CUNNINGHAM OFFROAD BIKE INFOPAC

Charlie Cunningham
Cunningham Applied Technology

Includes bikes by Cunningham, components by WTB, options, drawings, and price list.

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PRICE $2.00

INTRODUCTION

I began building mountain bikes with oversize aluminum tubing in 1978 making it the first application of this technology to offroad bikes in the USA. As the advantages become more widely recognized, other manufacturers are beginning to offer such bikes. Although welded and heat treated aluminum tubing is not new, its applicatiom to offroad bike frames is relatively new and my own experience indicates that there are many subtleties that the builder must be aware of to work successfully with this material. As other companies hasten to make aluminum mountain bikes available, they risk making mistakes from lack of experience and adequate testing. This is a big concern for the potential buyer and on a larger scale is something that could cloud the reputation of aluminum as a frame material. It is my conviction that aluminum, if properly engineered, will prove in time to be widely accepted as the ideal material for high performance bike frames. It is already used in almost all quality bike components. Every person that acquires a Cunningham ballooner can help support my effort to insure that aluminum gains an impeccable reputation as a frame material by providing me with information gleaned from the use of their bikes under all conditions.

As an avid rider myself, I am totally inspired by the unique performance characteristics of these aluminum bicycles. There are few experiences that compare to riding one of these finely tuned, high efficiency machines in the rough terrain they are designed for. My enthusiasm for wilderness riding, and the desire to make the experience available to others is why I have chosen to build a limited number of bikes each year. Every one is built to the highest possible standards, and I stand behind every one 100 percent.

I can report with great satisfaction that of the growing number of Cunningham bikes in use at the time of this writing, they all have happy owners.

CUNNINGHAM APPLIED TECHNOLOGY

Cunningham bicycles grow on special trees cultivated for the purpose by Cunningham Applied Tech! Actually, much as I would like such a set up, they are still being designed and hand built by me personally at my shop. The forks and many of the other components are also developed and built here. I ride every day so the workings of the bikes are always being evaluated and new ideas tested. The result is that the latest offroad technology is available to Cunningham owners before it is adopted by the industry and becomes widely available. Likewise, the format of this information packet is chosen in preference to a glossy brochure so I can update it easily and keep you informed on the latest equipment.

WILDERNESS TRAIL BIKES

In 1982, Steve Potts, Mark Slate and I combined our talents and resources with a partnership, Wilderness Trail Bikes, in which we work together to develop the finest in offroad equipment. Through WTB we are able to insure availability of our components for use on the bikes we build and also make them available to other offroad enthusiasts.

ALUMINUM FRAMES, MYTHS, PAINT, AND THE ZEN OF BICYCLE TECHNOLOGY

To eliminate misconceptions and help people understand oversize aluminum as a frame material, I offer the following survey of its characteristics to help you determine if a Cunningham Ballooner is the bike for you.

Most people are attracted to the aluminum frame by its performance and efficiency. The Cunningham frameset is lighter, stronger and more energy efficient than a well designed chromoly frameset. For example a 21" Cunningham frame is 2.5 to 3 lbs lighter than a top quality 21" lugless chromoly frame and is more than twice as strong in a frontal impact. (See Aug 83 Biketech for test results. Most lugless brazed steel frames bend comparitively easily at the headtube joints because of the annealing effect the slow cooling brass has on the nearby steel.) The large aluminum tubes produce a further benefit; a bottom bracket which is exceptionally flex resistant. This means that more of your energy goes into moving the bike forward, instead of becoming lost motion. For anyone that does a lot of riding these attributes are impressive. (The unparalled performance and efficiency of the bike is what got me involved in the first place!)

While large diameter aluminum frames excel structurally, they are slightly more susceptible to denting than a comparable steel frame. Denting has been extremely rare in the nearly 150 frames I've built, possibly because some of the tubes in a Cunningham are actually less dentable than their steel counterparts due to their greater thickness.

Aluminum also scratches more easily. Special care is needed when transporting aluminum bikes with steel bikes next to them to prevent steel from vibrating against the aluminum which can mar the frame.

Welded aluminum frames and the equipment and skills to work on them are rare and any modification or further work should be done by the manufacturer. This is usually the case with any custom frame, but it is especially true with aluminum frames. For this reason, I place a high priority on prompt response to your needs. I am usually able to do work and ship it out within a day or two of receipt. (The headset, bottombracket bearings, seatpost and other components are standard and can be replaced in any well equipped shop.)

"Oversize" aluminum tube bicycles seem to inspire either strong enthusiasm or stubborn skepticism in people. Occasionally heard comments from the Myth Department are: "They probably won't last." and "They must give a hard ride because the frames are so stiff." I would like to comment.

First, the experience I have gained working with aluminum frames for ten years, combined with excellent engineering, results in a frame that will last as long as the finest steel frames. The frameset is guaranteed to the original owner. I will replace or repair without cost any frame or fork that fails due to defective materials or workmanship during normal use. (It is noteworthy that during the many years of production none of my frames or forks have needed replacement.)

