstay length	40.5	40.9	41.4	41.9
	420	420	420	420
Bottom bracket height	16.5	16.5	16.5	16.5
	290	295	295	295
	11.4	11.6	11.6	11.6

## Mt. Tam Notes

The Mt. Tam shares the high end Gary Fisher aluminum short butted frame, but with a distinctive polished aluminum look. With a Rock Shox Judy XC suspension fork and the new Shimano RapidFire SL shifters, the Mt. Tam rides as well as it looks. In fact, all that shiny aluminum looks so good we thought we'd better dress up the parts, so we added Bontrager's Red/Blue rim combination and a Fisher Ginzu Pro front hub. And a such luxury deserves a fine leather saddle cover.

### Upgrades from the Paragon

Rock Shox Judy XC suspension fork	Hi-Density foam grips
Shimano LX shifters and cranks	Fisher Ginzu Pro front suspension hub
Leather saddle cover	Polished frame
Bontrager Red/Blue rims or Mavic 221	

Our Price: \$

# Supercaliber

## General Specs

Frameset	Frame	Easton	Short butted 6061 T6 aluminum
	Fork	Manitou Mach 5 SX	MCU elastomers with adjustable rebound damping
	Headset	Tange Seiki DL-2	25.4/34.0/30.0, 25.8 mm stack height
Controls	Handlebars	Bontrager Ti	
	Bar ends	Fisher FishFins	
	Stem	Alloy	Ahead
	Shifters	Shimano XT	
	Brake levers	Shimano XT	W/reach adjusters
	Grips	Fisher Hex	High density foam
Saddle		Bontrager Ti	Leather cover
	Seatpost	Bontrager Race Lite	Aluminum
	Seat binder	Fisher Aluminum	35 mm clamp w/integral bolt
Brakes		Shimano XT V Brakes	
Drivetrain	Crankset	Shimano XT	58/94 mm bolt hole circle
	BB	Shimano BB-UN72	73/113
	Pedals	Shimano M535 SPD	Clipless, w/float
	F. derailleur	Shimano XT	Top Swing, top pull, 34.9 mm / 1 3/8"
	R. derailleur	Shimano XT SGS	Long cage
	Cassette	Shimano LX	8 speed
	Chain	Shimano IG90	
Wheelset	Hub, rear	Shimano XT	Compact HyperGlide cassette, 135 mm O.L.D.
	front	Fisher Ginzu Pro	17 mm alloy suspension axle, 6 mm skewer
	Rims	Bontrager BCX Blue/Red or Mavic 221	
	Tires	Tioga Psycho-K/T	26 x 1.95, racing tread, Kevlar bead
	Tubes	Presta	Superlite
	Spokes	DT or Wheelsmith Stainless	Double butted, alloy nipples, 32 front and rear
Weight		Front	270 15/16ga.
Color		Rear- D/ND	268/269 15/16ga.
		23.8 lbs.	10.8 kg
		Matte Red	

## Geometry and Fit

Sizes	14	16	17.5	19.5
Standover height	721	759	785	821
	28.4	29.9	30.9	32.3
Effective top tube	554	568	583	597
	21.8	22.4	23.0	23.5
Reach	646	673	702	729
	25.4	26.5	27.6	28.7
Head tube length	90	105	125	145
Handlebars 25.4mm	560	560	560	560
Stem, 41 mm clamp ht.	105	120	135	150
	10	10	10	10
Seatpost 27.2mm	300	350	350	350
Crank Length	170	175	175	175
Fork Length	161	176	196	216
Trail	38	38	38	38
Head angle	74	74	74	74
Seat angle	71	71.5	71.5	71.5
Wheelbase	74	74	73.5	73.5
	1028	1040	1051	1065
Chainstay length	40.5	40.9	41.4	41.9
	420	420	420	420
Bottom bracket height	16.5	16.5	16.5	16.5
	290	295	295	295
	11.4	11.6	11.6	11.6

## Supercaliber Notes

The Supercaliber is our top of the line aluminum model. So when we spec'd it, we let out the stops. It has so many cool features, your customer will be hard pressed to make it any cooler.

### Upgrades from the Mt. Tam

Mach 5 SX suspension fork	Shimano XT V Brakes
Tange Seiki DL-2 Aheadset	Bontrager Ti handlebars and saddle
DT or Wheelsmith 15/16 butted spokes w/alloy nipples	XT shifters, rear hub, and front derailleur
XT cranks, BB-UN72 bottom bracket, and IG90 chain	

# Space Age Bikes: OCLV

Gary Fisher and Greg LeMond OCLV bikes are built in the U.S. by a manufacturer with a proven track record, starting in 1986, of manufacturing carbon fiber bicycles. A lot of R&D goes to make sure that Gary Fisher and Greg LeMond bikes get the best carbon composite possible.

Composite means you have two or more visibly different components made into a single material with the best attributes of both components. In this case, the two components are the carbon fibers and a matrix of epoxy holding the fibers in place.

A carbon fiber is a long strand of carbon molecules which looks something like a black hair. There are a lot of ways you can get the carbon molecules to join together with different results, like higher modulus, or stiffness. There are also different kinds of carbon fibers, and different materials used to bind the fibers into a composite.

With the material used for OCLV bikes, the matrix is mostly a thermoset epoxy, with a toughener mixed in. This blend has the lowest weight, and highest strength and stiffness available. Other composites used in bikes today include fiberglass/carbon fiber mix in thermoset, or carbon fiber with thermoplastic matrix. The biggest difference in all these different composite materials and their uses is how the carbon fibers are oriented, and how close together they are. This has a lot to do with the end results of stiffness, strength, and weight, and that's what sets OCLV out in front of the pack.

Optimum Compaction means that the carbon fibers are compressed just the right amount in the epoxy for the best strength possible. If you have too much or too little epoxy, you don't get full strength out of the composite. Low Void is an engineering term meaning that less than 2% of the composite is voids. Voids are any inconsistencies in the composite, like air bubbles or epoxy pockets. Again, Any voids would mean lowered strength. The process used in OCLV bikes commonly gets in under 1%, which is better than aircraft specifications.

