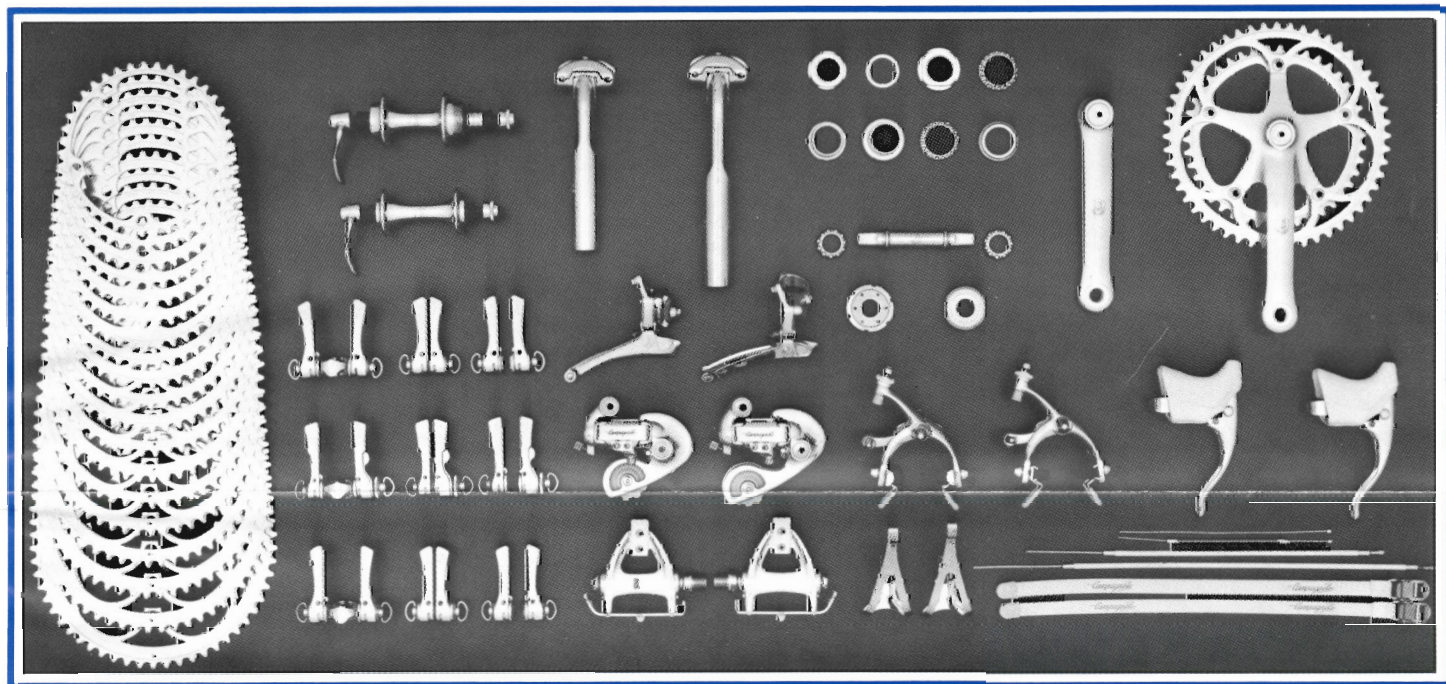


# Record News

SUMMER 1987

Vol. 2 No. 4

## The Campagnolo "Chorus Gruppo" Climbing One More Step Toward Cycling Perfection



For over fifty years Campagnolo has produced racing components considered both state-of-the-art and industry standards. Now Campagnolo is introducing a new series of innovative components that will symbolize the same top quality for the sport cyclist. This series, the **Chorus Gruppo**, will withstand the rigors of sport cycling and triathlons with the performance found in all Campagnolo racing equipment.

### The Campagnolo Chorus Gruppo

The Chorus Group is a harmonious combination of components characterized by their great versatility. The Chorus constituents provide distinguished performance for every path and any detour.

The Chorus equipment performs as if it were on a stage singing in unison. They are unified, but it is more than aesthetic resemblance. The strength, durability and precision go to the same depths for every member of the Chorus. Harmony is their heart and soul.