Another interesting aluminum frame myth I occasionly hear is that when an aluminum frame breaks, it snaps in half and the hapless rider eats dirt! While this is possibly true with the more brittle alloys used in glued and lugged frames, it simply is not the case with the alloy I use. Cunningham frames are quite springy and forgiving as tests (and horrors!...crash results) have shown. About the only way to bend one of these frames is to run over it with a car. And they will bend, not break.

When I began building frames many years ago I made some outrageously thin frames and didn't heattreat them to see how they would fail. After almost two years of pounding they began to creak around the headtube and an obvious crack grew for a week or so of use before the test was called off. I've learned over the years that failures from impact and fatigue are very rare and do not result in catastrophic self destruction as some people would have us believe.

Secondly, as for ride quality, my experience indicates that it is *not* the frame material that produces a hard or soft ride in a mountain bike. Any frame, be it conventional steel or oversize aluminum, *does not flex enough in the vertical plane to absorb road shock.* Frames dont act as springs in this direction because of the triangulated shape. A flexible frame can however twist and flex from side to side but this doesn't help absorb road shock, it only wastes precious energy. Some people claim that aluminum absorbs vibration better than steel which I have found to be true,but it has been my experience that the forks in particular and also the tires and frame geometry affect ride quality far more than the type of metal used in the frame. This is why I offer several forks with different ride characteristics and also different frame geometries... so I can set the bike up to match your individual needs.

In conclusion, it is my opinion that Cunningham frames use your energy more efficiently and with a wide range of component choices can be tuned to compliment your own riding style. They are the best bikes available anywhere for competition or touring.

If you really are looking for the best mountain bike, you shouldn't make your choice entirely on what sellers or builders, including myself, tell you. I give you my first hand kno wledge,but you owe it to yourself to ride the bikes you are considering and experience the differences first hand. There is so much hype and confusion created in a competitive marketplace about what is good and what isn't that the only way is to see for yourself. Give the bikes the last word with a test ride.

Last, I would like to consider beauty and aesthetics. My bikes reflect different values than those common in the bike industry. As builder and offroad rider I'm drawn to fine craftsmanship and technology that makes the bike *work better*. I consider cosmetics and "flash" of lower importance. Many people expect a beautiful, thrilling paint job with a bike of this cost. Such thinking is partly from the racing 10-speed world where flash is definitely "in" and the bikes are so similar that the paint job takes on special significance.

Steel frames need paint to protect them. My frames don't need paint to protect them and the polished aluminum frame gives one freedom from having to worry about the paint job. Out in the real dirt is where that beautiful paint job that was so attractive on the showroom floor loses its thunder. This is where you discover what you have really got and where a Cunningham won't let you down. Personally, I prefer not to add something to the bike that it doesn't need. I want a bike that is trouble free, totally reliable and fun to ride and I don't need paint on my bike to accomplish this. I do offer Imron colors as an option and don't object at all to someone ordering their frame painted.

When someone asks, "Hey, how come ya can see the welds?", I try to explain that there is beauty in efficient, functional design and that fine weld beads are beautiful to those who can appreciate them. Why try to hide them?

I offer this explanation to help people understand my bikes, not as an apology or a judgement on other peoples values.

FORKS

Fork requirements for mountain bikes are much different than road bikes. The narrow high pressure tires on road bikes can't absorb much shock, so a fairly flexible fork is needed to contribute to shock absorbtion. On mountain bikes the large tires are the primary source of suspension because of their much greater compressibility. The "New Generation Tires" such as the Ground Control are perfectly suited to the task because of the exceptional suppleness and dampening qualities engineered into them. Flexible forks can add to shock absorbtion on a mountain bike but they have some drawbacks due to the fact that they behave like *undamped springs*. (Undamped means they continue to bounce after impact. Imagine riding a motorcycle with springs but no shock absorbers.)

The ideal balance of flexibility and stiffness in a fork is a matter of personal preference. I offer several different fork styles that cover a wide range of needs. Fork choice is important and should include the following considerations:

There is a simple, unavoidable tradeoff with unsprung forks involving comfort, handling and braking control. (Sprung forks with springs and\or even shock absorbers have their own problems, including high weight, complexity and rider energy absorbtion and aren't considered here.)

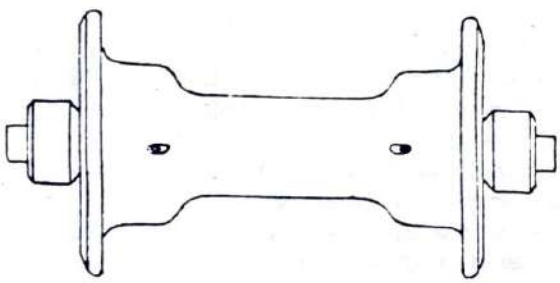
A fork with flexible blades will give a softer, more comfortable ride, but the same flexibility that provides comfort detracts from control under hard braking and can resonate in a way that adversly affects handling. A rider that places a high priority on maximum comfort and rarely uses the front brake hard may not need a stiff fork while a rider that has powerful front brakes and uses them hard, can appreciate the stability that the stiffer fork styles provide. Rider weight is also an important factor in fork selection. Light riders can use a more flexible fork than heavy riders with comparable ride qualities.