The OCLV process benefits the bike structure in several ways. If you maximize the strength and stiffness of a material, you can use less of it, and produce a lighter structure with the strength and stiffness you need. The real key to these incredible bikes is the control over the fibers in the matrix resulting from the OCLV process.

With a round, cylindrical tube, its fairly easy to control the fiber orientation and compaction. The fibers can be placed on a mandrel, or steel cylinder, and then pressed tightly in place from the outside. After curing, you can pull the mandrel out from the tube. But you can't do that with a complex shape like a lug. That's the secret of the OCLV process; it allows us to place the fibers right where they are supposed to be in a lug with a complex shape.

Some people criticize the use of lugs with carbon fiber saying bikes with lugs are weak. If the lug and tube only touched at their ends, that would be true. But OCLV bikes have highly-engineered lugs and tubes with a precision tapered overlapping design with a very large bond area, plus the lugs are designed so that the stress is spread over a large area, and away from the highest stress areas found near the tubing joints of a bike.

As for the criticism that the glue in the bond is inherently weak, you have to remember that in carbon fiber composite, the material ITSELF is glued together. As long as the bond is of the same precision as the parts you are bonding, there is no weak point.

That explains why OCLV frames are the lightest around, yet fully capable of hard core racing. Gary's OCLV mountain frames weigh a mere 2.92 pounds, while Greg's road frames tip the scales at a feathery 2.50 pounds.

## Always Improving

Every year, we tweak and tune. In 1995, we answered your requests to use internal threaded water bottle mounts, while satisfying our need for complete structural integrity of the frame. Along with that, we changed to top tube routed cables to avoid mud buildup and cable friction. We also tuned the tube set a bit. We've added a bit more bottom bracket rigidity through the use of filament wound tubing which has more torsional strength.

For 1996 we have slightly redesigned the bottom bracket lugs making them more durable while adding some mud clearance on the mountain bikes.

Also for '96, we have introduced a new smaller 13.5" size of mountain bike to fit smaller people. And to make the size range work better, we shortened the top tube of the 14.75" size slightly.

Our Price: \$\_\_\_\_\_

## General Specs

Frameset	Frame	OCLV	Carbon composite
	Fork	Rock Shox Judy XC	MCU elastomer w/adjustable compression damping
	Headset	Tange Seiki DL-2	25.4/34.0/30.0, 25.8 mm stack height
Controls	Handlebars	Bontrager Ti	Butted
	Bar ends	Fisher FishFins	
	Stem	Alloy	Ahead
	Shifters	Shimano XT	
	Brake levers	Shimano XT	
	Grips	Fisher Hex	High density foam
Saddle		Bontrager	Hollow Cro-Moly rails, leather cover
	Seatpost	Bontrager Race Lite	Aluminum
	Seat binder	Fisher OCLV	35 mm clamp w/ integral bolt
Brakes		Shimano XT V Brakes	
Drivetrain	Crankset	Shimano LX	58/94 mm bolt hole circle
	BB	Shimano BB-UN52	73/113
	Pedals	Shimano M535 SPD	Clipless, w/float
	F. derailleur	Shimano LX	Top pull, 34.9 mm / 1 <sup>3/8</sup> "
	R. derailleur	Shimano XT SGS	Long cage
	Cassette	Shimano LX	8 speed
	Chain	Shimano IG70	
Wheelset	Hub, rear	Shimano LX	Compact HyperGlide cassette, 135 mm O.L.D.
	front	Fisher Ginzu Pro	17 mm aluminum suspension axle, 6 mm skewer
	Rims	Bontrager BCX Blue/Red or	Mavic 221
	Tires	Tioga Psycho-K/T	26 x 1.95, Kevlar bead
	Tubes	Presta	Superlite
	Spokes	DT or Union Stainless	Alloy nipples, 32 front and rear
		Front	270 15ga.
		Rear- D/ND	268/269 15ga.
Weight		23.1 lbs.	10.5 kg
Color		Moss Green	

	22	32	42
11	--	76	100
12	48	70	92
14	41	60	79
16	36	52	69
18	32	47	61
21	27	40	52
24	24	35	46
28	21	30	--

## Geometry and Fit

Sizes	13.5	14.75	16.25	17.75	19.25
Standover height	720	735	741	764	799
	28.3	28.9	29.2	30.1	31.5
Effective top tube	554	565	590	595	600
	21.8	22.2	23.2	23.4	23.6
Reach	636	656	695	714	732
	25.0	25.8	27.4	28.1	28.8
Head tube length	110	110	110	123	159
Handlebars	25.4 mm	560	560	560	560
Stem, 41 mm clamp ht.	90	105	120	135	150
	5	10	10	10	10
Seatpost	27.2 mm	300	300	350	350
Cranks		170	172.5	175	177.5
Fork		184	184	197	233
		38	38	38	38
Trail		79	79	77	77
Head angle		70.5	70.5	71	71.5
Seat angle		73	73	73	73
Wheelbase		1029	1040	1060	1065
		40.5	40.9	41.7	41.9
Chainstay length		424	424	424	424
		16.7	16.7	16.7	16.7
Bottom bracket height		298	298	298	298
		11.7	11.7	11.7	11.7

## Procaliber Notes

The OCLV frame on the Procaliber is the lightest production mountain bike frame in the world at just 2.92 pounds. Even though its so light, its still plenty stiff to give great handling and excellent power transfer. Although our Supercaliber has some higher level parts on it, the Procaliber has the more high tech frame.