### Chorus Crankset

The Chorus crank arms, with their visually distinctive geometric pattern, are designed to have improved shear strength, rigidity and durability.

The curvature of the arms controls flex by reducing the length of the axle in the bottom bracket. The mounting tapers are set as close to the bottom bracket centerline as possible. The curve gives the pedals suitable spread for proper foot placement, chainstay

clearance and for increased ankle clearance for those who ride in a substantial toe-out position.

The Chorus crankset has been designed by Campagnolo Research and Design Engineers using computers for full field stress studies. The computers calculated how the cranks would best transmit as much of the cyclist's energy as possible through the full rotation of the chainwheel. They also helped determine the best overall profile of the crank arms.

During the same analyses, the Campagnolo engineers examined -- in both laboratory and racing settings -- the tensile properties of the Avional aluminum alloy (the same as used in C-Record) in the crank arms. As a result of this research, the hot molding technique developed and used in production better maintains the fibrous



structure of the alloy.

Crankarms are available in 167.5, 170, 172.5 and 175 mm lengths.

The chainrings are made from the same wear-resistant Avional, as other Campagnolo chainrings. Every chainring is cut tooth by tooth on a computer-controlled gear-cutting machine, in the standard Campagnolo tooth profile that has proved to extend the life of the chainrings and the chain.

The chainrings are cut in an asymmetrical pattern to keep the chain from falling between the chainrings during shifts from the outside to the inside. The chainring cutouts and the bolt circle are the same as the C-Record (135 mm) and are available from 39 to 57 teeth. Chainrings from 48 to 57 teeth come with a pin to prevent the chain from being caught between the crankarm and chainring.

The bottom bracket is similar to other Campagnolo bottom brackets. The axle is made of case-hardened steel. The axle and the cups are both precision-ground and rotary-polished for use with high precision bearings. The  $\frac{1}{4}$ " balls come in matched sets of chrome-steel bearings with a tolerance of .001 mm (1 micron). Bottom brackets are available in English, Italian and French threads.

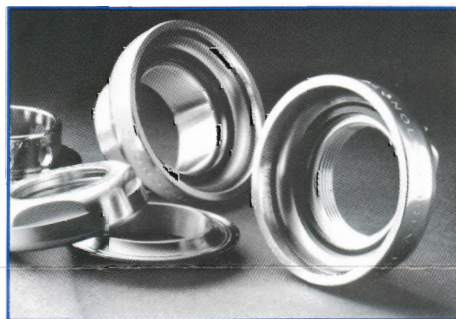


Due to the design of the crankarms there is no offset to the bottom bracket spindle. The axle can be installed either way since the left and right sides are the same.

## Chorus Headset

The Chorus headset has the general aesthetics of the C-Record headset yet possesses internal innovations. The lower cup-bearing race is cushioned by a material we call SELFORM, a semi-elastic polymer that helps reduce road shock. This SELFORM liner helps disperse fork loads -- from both rider and road -- across a larger bearing area. This avoids single points of high stress and brinelling of the races.

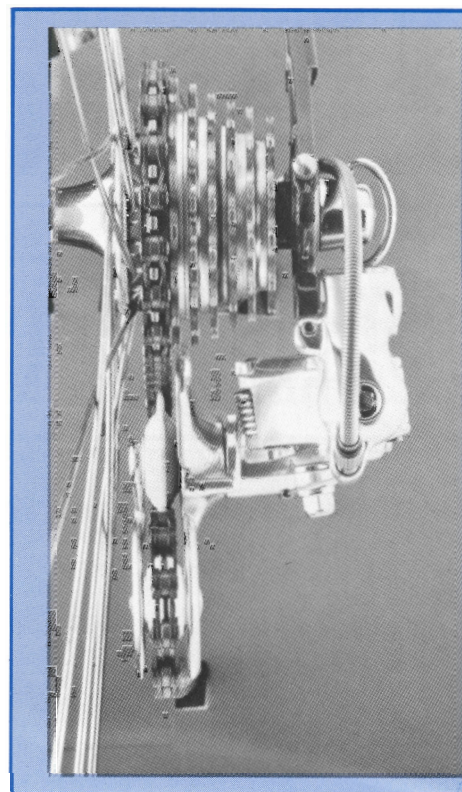
The lower race has a Nylon shield to keep road contaminants from penetrating and adversely affecting the headset races or the bearings. The expected life of this headset is double that of conventional designs.