The common "unicrown" fork is popular with builders because it is light, easy,and inexpensive to manufacture and has a nice appearance. Its high flexibility and relatively low strength help protect light gauge steel frames from fatigue cracks and impact bends. A Cunningham designed and built Unicrown Type III is offered as an option on Cunningham frames and is suggested for light riders, casual riding or long distance touring. Its drawbacks which are undesireable resonances and "autosteer" (twisting and side to side flex) only show up under agressive riding. For Type III fork,subtract $20 from price of frameset.

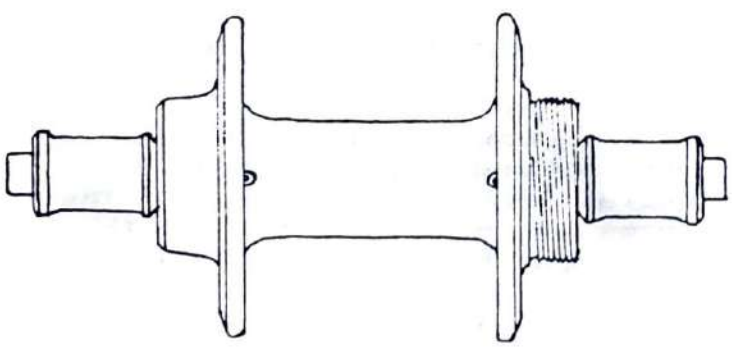
A Cunningham designed Type I Fork is standard on Cunningham framesets at no extra cost. The crown is tubular 4130 chromoly, manufactured by myself to receive special Reynolds oval blades. The oval blade/tubular crown design produces a very efficient shape that excels at shock absorbtion while resisting undesirable twisting and flex from braking. The Type I is a beautiful, curved fork that gives a responsive, comfortable ride and has strength well matched to the unusually strong frame. I consider it to be the best fork for most riders. The steerer on this fork and also the Type II racing fork has extra wall thickness in the crown race area compatible with the strong crown and blades. All of the mountain bike forks have 2.0" offset.

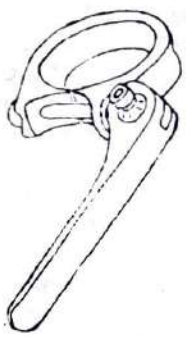
Another option, the Cunningham Type II fork is suggested for racing. It is also fabricated from a Cunningham 4130 tubular crown, but uses straight large diameter, thinwall, internally butted blades. It is the most labor intensive of the forks to build. Weight is equal to the Type III but its qualities are on the opposite end of the spectrum.

Although it gives a slightly harder ride than the others, it is characterized by unusual "dampness". Many riders including myself have observed that this fork resonates the least after the wheel hits an irregularity in the road and it has been found to be the most stable under braking. Thus, this fork is well suited to hard high speed riding where maximum control is worth a slight loss of comfort. For Type II Fork option, add $75 to price of frameset.