## Upgrades from the Supercaliber

OCLV frame



Procaliber Ltd. Our Price: \$\_\_\_\_\_

General Specs

Frameset	Frame	OCV	Carbon composite
	Fork	Rock Shox Judy SL	MCU elastomer w/adjustable compression damping
Controls	Headset	Tange Seiki/WTB	25.4/34.0/30.0, 27.0 mm stack height
	Handlebars	Bontrager Ti	Butted
	Bar ends	Bontrager Magnesium	
	Stem	Bontrager or Control Tech Aluminum Ahead	
	Shifters	GripShift SRT-900 ESP	
Saddle	Brake levers	Shimano XT	V Brakes
	Grips	Kraton	
	Seatpost	Bontrager Ti	Leather cover
Brakes	Seat binder	Synchros Ti	35 mm clamp w/ integral bolt
		Fisher OCLV	
Drivetrain	Crankset	Shimano XT V Brakes	
	BB	White Industries	SS3 chainrings, 58/94 mm bolt hole circle
	Pedals	White Industries Ti	73/114
	F.derailleur	Shimano M747 SPD	Clipless, w/float
	R.derailleur	Shimano XT	Top pull, 34.9 mm / 1 3/8"
	Cassette	GripShift ESP-900	Long cage
	Chain	Shimano XT	8 speed
Wheelset	Hub, rear	Shimano IG90	
	front	White Industries	Compact HyperGlide cassette, 135 mm O.L.D.
	Rims	White Industries Tracker	17 mm aluminum suspension axle, 6 mm skewer
	Tires	Mavic 217 SUP	
	Spokes	Tioga Psycho-LTD/T	26 x 1.95, SLX casing, Kevlar bead
Weight		Presta	Superlite
		Wheelsmith	Stainless, double butted, alloy nipples, 32 front and rear
		Front	263 15/16ga.
Color		Rear- D/ND	259/261 15/16ga.
		21.9 lbs.	9.9 kg
		Matte Violet	

Geometry and Fit

Sizes	13.5	14.75	16.25	17.75	19.25	
Standover height	720	735	741	764	799	20 32 44
Effective top tube	28.3	28.9	29.2	30.1	31.5	11 -- 76 105
	554	565	590	595	600	12 44 70 96
Reach	21.8	22.2	23.2	23.4	23.6	14 37 60 82
	636	656	695	714	732	16 33 52 72
Head tube length	25.0	25.8	27.4	28.1	28.8	18 29 47 64
	110	110	110	123	159	21 25 40 55
Handlebars 25.4mm	560	560	560	560	560	24 22 35 48
Stem, 41 mm clamp ht.	90	105	120	135	150	28 19 30 --
Seatpost 27.2mm	5	10	10	10	10	
	300	300	350	350	350	
Cranks	170	172.5	175	175	177.5	
Fork	184	184	184	197	233	
Trail	38	38	38	38	38	
	79	79	77	77	77	
Head angle	70.5	70.5	71	71.5	71.5	
Seat angle	73	73	73	73	73	
Wheelbase	1029	1040	1060	1065	1070	
Chainstay length	40.5	40.9	41.7	41.9	42.1	
	424	424	424	424	424	
Bottom bracket height	16.7	16.7	16.7	16.7	16.7	
	298	298	298	298	298	
	11.7	11.7	11.7	11.7	11.7	

Procaliber Ltd. Notes

This is Gary's ultimate ride. When cost is no obstacle, and only the best will do, get a Procaliber Ltd.

Upgrades from the Procaliber

Judy SL suspension fork	Tange Seiki WTB Grease Guard Aheadset
White Industries cranks w/Ti bottom bracket	GripShift ESP 900 shifters and rear derailleur
Italian Bontrager Ti saddle	Shimano M747 SPD clipless pedals
White Industries hubs w/custom front hub and	Fisher 6 mm skewer
Psycho LTD tires	Mavic 217 SUP rims
	DT or Wheelsmith 15/16 stainless spokes

Fisher Full Suspension

Why full suspension?

Gary has ridden full suspension for along time, first working with Mert Lawill on the Fisher RS1. Suspension adds comfort to cycling. And that comfort means you can go faster, farther, and on more difficult terrain.

Doesn't full suspension have a lot of problems?

Like everything in bike design, there is a trade-off for the advantages of suspension. Weight, complexity, maintenance, adjustment, and efficiency are all considerations. With a good design like the Joshua, the weight penalty of full suspension is small enough that a Joshua can be the full time bike for lots of different riders, from bike path cruisers to NORBA racers.

Although it took some sophisticated engineering work, the Joshua's Unified Rear Triangle is pretty simple in that there is only one pivot to maintain. To compliment Gary's suspension design, he has chosen several models of rear shocks that highlight different levels of full suspension performance- whether a rider's goal is comfort, efficiency, or speed. And although some folks might complain that an active suspension bike will bob if you pedal squares, the overall picture is that you gain efficiency.

So how much bobbing is there?

A really plush fully active bike like the Joshua will move if you bounce on it, both front and rear. You must bear in mind that if a bike is to react to a small force under the suspension, it will also react to a small force over the suspension. The flip side is that the bike reacts to every little bump, keeping the tires on the ground and giving you incredible traction. But correct adjustment of the suspension and good pedaling technique with a round stroke will go a long ways to minimize any negative effect from the suspension.

Another detail missed by some is that the rear suspension is affected by the front suspension. If the fork allows your body to move downwards, the accelerated mass of your body will create additional force, and an active rear suspension will react to this force. A plush fork can definitely make the bike move up and down more. So if you set the bike up carefully for a test ride, you won't get much bobbing. But we like ours set up pretty soft, in which case you can get a lot of bobbing if you are bouncing on the bike by throwing yourself at the pedals.

Are both climbing and stopping traction improved?

Yes. Since the Joshua's design allows the wheels to follow the terrain better, the tires always maintain better contact with the ground. So all traction is improved. Even cornering. Combine the added traction with the Joshua's lateral rigidity, and this bike corners like it's on rails.

You mentioned lateral rigidity. How stiff is it?

The new Joshua bikes are about 15% stiffer torsionally than a Procaliber, and about 8% laterally.

Wow. That's awesome, because the Procaliber plenty stiff for most folks. How about weight?

Well, you still have a weight penalty, but its not too bad. The top of the line Joshua Z goes at about 25.5 pounds, compared to around 23 pounds for a Procaliber.

They aren't really all that expensive. What's the down side?

A plush, fully active suspension is just that. Plush and active. If a rider gets on expecting it to feel like a rigid bike, or even a suspended hardtail, they'll miss what this bike is all about. What we've found is that the more we ride suspension, the softer we seem to like it. Under normal pedaling there is not a lot of motion that you can feel. You can see the shocks moving, though. When you get out of the saddle and sprint, the bike can move up and down, especially if the fork is set-up really soft. Most of the movement is the fork, and for this reason you may want to send your demos out with the fork at full damping, and somewhat high spring preload. After the rider gets used to an active feel, they can soften it up.