## Rear Derailleur

The Chorus rear derailleurs have a new system that allows the derailleur to be used in a wide range of situations without sacrificing performance. A bicycle designed and equipped with a Chorus rear derailleur for racing may now be utilized by the sport cyclist or anyone wanting wide-ratio gearing without changing derailleurs.

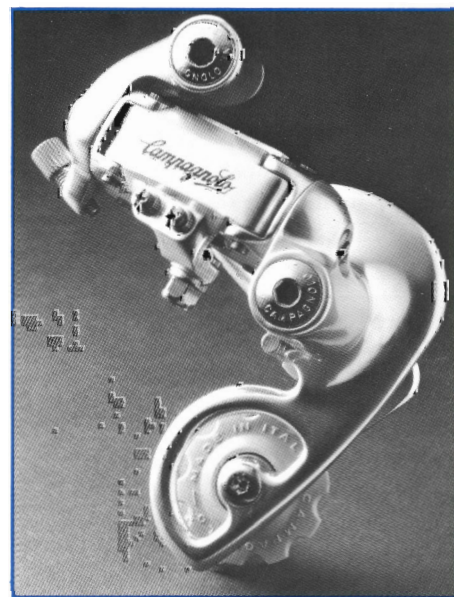
This is done through our new Chorus Dual-Mode system. This innovation is used to control the angle of incidence in the derailleur's parallelogram. (The angle of incidence is the degree of slope at which the pulley cage drops as it moves from the outer, or smallest cog to the inner, or largest cog.) The derailleur has two settings: setting A has an angle of five degrees, setting B an angle of 30 degrees. The pulley cage will stay perpendicular to the hub axle in either setting. The Chorus derailleurs can be changed from A to B position by only loosening



two bolts, turning the body of the derailleur and retightening the bolts.

The design of the Chorus also allows the derailleur's angle of rotation to be set to match the drop length and rotational stop of the dropout hanger.

The Chorus is available with either a short or long cage. The SM (short cage) version will handle a large cog of 27 teeth with an 18-tooth difference in the chainwheels in the A position and a large cog of 32 with the same chainwheels in the B position.



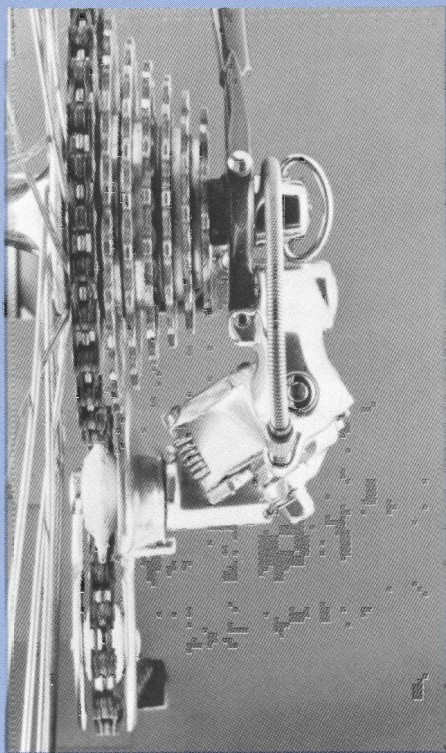


## Front Derailleur

The Chorus front changer is the same general geometry and finish as the C-Record unit with one major difference, the derailleur cage. The Chorus cage has been widened at the rear and is narrow at the tip. This allows the user to make a full series of shifts without having to trim the front changer. The narrow tip provides fast, positive changes everytime. The inner and outer guide plates are chrome-plated for wear resistance and smooth shifting action.

The lifting arm pivots are of the same treated, stainless steel construction as that of the rear derailleur body. The adjustment screws are stainless steel with coaxial keeper springs to ensure adjustment accuracy.

The Chorus front derailleur is available in a standard clamp-on version as well as a braze-on. The



The LG (long cage) version will handle a large cog of 30 teeth with a chainring difference of 18 teeth in the A position and a 34-tooth large cog with the same chainrings in the B position.