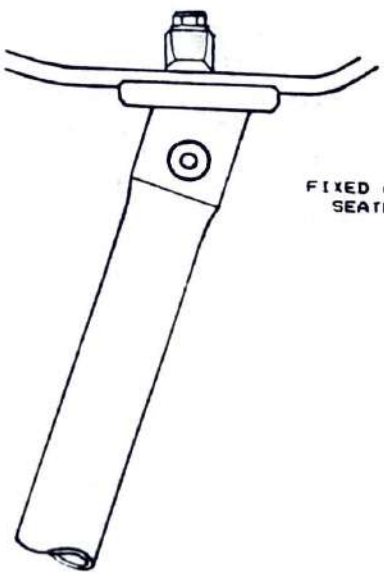


WTB HUBS





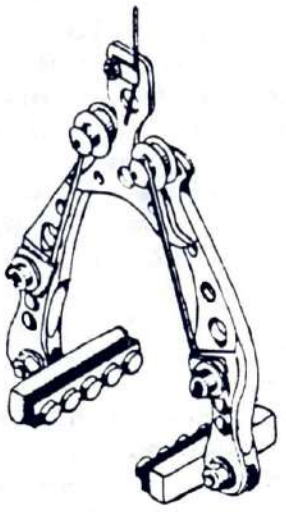
CUNNINGHAM
LIGHT WEIGHT
QUICK RELEASE



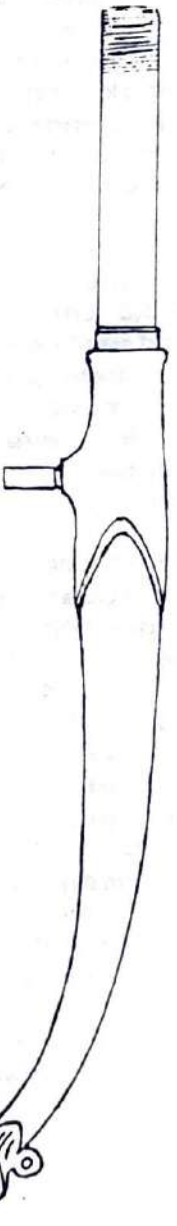
FIXED ANGLE
SEATPOST

SPEEDWORKS

MTB ROLLER CAM BRAKE



CUNNINGHAM
TYPE I FORK



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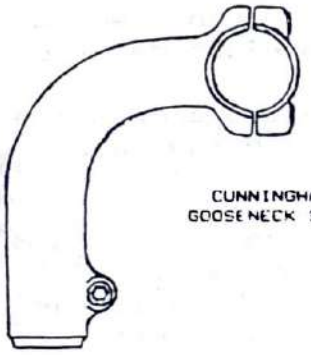
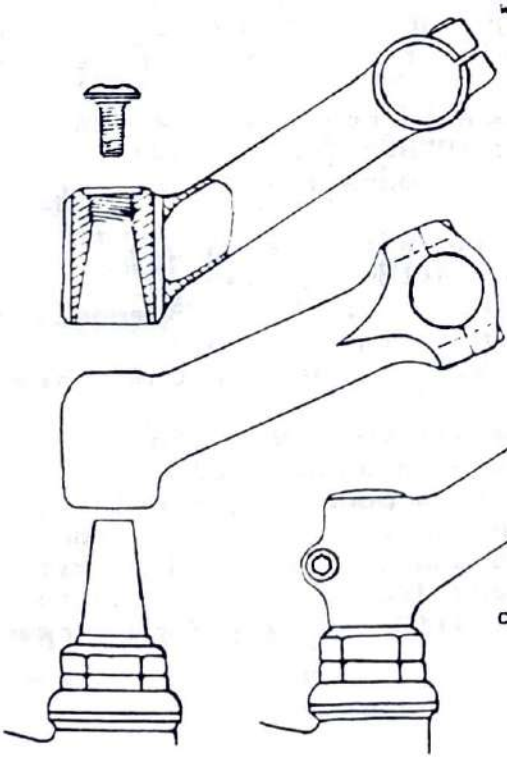
TYPE II FORK



CUNNINGHAM
GOOSENECK STEM

CUNNINGHAM 4130 STEM
WITH TAPER ADAPTOR



MTB ALUMINUM
TAPER STEM

CUNNINGHAM 4130 STEM
WITH PINCH BOLT

THE WTB ROLLER CAM BRAKE

The finest brake available for All Terrain Bicycles. Features high mechanical advantage for exceptional stopping power. Mechanical advantage, arm centering, and lever tension are adjustable. The brake is also highly suitable for tandems and BMX.

This brake is the outcome of a developmental effort that began five years ago, when I needed to design a brake system ideally suited to the unique requirements of ballooner bicycles. Their big wheels are heavier, and hence store more energy than "ten speed" wheels, particularly when spinning at high speeds. The more common cantilever brake is adequate at medium and low speeds, but flexes too much, and does not generate enough pad pressure to utilize the full traction potential of the tires at higher speeds. They are also exposed where they can cause injury or be damaged themselves.

I experimented with various mechanical brake systems for years, gaining design insight, both from personal experience, and the many different riders who have tested the prototypes. This led to the choice of the cam and roller principal as the most promising for reasons too numerous to mention here. This ancient concept was adapted to meet the needs of modern offroad bike technology.

Steve Potts and Mark Slate, my partners in Wilderness Trail Bikes, have joined in the developmental effort. Together we have brought the brake to a point where it is being manufactured and offered to the owners of our bikes.

It is currently being used by top offroad racers across the country, and was recently chosen by Lon Haldeman and Sue Notorangelo for their new record attempt tandem.

One of the features that sets this brake apart from its predecessors, and makes it especially well suited to the offroad environment, is the linear spring system which provides for independent adjustment of tension on each brake arm. The linear spring provides much more positive centering than coil springs which is important for proper pad centering in severe mud conditions, and also allows the brake lever tension to be tuned by the rider to match his or her own needs. The mechanical advantage (brake power) can also be tuned by using different cams or by modifying the shape of the stock cam.

On the bicycles that I build, the brake is mounted underneath the chainstays, a location that I pioneered in 1978. The chainstays, thicker and shorter than the seatstays, are a more flex resistant base for this powerful brake.

I have applied for a patent on the brake with its unique features, and have contracted with Suntour, allowing them to manufacture their version of the brake. The original WTB/Speedmaster version will continue to be manufactured on a limited scale, and offered as an option on Cunningham bicycles. WTB Roller Cam Brakes: rear, add $155.; front, add $115.