Of course, with the new Stratos rear shock on the Joshua Z, you can have it both ways. Plush and active, or locked out and rigid for efficiency in hard sprints and smooth climbs.

So mostly its just adjustment. How much air in the rear shock?

With the Stratos, your body weight in PSI, plus about 50% is a good starting point. Later, most folks will ride it on the softer side. But the best rule of thumb for any rear shock on the Joshuas is to look for about 2-4 mm compression of the shock when you sit on the bike. This works for air/oil as well as coil/over shocks like the Rock Shox.

How much travel do you actually get?

4 inches in the back, and 3 in the front with the long travel Judys, or 2.35 inches with a Quadra 21R.

So how do you describe this design?

Its a "Unified Rear Triangle" because the rear dropouts, the bottom bracket, the seat and chainstays, and the "seat tube" are all joined in a triangle. With this design, the bottom bracket and rear wheel cannot move toward or apart from one another, so there is no chain or pedal feedback. Its what makes the action of the rear end so supple.

Some other Unified Rear Triangles have really different pivot locations. Why is that?

The pivot of the Joshuas was located to minimize torsional flex, and to keep the bottom bracket and seat at the same distance. Otherwise, hitting a bump will make your seat feel like its moving up and down, although actually its the bottom bracket which moves. But having the seat move up and down can make it

Our Price: \$ \_\_\_\_\_

## General Specs

Frameset	Frame	6061 T6 aluminum	Oval cross section, Side butted
	Rear shock	Rock Shox Deluxe	Coil/over
	Fork	Rock Shox Quadra 21R	Micro-cellular urethane elastomer suspension
	Headset	Dia-Compe ST-2	25.4/ 34.0/ 30.0, 33.4 mm stack height
Controls	Handlebars	Aluminum alloy	
	Bar ends	Fisher Fishsticks	
	Stem	Aluminum	Ahead
	Shifters	GripShift SRT-400	
	Brake levers	Dia-Compe PC-7N	W/reach adjusters
	Grips	Kraton	
Saddle	Seatpost	Bontrager Plus 10	Micro-adjust
	Seat binder	Aluminum	34.9 mm clamp w/ integral bolt
Brakes		Fisher Aluminum	
Drivetrain	Crankset	Shimano Alivio	SS3 chainrings, 58/94 mm bolt hole circle
	BB	Sugino Impel 300	73/113
	Pedals	Shimano BB-LP26	Steel cage, clips and straps
	F. derailleur	Resin	Top pull, 34.9 mm / 1 <sup>3/8</sup> "
	R. derailleur	Shimano LX	Long cage
	Cassette	Shimano LX SGS	7 speed
	Chain	Shimano STX	
	Hub, rear	Shimano IG31	Compact HyperGlide cassette, 135 mm O.L.D.
Wheelset	Front	Shimano Alivio	12 mm Cro-Moly suspension axle, 6 mm skewer
	Rims	Fisher Ginzu Team	
	Tires	Matrix Lobo	
	Tubes	Tioga Psycho KS/TS	26 x 1.95
	Spokes	Presta	
		DT or Union Stainless	32 front and rear
		Front	269 15ga.
		Rear-D/ND	267/268 15ga.
		26.5 lbs.	12.0 kg
Weight		Matte P.C. Green	
Color			

## Geometry and Fit

Sizes	S	M	L
Effective top tube	550	580	610
	21.7	22.8	24.0
Standover height	678	668	662
	26.7	26.3	26.1
Reach	632	697	740
	24.9	27.4	29.1
Head tube length	125	125	145
Handlebar	25.4 mm	560	560
Stem, 41 mm clamp ht.	90	135	150
	5	10	10
Seatpost	27.2 mm	300	350
Cranks	170	175	175
	M	L	L
Fork	198	198	218
	42	42	42
Trail	70	73	73
Head angle	71	70.5	70.5
Seat angle	74	73.5	73.5
Wheelbase	1043	1074	1104
	41.1	42.3	43.5
Chainstay length	430	430	430
	16.9	16.9	16.9
Bottom bracket height - with no sag	311	311	311
	12.2	12.2	12.2

## Joshua X Notes

Although this Joshua is pretty affordable as full suspension bikes go, we didn't cut corners in suspension performance to get here. The 'X' offers a full 4 inches of usable travel, durable and low maintenance pivot with lots of rigidity, and overall low weight. Sticking with our feelings about suspension performance, we even spec'd an expensive Fisher Ginzu Team front hub with 6 mm skewer on this bike to add steering control.

hard for you to pedal. This defeats the purpose of having an active suspension.

Also, some URT designs are meant to "lock out" when you stand, while our goal was to keep the suspension active all the time. With these other designs, in order for the rear wheel to get over a bump, it has to lift the bottom bracket the same amount as the distance change from saddle to bottom bracket we were just discussing around; 1.5 inches, depending on the design. Since our pivot is located almost directly above the bottom bracket, the rear wheel doesn't really have to lift you during its movement over a bump. With a Joshua, if the rear wheel moves up 4", the bottom bracket only has to lift 1/4". No lifting, no lockout.

### How much does the Joshua bottom bracket move?

If you fully compress all four inches at the wheel, the bottom bracket will move up about 1/4 inch, and back only about 3/4 inch. Since it would be hard to stay seated and pedal through such a hard bump, you can't feel this small amount of motion. After all, your saddle would compress more than 1/4 inch if you stayed seated through 4" of suspension movement.

### How does this pivot location minimize flex?

Think of it this way. The longer the wrench, the more you can twist a bolt or nut, right? Well, the further the pivot is away from a straight line between the bottom bracket and the head tube, the more torque you can apply to the pivot, causing more torsional flex. You want to prevent torsional flex so the wheels track true and the bike handles better.

In addition, the further forward on the bike you move the pivot, the greater the chances that a front wheel impact would activate the rear shock. We placed the Joshua bike pivot so that it has fully independent suspension.

### What about the pivot, anyway?

Its an electroless Nickel plated aluminum axle riding on a Teflon impregnated composite bearing.

### Sounds cool! What's special about it?

Its maintenance free. You don't even have to lube it. In fact, you shouldn't because some lubes may damage the Teflon lubrication in the bearing. Just wash the pivot area with a little soap and water.