The Chorus derailleur is built with the same materials and attention to detail as the C-Record. It is held together with stainless steel pivot pins treated with Teflon to resist friction. The idler and jockey pulleys are made of semi-elastic polymer bodies spinning on steel rollers and lubricated bronze bushings. The adjustment screws are stainless steel with coaxial keeper springs to ensure adjustment accuracy. The entire body and cage have an anodized finish.

The Chorus derailleurs will work with any Campagnolo shift lever, especially Syncro. The derailleurs have a built-in barrel adjuster for Syncro.

Due to the design of the Chorus derailleur it can be separated into three different parts for added serviceability. If, for example, the parallelogram should become loose or damaged, it can be separated from the upper and lower body and replaced.



clamp-on is available for standard steel seat tubes as well as the oversized aluminum or carbon fiber seat tubes.

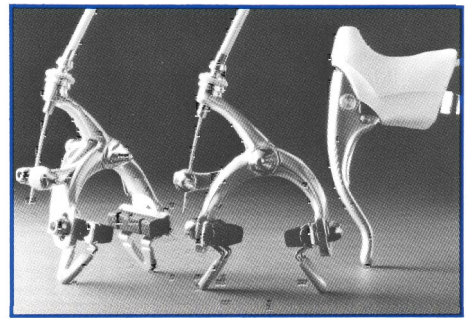
The recommended maximum difference in chainrings is 18 teeth (57/39 for example).

## Chorus Brakes

The Chorus Brake is based on the proven, leading design of the Nuovo Record Side Pull Brakes and is built to be more compact and predictable than other side-pull caliper systems. Its most outstanding feature is the arms' uni-planar construction. One arm passes through the other. Correcting for two different rotational planes of the arms is unnecessary since there is a single action plane.

The strength of the caliper arms and the lathe cut pivot bolts contribute to

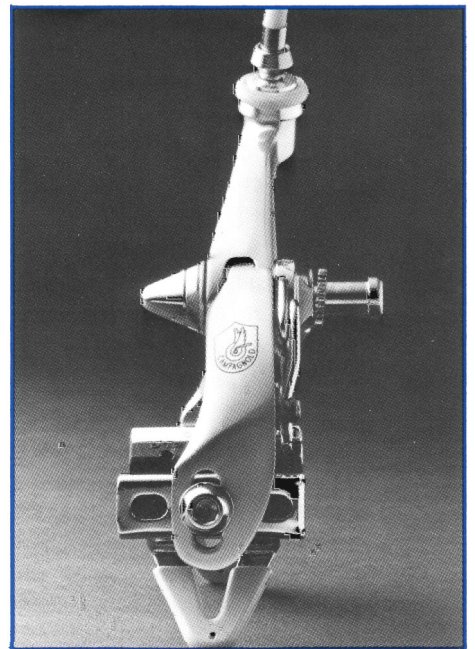
the system's rigidity and eliminates vibrations (particularly dangerous in the front brake). The rigidity and



mechanical advantage ratios have been calculated to work together. The brake has quick speed control action but does not have such overwhelming braking power that could lock the wheel.

The caliper return springs are chrome-plated, high-tension steel and slide across Teflon-coated clip pins to give the brakes the ability to disengage quickly and smoothly even after years of use.

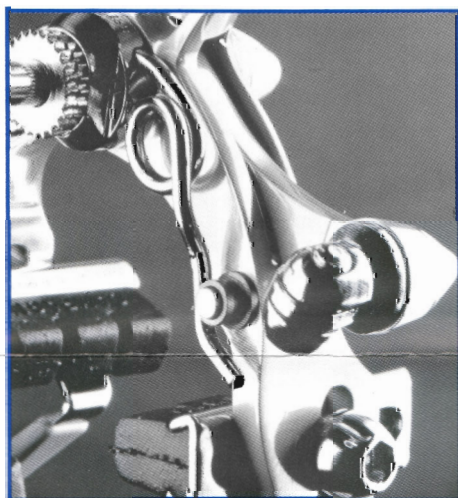
The Chorus brake levers are identical to the Delta levers and can be used with the cables run in the traditional open loop, through the handlebars or under the handlebar tape. Cables routed through the handlebars are pulled by the steel carrier plate -- a patented system -- in the lever. They are not bent or dragged and move in unison with the carrier, avoiding fraying and failure. All Campagnolo





brake cables are counter-wound and pre-stretched for easy installation and long life. The cable casings are flat wound and Teflon-lined for smooth action.