WTB has recently developed a more compact version of the brake, specifically designed for use on skinny tire tandems, cyclo cross, touring bikes and HPVs. The WTB Mini Cam is a powerful, sensitive brake that totally outperformes standard brakes. It is an option on Cunningham Cyclo Cross\Multi Purpose bikes and is also sold in kit form with complete mounting instructions and jigs. Mini Cam option on Cunningham bikes; rear add $155, front add $115 In kit form : rear and front $149

THE/WTB GREASE GUARD SYSTEM

This uniquely simple and effective Cunningham lubrication concept for sealed cartridge bearings will revolutionize bearing use on bicycles. This system gives the owner all of the advantages of cartridge bearings (structural superiority because of less shaft overhang, greater load capacity, no adjustments necessary, uniform high precision and a standard part that is available anywhere at reasonable cost) while eliminating their previous disadvantages (fast wear caused by mud and water sneaking under the seals and causing bearing play which in turn required frequent replacement).

The WTB Grease Guard System allows the owner to purge all of the bearings on the bike with fresh waterproof grease with ease after the bike is used in wet or muddy conditions. The fresh waterproof grease flushes from the inside edge of the bearing out through the outer seal, pushing any water and grit ahead of it. This allows the bearings to give years of trouble free service. Now bearing replacement will be rare if ever. A patent on this innovative system has been applied for by WTB and it is available for the first time anywhere as an option on Cunningham bikes. Grease Guard Bottom Bracket option: $60, includes special grease gun (which also works on new WTB Hubs) and a tube of special grease.

WTB HUBS

The new WTB Hubset is unparalled in design excellence and material quality. It employs the revolutionary WTB Grease Guard System which vastly extends the life of the top quality Fafnir bearings. The hubs are one piece precision machined aluminum which is polished and clear anodized. The flange diameters, spacings and freewheel seat location are all optimized for the best chainline and strongest possible wheel. The rear hub has zero dish with standard 6speed spacing and the extra wide front flange spacing gives maximum shock absorbtion and lateral strength. The rear axle is precision ground 4130 tubing and the front is high grade aluminum. The axle caps are available in various interchangeable lengths so that different combinations of dropout spacings and freewheel widths can be accomodated. They are 126mm with stan 5spd, 131mm with stan 5 or 6 spd, 136mm with stan 6 spd.

On Cunningham bikes the hubs come with very light rolled thread skewers and aluminum nuts which receive a stainless steel pin for tightening. The dropouts on Cunningham frames are designed so that the powerful pinch of a quick release is unneccesary, but for those that prefer the convience of quick releases with their slight additional weight, the hubs are supplied with Campagnolo QRs. The hubs are 36 hole but can be special ordered in 32 hole. WTB Hubset, 36 hole, with light skewers: $135 pr; WTB Hubset with Campy QRs: $150 pr; For 32 hole add $5 pr; WTB axle cap puller: $7.50; WTB bearing puller: $9.50

FIXED ANGLE SEATPOST

The WTB fixed angle seatpost is Cuningham designed and is offered in 320mm extension. It allows normal fore and aft adjustment of the saddle. The saddle rail clamp on this seatpost is about an inch

farther forward than with most other seatposts. This unique feature makes it possible for a rider to position the saddle farther forward than would normally be possible with any given seattube angle. (The effect is equivilant to a seattube angle about one degree steeper.) The appeal of this post is its light weight, reliability and clean simple appearance. Its limitation is that once the angle is set properly, a change of saddle types sometimes requires a readjustment of the angle, a process which involves some careful filing. (I will re-mill the angle for $10.) Add $62 to price of frameset for this option.

LIGHT WEIGHT SEATPOST QUICK RELEASE

The Cunningham designed quick release is based on a cam lever principle and is made out of 7075-T6 aircraft aluminum. It is about an ounce lighter than the normal steel Suntour quick release that is standard on the bikes. The moving parts are, however, more exposed to the elements so it requires an occasional drop of oil to insure that it works smoothly. Add $50 to price of frameset for this option.

WTB ALUMINUM TAPER STEMS

The unique WTB Taper Stems are works of art, fully machined from high grade 7075-T6 aluminum. The combination of beautifully polished finish, structural integrity, and light weight put these stems in a class of their own. They mount on a 4130 taper tube which is silver brazed into the steerer. This original WTB Taper mounting allows the 6mm socket stainless steel fixing bolt to be on top where it blends perfectly with the form of the stem and the knees won't hit it. They also feature a four bolt removable cap plate which makes handlebar changes and adjustments easy. The rise angle on these stems is 25 degrees and they can be ordered in 10, 12, and 13cm lengths. Included with the stem is a simple threaded puller. They are also offered with standard expander plug mounting so they can be retrofitted to any mountain bike, tandem or road bike. Bar hole size is same as the chromoly stem, 1.030". For a WTB Taper Stem mounted on your Cunningham (includes taper tube silver brazed in steerer), add $110.

CUNNINGHAM CHROMOLY STEMS

Two mounting systems are available. The innovative WTB taper system uses a precision aluminum adaptor which fits into the back of the stem. When the bolt is tightened, the adaptor expands and locks the stem to the taper tube resulting in beautiful and clean lines with no bolt in the back to hit your knees on.