## Fitting the Joshua bikes

With the Joshua bike frame, its hard to even say it has a top tube, but we'll use the term for discussion's sake. With the dropped top tube design of the Joshua the correct frame size offers way more standover than usual for most mountain bikes.

Since there's less than one inch variance in the standover for all three frame sizes, most riders will find they can straddle all three sizes. Choose the bike with the rider's preference for reach and handlebar height, and make sure that the rider's seat post adjustment leaves at least one inch of clearance over the top of the shock. The seatpost can be raised to its normal full length, to the highest point where the Minimum Insertion mark is still in the frame.

## Selling the Joshua Bikes

With any suspension bike it will help a great deal to set the bike up properly for a test ride. We recommend that you try the following 2 Step procedure for your own test ride, then follow it with your customers with your own modifications as desired.

For a first ride we recommend setting the bike up with no sag in the rear shock and set the fork up at its stiffest setting. This is a firm setting. As you set the bike up firm, explain to the customer that the bike can easily be set up softer as they get used to it, and that you will have them try that, too.

After this initial test ride soften the bike up so that there is 2-4 mm of sag measured at the rear shock with the rider in the saddle, and 5-10 mm in the fork. Then ride the bike again.

We find that some folks like the fork set at full soft. In any case, you won't want more than 2-4 mm of sag at the rear shock as this may cause the bottom bracket to be too low.

Here's how to show your customer the difference between our pivot location and that of other URT bikes:

Place the eraser end of a pencil on the counter to represent the pivot on the bike. We'll have the other end represent the rear wheel. Have your customer move this end of the pencil up and down to illustrate the wheel moving over a big bump.

With the Joshua pivot, the bottom bracket is roughly 1/80th of the way from the pivot to the rear axle. Place your finger about 1/4" from the eraser and push down on the pencil while the customer "moves the wheel over a bump". Point out that your finger pressure does little to resist the wheel movement, while it also does not move up and down much during wheel travel.

With other designs, the bottom bracket is located about 1/4 of the way from the pivot to the rear wheel. To demonstrate what this means, place your finger about 1 to 1.5 inches from the 'pivot' and have your customer 'move the wheel'. Your finger can now prevent the 'wheel' from moving, and when the wheel moves, your finger will be moving up and down considerably.

Joshua Y
General Specs

Table with 3 columns: Component, Specification, and Price. Rows include Frameset, Controls, Saddle, Brakes, Drivetrain, Wheelset, Weight, and Color.

Geometry and Fit

Table with 3 columns: Component, Specification, and Price. Rows include Sizes, Standover height, Reach, Head tube length, Handlebar, Stem, Seatpost, Cranks, Fork, Trail, Head angle, Seat angle, Wheelbase, Chainstay length, and Bottom bracket height.

Joshua Y Notes

The Joshua Y has the features required for hard core suspension riding; a 3" travel fork with adjustable damping, and 4" of rear wheel travel using a coil/over rear shock which also has adjustable damping.

Upgrades from the Joshua X

Table with 2 columns: Upgrade Item and Price. Rows include Rock Shox Judy XC-Long travel suspension fork, Bontrager handlebars, seatpost, and BCX-1 rims, GripShift SRT-800 shifters w/Shimano LX/XT derailleurs, Sugino Impel 700 cranks, Shimano M535 SPD clipless pedals, Psycho K/T tires with Kevlar beads, Rock Shox Super Deluxe rear shock, Hollow Cro-Moly saddle rails, Fisher FishFins bar ends, and Psycho K/T tires with Kevlar beads.

Joshua Z
General Specs

Table with 3 columns: Component, Specification, and Price. Rows include Frameset, Controls, Saddle, Brakes, Drivetrain, Wheelset, Weight, and Color.

Geometry and Fit

Table with 3 columns: Component, Specification, and Price. Rows include Sizes, Standover height, Reach, Head tube length, Handlebar, Stem, Seatpost, Cranks, Fork, Trail, Head angle, Seat angle, Wheelbase, Chainstay length, and Bottom bracket height.

Joshua Z Notes

Gary's new suspension bike cuts over 5 pounds from his first try!

Upgrades from the Joshua Y

Table with 2 columns: Upgrade Item and Price. Rows include Rock Shox Judy SL long travel suspension fork, Bontrager Ti handlebars, Shimano XT shifters, front derailleur, rear hub, Fisher Ginzu Pro front suspension hub, Wheelsmith 15/16 spokes with alloy nipples, Stratos air/oil rear shock w/remote damping adjustment, Carbon brake arch, Shimano XT V Brakes, and Bontrager Red/Blue rims.

# Avant Garde

Our Price: \$\_\_\_\_\_

## General Specs

Frameset	Frame	Cro-Moly main tubes	HiTensile stays
	Fork	Cro-Moly	
	Headset	Steel	22.2/30.0/27.0, 33.0 mm stack height
Controls	Handlebars	Steel	30 mm rise
	Stem	Steel	
	Shifters	GripShift MRX-100	
	Brake levers	Alloy	
	Grips	Kraton	
Saddle		Fisher	Supersoft foam
	Seatpost	Aluminum alloy	Micro-adjust
	Seat binder	Kalloy	M6 x 55 quick release
Brakes		Shimano Altus CT91	
Drivetrain	Crankset	Shimano Altus CT91	Riveted
	BB	Shimano BB-CT91	68/118
	Pedals	ATB nylon	
	F. derailleur	Shimano Altus C91	Down pull, 28.6 mm / 1 <sup>1/8"</sup>
	R. derailleur	Shimano Acera-X	
	Cassette	Shimano HG30	7 speed
Wheelset	Chain	KMC UG50	
	Hubs	Alloy QR	Compact HyperGlide cassette, 135 mm O.L.D.
	Rims	Weinmann 519	24 32 38
	Tires	Skinwall	700x35
	Tubes	Schraeder	11 -- 79 94
	Spokes	Chrome plated	13 50 67 80
		Front	15 44 58 69
Weight		Rear- D/ND	18 36 48 58
Color		26.4 lbs.	12.0 kg
		Silver	21 31 42 49
		Matte Aqua	24 27 36 43
			28 23 31 --