The other system is the straight 7/8" O.D. 4130 tube which is also silver brazed into the steerer. This stem attaches with a recessed allen socket pinch bolt on the back end. This system is offered for those who want to mount stems or bars made by other manufacturers on the bike. Both mounting systems are light, simple and reliable. Each stem style is custom built from 4130 tubing which is joined by fillet brazing with the joints carefully smoothed and finished with silver Imron. They can be ordered in 20 or 30 degree rise and any extension from 6cm to 14cm in 1.0cm increments. The bar

hole is 1.030" I.D. A machined 2 piece aluminum shim is used to mount the WTB Flatbar or other 7/8" O.D. bar in the stems.

Similarly built chromoly Gooseneck Stems are also made expressly for drop bar use on Cunningham offroad bikes. They mount on either the 7/8" bushing or the taper with an adaptor. They position the bars higher and are available in various extensions and heights, and are normally used with Cinelli 64 drop bars which have had the bends modified for offroad racing or the new WTB Aluminum Bar. No shim is necessary in this case. For either Flat Bar Stem or Gooseneck Stem add $150; Cunningham 2 piece handlebar shim, 1.030" to 7/8": $9.25

WTB ALUMINUM HANDLEBARS

The new WTB Aluminum Handlebars are a carefully researched design resembling a modified drop bar but with less drop and reach and a slightly different hand angle. The bar combines the advantages of drop bars and flat bars. It is normally used with drop bar brake levers and barcon shifters or the custom WTB shifters which mount on the inner sides of the bar near the brake lever. The WTB Aluminum Bars are made of special gauge heattreated aluminum tubing with an integral sleeve which eliminates the need for the 2 piece shim. WTB Alum Bars: $24.95

CUNNINGHAM MODIFIED PUMP

A quality aluminum frame pump is Cunningham modified to fit into the seattube. It presses by hand into the underside of the seatpost and is prevented from rattling with a rubber spacer on the other end. The pump is out of the way and is clean and dry when you need it. Modified Pump, $17.50

WTB PEDAL FLIP

The WTB Pedal Flip mounts on the rear of the pedal and is sold in pairs with mounting hardware. It is designed expressly for touring or racing use with touring type shoes and toe clips. They allow the foot to get into the clips very quickly and easily with one clean stroke. They are made of plated spring steel and the shape of the barb has been carefully researched for years. It is very advantageous for cyclo-cross or when doing trail riding where dismounts and remounts are frequent. They were used by nine of the top ten racers at the 85 NORBA Nationals. WTB Pedal Barb, $9.95 pr.

WTB TOE CLIPS

WTB offers a unique unbreakable laminated plastic toe clip kit which allows you to mount the clip of correct length so that the strap is over the pedal spindle. This makes it easier to get the feet into the clips during fast paced riding and the more forward location of the strap allows the foot to be pulled out in emergencies. WTB Toe Clips (specify sm, med or large), $18.50 pr.

COLORS

For $110 additional, the frame, fork, and stem can be painted your choice of Imron colors. The paint is applied on the carefully prepared as welded frame.

An even more strikingly beautiful effect is created where all of the joints are made perfectly smooth by the use of a special low density filler before painting. The process requires days of labor but results in an incredible dimension of beauty that will appeal to those with a refined sense of aesthetics. This option is $450.

FRAME CONSTRUCTION

The frames are constructed from large diameter 6061 aluminum tubing which is TIG welded in a special jig designed to insure perfect alignment. The problems usually associated with TIG welded steel frames such as the small size of the weld bead resulting in stress concentrations and also weld zone embrittlement caused by high cooling rate are not present in a properly built aluminum frame. After welding, the frames are heattreated in a carefully controlled process which completely stress relieves the welded aluminum and brings it to its full strength (the T-6 condition). Maintaining alignment during the process is crucial. A process based on years of experience is used to accomplish this. Each frame receives two alignment checks during its manufacture. The frames also receive several unique proprietary treatments that further enhance their characteristics and really distinguish them from all other welded aluminum frames.

Cunningham offroad frames have an unusually wide bottombracket shell for better spindle support and extended bearing life. The unique Cunningham machined aluminum cable stops are attached to the frame using techniques derived from the aerospace industry. More desirable than cable-housing guides, cable stops allow crisp brake and derailleur control. The frames are guaranteed for life to the original owner.

FRAME GEOMETRIES

I build three distinctly different ballooner framestyles; the INDIAN, the RACER, and the LITTLE PEOPLES BIKE. The geometries of each are the results of knowledge accrued from countless hours of offroad riding by myself and other experienced riders.

THE INDIAN

Named with regard to the Native Americans who lived here before us, and whose respect for and attunement to the land is a model for contemporary lovers of the wilderness. The Indian is designed with moderate angles and wheelbase which makes it an excellent, practical all around bike with very forgigving handling qualities. The Indian is "user friendly". It is stable, well balanced and comfortable to ride. This frame has excellent clearance for the biggest tires on the market. This is the bike Steve Cook prefers for mountainbike racing. You can ride this bike off road all day and feel comfortable and relaxed on the bike at the end of the day.

INDIAN Geometry:

Fork offset	2.0"
Wheelbase:	43.50"
Chainstays:	17.75"
Bottombracket:	12.0" with 2.125 tires
Headtube Angle:	69.5 degrees
Seattube Angle:	71 deg (72 on 22&23" frames)
Seatpost Diam:	27.0mm
Rear dropout spacing:	135mm
Sizes availavble:	19, 20, 21, 22, 23"

THE RACER

The Racer is a shorter frame with slightly steeper angles which gives it quicker handling. The short chainstays allow a greater percentage of weight to transfer to the rear wheel when climbing out of the saddle. The shorter wheelbase and steeper angles demand greater experience on fast decents and require more attention from the rider. The Racer excells on narrow single track trails and steep climbs. Its nimble responsive nature make it popular for racing and fast,lightly loaded touring. This frame is now built with full clearance for the largest 2.125 tires.

RACER geometry:

Fork offset:	2.0"
Wheelbase:	42.0"
Chainstays:	17.1"
Bottombracket:	11.875" with Ground Control Tires
Headtube angle:	70 degrees
Seattube angle:	71 deg(72 deg on 22" frames)
Seatpost diameter:	27.0mm
Rear dropout spacing:	135mm
Sizes:	19, 20, 21, 22"

SLOPING TOPTUBE AND LARGE DIAMETER SEATPOST OPTION

The Indian and Racer frames are also available with a sloping toptube and large diameter seatpost. This option makes the frame about 1/2 lb. lighter and further stiffens the bottombracket area. The sloping toptube gives added crotch clearance which can be used to advantage on difficult terrain such as rough trails where one can lower the body, extend a leg over obstacles, and pull the bike over without dismounting. This type of frame is easily shouldered for carrying, but there is usually not enough room to hook the arm around the toptube as on a horizontal toptube. *This option does not change the handling of the bike, as the geometry is unchanged.* The greater surface area of the large seatpost creates more sliding friction. People that raise and lower the seatpost a lot would be better advised to use the standard size seattube. The other drawback of this option is that your seatpost and front derailler are non-standard which is something to be considered if you are touring in distant lands. Add ~~$215~~ for this option.

THE LITTLE PEOPLES BIKE

Designed for the many people who are unable to find a proper fit on conventional small mountainbikes. The bike uses normal 26" wheels instead of the 24" wheels sometimes offered by other builders which compromise efficiency and handling qualities. The design also avoids

the tiny headtube found on many small frames which puts enormous loads on the headset bearings. This bike has an unusually low toptube to ground clearance of 26 1/2". This is accomplished by sloping the toptube and seatstays downward. This is not possible with cantilever brakes because the rider's heels would hit them. It is possible though with the compact WTB Roller Cam Brake which also dramatically increases stopping power. Presumably the shorter person is also lighter, and can appreciate a 24 lb bicycle. The people currently using them include a national class woman racer, an offroad tour leader, and a Harvard professor. Each has his or her reasons for a top quality bike, and each is overjoyed to have a bike that fits and handles perfectly. The frame is built with full tire clearance.

LITTLE PEOPLES BIKE Geometry:

Fork Offset	2.0"
Wheelbase:	42.5"
Chainstays:	17.25"
Botombracket:	11.5" (with Ground Control Tires)
Headtube angle:	70 degrees
Seattube angle:	70 degrees
Rear dropout spacing:	135mm

Size: One size for those who would normally need a frame smaller than 19".

CYCLOCROSS/MULTI PURPOSE BIKE

This is a rugged skinny tire bike which is built for tires up to 35mm or 1.375". The bike is a light 21 lbs with Expedition tires. I have enjoyed my own M.P. bike so much that it has inspired me to build this incredibly practical and fun bike for others. My appreciation of this type of bike stems from the fact that it is very efficient on pavement, while being tough enough to go anywhere a mountain bike can go with a little rider finesse. The bike is ideal for efficient travel over varied terrains, including pavement. With lighter rims and tires it can double as an excellent road bike. The Cross/M.P. is sold as a complete bike with the following specs:

WTB Mini Cam Brakes on rear, Mafac cantilever front brake, Cunningham Type IV Fork with Tubular Crown, Cunningham 4130 Taper Stem, Edco Competition headset, Araya 20A clincher rims, Wheelsmith spokes, WTB Hubs, Expedition or TriCross tires, and MP-1000 pedals.

The bikes have a 27x1.375" wheel on front and a 700Cx35mm on the rear for better handling. The sloping toptube/ large diameter seatpost option is also available on these bikes. Price is about $2900 depending on componentry and options.

CROSS\M.P. geometry:

Fork Offset	1.75"
Wheelbase	40.375"
Chainstays	16.375"
Headtube	72.5 deg
Seattube	72.5 deg
Seatpost	27.0 mm
Dropouts	135 mm
Sizes:	19,20,21,22,23"

If your needs can not be met with any of the bikes above, I am willing to build frames to your specifications if your request seems reasonable and I have time. Depending on the changes this may cost more due to increased set up and handling time.

My bikes are on display at the following locations where they can be test ridden and purchased or orders placed. I can send photos of the type of bike you are interested in if you are unable to see them at these shops. A complete bike can usually be delivered in 3 to 8 weeks. Framesets can be delivered with even less delay.