## Geometry and Fit

Sizes	13	15	17	19	21	23	15.5W	18.5W
Standover height	702	727	750	781	825	874	681	679
	27.6	28.6	29.5	30.7	32.5	34.4	26.8	26.7
Effective top tube	545	550	560	570	580	590	550	560
	21.5	21.7	22.0	22.4	22.8	23.2	21.7	22.0
Reach	602	621	631	643	667	677	621	633
	23.7	24.4	24.8	25.3	26.3	26.7	24.4	24.9
Head tube length	90	90	90	100	140	157	120	165
Handlebars	25.4 mm	Width	580	580	580	580	580	580
Stem	22.2 mm	Length	80	100	100	120	100	100
		Degrees rise	25	25	25	25	25	25
		Insertion	150	150	150	150	150	150
Seatpost	26.6 mm	Length	300	300	300	300	250	300
Cranks		Length	170	170	170	170	170	170
Fork		Steerer length	123	125	128	138	184	195
		Offset	50	50	50	50	50	50
Trail			73	70	70	63	63	64
Head angle			70	70.5	70.5	71.5	71	70.5
Seat angle			74	74	73	73	72.5	74
Wheelbase			1037	1038	1039	1040	1051	1063
			40.8	40.9	40.9	40.9	41.4	41.9
Chainstay length			430	430	430	430	430	430
			16.9	16.9	16.9	16.9	16.9	16.9
Bottom bracket height			281	281	281	281	281	281
			11.1	11.1	11.1	11.1	11.1	11.1

## Avant Garde Notes

The Avant Garde is a traditional hybrid, Gary Fisher style. Extra Fisher touches include 15 gauge spokes on Weinmann rims for a light and resilient wheelset and a Fisher Supersoft foam saddle for comfort and pedaling efficiency. Gary used Cro-Moly in the frame where the thinner tubing would yield the best ride characteristics, the main triangle and the fork.

# Zebrano

Our Price: \$\_\_\_\_\_

## General Specs

Frameset	Frame	Cro-Moly	
	Fork	Cro-Moly	
	Headset	Steel	22.2/30.0/27.0, 30.9 mm stack height
Controls	Handlebars	Steel	
	Stem	Girvin Flexstem	Steel suspension
	Shifters	GripShift SRT-400	
	Brake levers	Alloy	
	Grips	Kraton	
Saddle		Fisher	"Supersoft" foam
	Seatpost	Aluminum alloy	Micro-adjust
	Seat binder	Fisher Steel	Integral QR
Brakes		Shimano Acera-X	
Drivetrain	Crankset	Shimano Alivio	67 mm bolt hole circle
	BB	Shimano BB-LP26	68/113
	Pedals	Resin	Clips and straps
	F. derailleur	Shimano Acera-X	Down pull, 28.6 mm / 1 <sup>1/8"</sup>
	R. derailleur	Shimano Alivio	
	Cassette	Shimano STX	7 speed
Wheelset	Chain	KMC IG31	
	Hub, rear	Shimano Acera-X	Compact HyperGlide cassette, 135 mm O.L.D.
	front	Alloy	22 32 42
	Rims	Weinmann 519	700x35
	Tires	Tioga City Slicker 2	11 -- 79 104
	Tubes	Presta	13 46 67 88
	Spokes	Stainless	15 40 58 76
		32 front and rear	18 33 48 64
Weight		304 15ga.	11.7 kg
Color		302/303 15ga.	21 29 42 54
		25.8 lbs.	24 25 36 48
		Red	28 21 31 --
		Matte Steel Blue	

## Geometry and Fit

Sizes	13	15	17	19	21	15.5W	18.5W
Standover height	702	727	750	781	825	681	679
	27.6	28.6	29.5	30.7	32.5	26.8	26.7
Effective top tube	545	550	560	570	580	550	560
	21.5	21.7	22.0	22.4	22.8	21.7	22.0
Reach	639	644	668	678	688	644	668
	25.2	25.4	26.3	26.7	27.1	25.4	26.3
Head tube length	90	90	90	100	140	120	165
Handlebars	25.4 mm	Width	560	560	560	560	560
Stem	22.2 mm	Length	115	115	130	130	115
		Degrees rise	10	10	10	10	10
Seatpost	26.6 mm	Length	300	300	350	350	300
Cranks		Length	170	170	175	175	175
		Toe clip size	M	M	M	L	M
Fork		Steerer length	123	123	123	133	173
		Offset	50	50	50	50	50
Trail			73	70	70	63	63
Head angle			70	70.5	70.5	71.5	71.5
Seat angle			74	74	73	73	74
Wheelbase			1037	1038	1039	1040	1051
			40.8	40.9	40.9	40.9	41.4
Chainstay length			430	430	430	430	430
			16.9	16.9	16.9	16.9	16.9
Bottom bracket height			281	281	281	281	281
			11.1	11.1	11.1	11.1	11.1

## Zebrano Notes

The Zebrano has a unique feature, the Girvin Flexstem. Shock absorption at the handlebars makes this a traditional hybrid with extra comfort features. Along with this more performance ride you get other Fisher touches as well, most notably the Fisher Spoon quick release lever on the seatpost.

### Upgrades from the Avant Garde

Full Cro-Moly frame	Girvin Flexstem	GripShift SRT-400 shifters
Fisher Spoon seatpost QR	Shimano Acera-X brakes	Alivio cranks with wider gearing
Acera-X front derailleur	Alivio rear derailleur	Stainless spokes
Resin pedals with clips and straps		



# Alfresco

## General Specs

Frameset	Frame	Cro-Moly	Double butted				
	Fork	Cro-Moly					
	Headset	Alloy	22.2/30.2/26.4, 30.9 mm stack height				
Controls	Handlebars	Aluminum alloy					
	Bar ends	Fisher Fishsticks					
	Stem	Girvin FlexStem	Alloy suspension				
	Shifters	GripShift SRT-400					
	Brake levers	Alloy					
	Grips	Kraton					
Saddle		Fisher	"Supersoft" foam				
	Seatpost	Aluminum alloy	Micro-adjust				
	Seat binder	Fisher Steel	Integral QR				
Brakes		Shimano Alivio					
Drivetrain	Crankset	Sugino Impel 300	58/94 mm bolt hole circle				
	BB	Shimano BB-LP26	68/110				
	Pedals	Resin	Steel cage, clips and straps				
	F. derailleur	Shimano STX	Top Swing, down pull, 28.6 mm / 1 <sup>1</sup> / <sub>8</sub> "				
	R. derailleur	Shimano STX SGS	Long cage				
	Cassette	Shimano STX	7 speed				
	Chain	Shimano IG31					
Wheelset	Hub, rear	Shimano Alivio	Compact HyperGlide cassette, 135 mm O.L.D.				
	front	Alloy	Oversize axle	20	32	42	
	Rims	Weinmann ZAC 19		11	--	79	104
	Tires	Tioga City Slicker 2	700x35	13	42	67	88
	Tubes	Presta		15	36	58	76
	Spokes	Stainless	32 front and rear	18	30	48	64
		Front	296 15ga.	21	26	42	54
Weight		Rear- D/ND	294/295 15ga.	24	23	36	48
Color		25.9 lbs.	11.8 kg	28	19	31	--
		Ballistic Blue					

## Geometry and Fit

Sizes	13	15	17	19	21	15.5W	18.5W
Standover height	702	727	750	781	825	681	679
	27.6	28.6	29.5	30.7	32.5	26.8	26.7
Effective top tube	545	550	560	570	580	550	560
	21.5	21.7	22.0	22.4	22.8	21.7	22.0
Reach	641	646	664	675	689	646	664
	25.2	25.4	26.1	26.6	27.1	25.4	26.1
Head tube length	90	90	90	100	140	120	165
Handlebars	25.4 mm	Width	560	560	560	560	560
Stem	22.2 mm	Length	110	110	120	135	110
		Degrees rise	10	10	10	10	10
Seatpost	27.2 mm	Length	300	300	350	350	300
Cranks		Length	170	170	175	175	175
		Toe clip size	M	M	L	L	M
Fork		Steerer length	123	123	133	173	153
		Offset	50	50	50	50	50
Trail			73	70	70	63	70
Head angle			70	70.5	70.5	71.5	70.5
Seat angle			74	74	73	73	74
Wheelbase			1037	1038	1039	1040	1051
			40.8	40.9	40.9	41.4	40.9
Chainstay length			430	430	430	430	430
			16.9	16.9	16.9	16.9	16.9
Bottom bracket height			281	281	281	281	281
			11.1	11.1	11.1	11.1	11.1

## Alfresco Notes

The Alfresco is the connoisseur's hybrid. A double butted Cro-Moly frame coupled with an aluminum Girvin Flexstem puts it in a class of its own. And although it may be a super deluxe city bike, its bar ends make the Alfresco ready for some longer miles, too.

### Upgrades from the Zebrano

Double butted Cro-Moly  
Alivio brakes  
Alivio rear hub

Aluminum Flexstem  
Sugino Impel 300 cranks  
Weinmann ZAC 19 rims

Fisher Fishsticks bar ends  
STX derailleurs, cassette, and chain

Our Price: \$

Our Price: \$

# Klunker

## General Specs

Frameset	Frame	Cro-Moly					
	Fork	Cro-Moly					
	Headset	Steel	22.2/30.2/26.4, 30.0 mm stack height				
Controls	Handlebars	Aluminum alloy	Retro bend				
	Stem	Alloy	Forged				
	Shifters	Shimano STX					
	Brake levers	Shimano STX					
	Grips	Fisher Hex	High density foam				
Saddle		Brooks B-17	Leather w/springs				
	Seatpost	Aluminum alloy	Microadjust w/clamp for double rail				
	Seat binder	Kalloy	M6 x 55 QR				
Brakes		Shimano Acera-X					
Drivetrain	Crankset	Shimano STX	58/94 mm bolt hole circle				
	BB	Shimano BB-LP26	68x110				
	Pedals	Alloy	Cro-Moly axles				
	F. derailleur	Shimano STX	Top Swing, down pull, 28.6 mm / 1 <sup>1</sup> / <sub>8</sub> "				
	R. derailleur	Shimano STX SGS	Long cage				
	Cassette	Shimano STX	7 speed				
	Chain	KMC IG31					
Wheelset	Hubs	Shimano STX	Compact HyperGlide cassette, 135 mm O.L.D.				
	Rims	Femco	Alloy	22	32	42	
	Tires	Duro Knobby	26 x 2.1	11	--	76	100
	Tubes	Schraeder	36 front and rear	13	44	65	85
	Spokes	Stainless	264 14ga.	15	38	56	73
		Front	262/263 14ga.	18	32	47	61
Weight		Rear- D/ND	30.8 lbs.	21	27	40	52
Color		Nickel	13.9 kg	24	24	35	46
				28	21	30	--

## Geometry and Fit

Size			16.5
Standover height			766
			30.2
Effective top tube			597
			23.5
Reach			663
			26.1
Head tube length			120
Handlebars	25.4 mm	Width	630
Stem	22.2 mm	Length	140
		Degrees rise	40
Seatpost	26.6 mm	Length	400
Cranks		Length	175
Fork		Steerer length	162
		Offset	64
Trail			66
Head angle			68
Seat angle			69
Wheelbase			1140
			44.9
Chainstay length			477
			18.8
Bottom bracket height			303
			11.9

## Klunker Notes

This is a replica of Gary's original mountain bike, but updated with modern components. Between the lighter parts and the full Cro-Moly frame, this new Klunker is about 10 pound sligher than Gary's original.

By carefully combing a low standover height, a long seatpost, and the long, swept back bars on a conventional type stem, the Klunker is designed to be a one-size-fits-all bike. Try it for yourself, and see!

Although mountain bikes have changed a lot since 1974, in some ways they are very similar. And the Klunker is still a lot of fun to ride. Friends saw Gary riding his personal 1996 Gary Fisher Klunker at Fat Tire festivals on both coasts during the fall of '95, and he even entered a cross country race on it. He says he smoked everyone on the downhill!