Complete bikes usually range in price from $1950 to $3650 depending on options and component choices.

After reading the Infopac and deciding what you want, an order is usually placed at one of the shops that sell the bikes. I like to be available to answer questions and to get to know the people that buy my bikes but there is so much work to be done that I need to limit the amount of time I spend talking. I would like to hear from you if you are buying a bike and definitely want to help take care of any problems that may come up that the shop can't handle.

Point Reyes Bikes, 11431 Hwy. One, Bx362, Point Reyes, Ca 94956
(415) 663-1768 Michael Castelli or Marshall Livingston

Avenue Cyclery, 756 Stanyan Street, San Francisco 94117
(415) 387-3155 Gene Maruszewski

Paradise Bikes and Skis, 224 Elk Ave., Crested Butte, Co 81224
(303) 349-6324 Steve Cook

FRAMESETS, COMPONENTS AND SERVICES

Basic framesets include the following:

Type I fork, Edco Competition alloy headset, easily replaceable standard 37mm sealed bearing bottombracket with Phil Wood spindle, Suntour seatpost quickrelease, Suntour 300mm seatpost, front and rear Mafac cantilever brakes, Suntour Cyclone II or Shimano Deore front derailleur, water bottle cage mounts, all cable stops and rack bosses on dropouts. The various options listed elsewhere can be substituted or added to the basic frameset.

INDIAN frameset:	$1805.00
RACER frameset:	$2206.00
LITTLE PEOPLES frameset:	$1512.00

Cinelli 64 drop bars modified for offroad racing: $22.50
Custom aluminum front brake cable hanger: $7.50
Extra waterbottle cage mounts: $25/pr.
Blackburn rack mounted on rear: $32.50
Replacement hub bearings: $7.50 ea.
Replacement bottombracket bearings: $6.00 ea.
Replace your hub bearings: $10 labor
Replace your bottombracket bearings: $15 labor
Retrofit your HiE/WTB Hubs with WTB Grease Guard System $50
Retrofit your Cunningham Bottombracket for WTB Grease Guard $50
Grease gun for WTB Grease Guard System $10.50
8oz tube of special grease $8.00

1985 RACING SUMMARY

The Wilderness Trail\Suntour Offroad Team produced the best overall placings of any team in 1985. The riders, Jacquie Phelan, Roy Rivers, Casey Kunselman, Todd DeAngelis and Joey Peterson displayed consistient excellence throughout the year. Some highlights were Jacquie's win on her Cunningham in the Man vs Horse vs Runner Race in Wales, and her third National Championship win at the 1985 NORBA Nats in Santa Barbara. All four WTB Mens ProAm riders placed in the top ten at the NORBA Nationals with Roy leading most of the race and getting a close second to Joe Murray. Casey hammered out a strong fourth, Todd got eighth and Joey tenth. Casey and Todd then went on to race the cyclocross season on their Cunningham Cyclocross bikes, with both doing very well in the regional races (Casey winning all entered!) and then also getting top placings at the USCF Cross Nationals in New Jersey. Casey was selected for the USCF Worlds Cross Team and went on to race his bike competively in Europe.

The Wilderness Trail Team has earned a solid reputation for being fast, competent, likeable riders on quality bikes.

We will be back on the offroad circuit in 1986, again proving the performance and reliability of our latest components and bikes.

SEATTUBE ANGLES

There is some confusion about steeper than usual seattube angles that have become popular with some mountainbike builders recently. Without going into the complex subject of frame geometry I'd like to say that I think "handling geometry" and rider fit should be considered independently. Handling geometry is what determines the handling qualities of the bike. It is: headtube angle, fork offset, wheelbase, chainstay length and bottombracket height. Then, a separate but related concern is the rider's seated position on the bike which is determined by seattube angle, seatpost type (see section on Fixed Angle Seatpost) and stem reach and height.

A frameset should not be built in such a way as to require the rider to be in a certain position for it to work right. Rather, *the frameset should work properly when the rider is in his/her most ergonomically efficient position.* The location of saddle with respect to bottombracket is very important and varies widely from one rider to the next depending on build and leg length. For example a 73 degree seattube is usually way too steep for a short rider because it puts the saddle too far forward with respect to the bottombracket, and occasionally not even steep enough for a rider with very long legs. A steep seattube angle is right for some but definitely not all people.

I ride a bike with 17" chainstays, a 71 degree seattube and the tip of my saddle is 3.375" behind a vertical line thru the bottombracket. Some would say that I should be uncontrollably lifting my front wheel on steep climbs, but to the contrary, I am able to modulate the location of my weight by moving around on the saddle to maintain maximum traction (front wheel just shy of lifting). I can also easily loft the front wheel over obstacles when necessary. Then on decents my saddle location allows my weight to be well to the rear and low on the bike.

This is what works for me. What you need depends on your build and riding style. If you know what your best riding position is, I can tailor the components and if necessary the seattube angle to position you correctly. The main point here being that the bike should be made to fit you, not the other way around.