# Nirvana

## General Specs

Frameset	Frame	6061 T6 aluminum			
	Fork	Cro-Moly			
	Headset	Tange Seiki Passage	25.4/34.0/30.0, 33.4 mm stack height		
Controls	Handlebars	Aluminum	"Arc"		
	Stem	Cro-Moly	Alloy wedge		
	Shifters	GripShift SRT-400			
	Brake levers	Dia-Compe PC-7N	w/reach adjusters		
	Grips	Kraton			
Saddle		Bontrager Plus 10			
	Seatpost	Aluminum alloy	Micro-adjust		
	Seat binder	Fisher Aluminum	Integral QR		
Brakes		Shimano Alivio			
Drivetrain	Crankset	Sugino Fuse Comp	58/94 mm bolt hole circle		
	BB	Shimano BB-LP26	73/113		
	Pedals	Resin	Steel cage, clips and straps		
	F. derailleur	Shimano STX	Top pull, 34.9 mm / 1 <sup>3</sup> / <sub>8</sub> "		
	R. derailleur	Shimano STX SGS	Long cage		
	Cassette	Shimano STX	7 speed		
	Chain	Shimano IG31			
Wheelset	Hub, rear	Shimano Alivio	Compact HyperGlide cassette, 135 mm O.L.D.		
	front	Alloy	Oversize axle	26 36 46	
	Rims	Matrix Lobo		11	-- 86 110
	Tires	Tioga City Slicker 2	26 x 1.5	13	52 73 93
	Tubes	Presta		15	45 63 80
	Spokes	DT or Union Stainless	32 front and rear	18	38 52 67
		Front	269 15ga.	21	32 45 57
		Rear- D/ND	267/268 15ga.	24	28 39 50
Weight		24.6 lbs.	11.2 kg	28	24 34 --
Color		Slate			

## Geometry and Fit

Sizes	14	16	17.5	19.5
Standover height	703	739	767	800
	27.7	29.1	30.2	31.5
Effective top tube	548	564	579	591
	21.6	22.2	22.8	23.3
Reach	642	671	699	725
	25.3	26.4	27.5	28.5
Head tube length	90	105	125	145
Handlebars	25.4 mm	Width	560	560
Stem	25.4 mm	Length	105	120
		Degrees rise	5	10
		Insertion	130	130
Seatpost	27.2 mm	Length	300	350
Cranks		Length	170	175
		Toe clip size	M	M
Fork		Steerer length	128	143
		Offset	45	45
Trail			55	53
Head angle			72.5	73
Seat angle			75	75
Wheelbase			1023	1036
			40.3	40.8
Chainstay length			420	420
			16.5	16.5
Bottom bracket height			279	284
			11.0	11.2

## Nirvana Notes

Call it a hybrid with an attitude. Gary says he was building a shop mechanic's bike, but with all modern parts. However you refer to the Nirvana, you'll find its a blast to scream around town on this bike. Quick handling, and with streetable 26" wheels. Gearing set up for road riding or traffic light sprints. And rugged for the kind of pavement found in the heart of the city.

Our Price: \$\_\_\_\_\_

# Utopia

## General Specs

Frameset	Frame	6061 T6 aluminum			
	Fork	Cro-Moly			
	Headset	Tange Seiki Passage	25.4/34.0/30.0, 33.4 mm stack height		
Controls	Handlebars	Aluminum	"Arc"		
	Stem	Cro-Moly	Alloy wedge		
	Shifters	GripShift SRT-600			
	Brake levers	Dia-Compe PC-7N	w/reach adjusters		
	Grips	Kraton			
Saddle		Bontrager Plus 10			
	Seatpost	Aluminum alloy	Hollow Cro-Moly rails		
	Seat binder	Fisher Aluminum	Micro-adjust		
Brakes		Shimano STX-RC	Integral quick release		
Drivetrain	Crankset	Sugino Fuse Pro	58/94 mm bolt hole circle		
	BB	Shimano BB-LP26	73/113		
	Pedals	Alloy	Clips and straps		
	F. derailleur	Shimano LX	Top pull, 34.9 mm / 1 <sup>3</sup> / <sub>8</sub> "		
	R. derailleur	Shimano LX			
	Cassette	Shimano LX	8 speed		
	Chain	Shimano IG31			
Wheelset	Hub, rear	Shimano LX	Compact HyperGlide cassette, 135 mm O.L.D.		
	front	Fisher Ginzu Team	12 mm Cro-Moly suspension axle, 6 mm skewer		
	Rims	Bontrager BCX Red/Blue or Mavic 221		26 36 46	
	Tires	IRC Smoothie	26x1.25	11	-- 86 110
	Tubes	Presta		12	57 79 101
	Spokes	DT or WheelSmith Stainless	Double butted, 32 front and rear	14	49 67 86
		Front	269 15/16ga.	16	43 59 75
		Rear- D/ND	267/268 15/16ga.	18	38 52 67
Weight		23.9 lbs.	10.9 kg	21	32 45 57
Color		Moss Green		24	28 39 50
				28	24 34 --

## Geometry and Fit

Sizes	14	16	17.5	19.5
Standover height	703	739	767	800
	27.7	29.1	30.2	31.5
Effective top tube	548	564	579	591
	21.6	22.2	22.8	23.3
Reach	642	671	699	725
	25.3	26.4	27.5	28.5
Head tube length	90	105	125	145
Handlebars	25.4 mm	Width	560	560
Stem	25.4 mm	Length	105	120
		Degrees rise	5	10
		Insertion	130	130
Seatpost	27.2 mm	Length	300	350
Cranks		Length	170	175
		Toe clip length	M	M
Fork		Steerer length	128	143
		Offset	45	45
Trail			55	53
Head angle			72.5	73
Seat angle			75	75
Wheelbase			1023	1036
			40.3	40.8
Chainstay length			420	420
			16.5	16.5
Bottom bracket height			279	284
			11.0	11.2

## Utopia Notes

The logical step up from the Nirvana, with 8 speeds and a non-Compact crankset. Really light wheels. Even details like hollow Cro-Moly saddle rails. Wanna go for pink slips?

### Upgrades from Nirvana

GripShift SRT-600 shifters	Hollow Cro-Moly saddle rails	Shimano STX-RC brakes
Shimano LX derailleurs, cassette, and rear hub	Alloy pedals	Bontrager Red/Blue rims
WheelSmith 15/16 ga. stainless spokes	IRC Smoothie tires	Sugino Fuse Pro cranks