The quick-release mechanism lies in the lever. The quick-release button allows the lever to rotate further, feeding more cable to the brake so it can open wider. The lever opens approximately 12 mm more in the released position, but the amount the lever must be drawn to the handlebar during braking does not change. With the release activated, the maximum travel point of the lever is unchanged and the lever will not bottom out

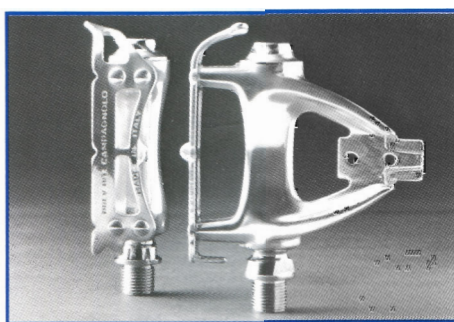


against the handlebar.

Locating the quick-release button on the brake lever also allows a rider's hand to remain on the handlebars while opening the calipers.

The brake shoes are the standard Campagnolo pads that have been constantly tested in races like the Tour de France, Giro d'Italia, Paris-Roubaix and Coors Classic. The design criteria are as follows:

1. An unnecessarily high friction coefficient is avoided to reduce the chance of lock-up and overheating on dry pavement.
2. The friction coefficient is as high as possible for predictable performance on wet roads.
3. Extended wear characteristics give a predictable life expectancy no matter what the road surface.
4. Consistent and predictable performance continues even as the pads wear from use.



## Chorus Pedals

The Chorus pedals are based on the same thorough research in ergonomic balance done for the C-Record pedals. The result provides better balance as the foot moves through a stroke of the pedal. Campagnolo engineers combined ergonomic and functional criteria to increase the pedal's efficiency.

The pedal's general shape follows the shape of the foot for a more natural line of support. The ergonomic cage plate accompanies the foot beyond the end of the axle to keep the ball of the foot as fully supported as possible, thus reducing any chance that the foot could slide off the pedal. The cage plate has a pick-up tab on its back side to help rotate the pedal to insert the foot into toe clips and straps. Areas that are often sharp edges on a cage



plate have been rounded a bit to reduce unnecessary pressure on the foot.

The axle-support collar area (the area just beyond the crank mounting threads) was found to be the biggest loss of stroke force when pedaling and has been enlarged to provide a 50 percent increase in contact area at the pedal/crankarm juncture to eliminate flex at this point. The steel axles are hardened and tempered.

The toeclips are available in three sizes, each with 25 mm fore and aft adjustment. The toe straps are leather with stainless steel buckles. Screw-on end tabs are included.

All the internal axle parts are interchangeable with Nuovo Victory and Nuovo Record parts.

## Chorus Hubs

The hubs, which follow the standard Campagnolo hub profile, are available in 32 and 36 holes with either standard five- or six-speed axles. All come with the patented Campagnolo quick release design.

The bearings are supplied in matched sets with a .001 mm tolerance. The cones and races are all rotary ground and polished to properly utilize these high precision bearings. The dust caps have grease injection holes so that new 02-ZPT grease can be added without a full overhaul.

The axles, cones, nuts, washers, bearings and quick releases are interchangeable with the Nuovo Victory hubs.

## Chorus Seatpost

The Chorus seatposts feature the slim-line profile of the C-Record seatpost. The cage is designed for seats using rails with 4 mm diameter, and the cradle for the seat can be adjusted in 2 degree increments using a 6 mm allen bolt.

The seatposts come in both 130 mm and 180 mm lengths -- the 130 mm for frames smaller than 49.5 cm, and the 180 mm seatpost for 50 cm and larger frames.

# Campagnolo Dealer Survey

This survey is designed to help both Campagnolo and the American dealer. It gives Campagnolo the chance to review the constantly changing retail market through your expertise.

We ask that you take a couple minutes to fill this survey out and return to:

Campagnolo Corporation  
43 Fairfield Place  
West Caldwell, NJ 07006

- 1) You consider your shop to be aimed mostly at what type of customer?  
☐ a) family  
☐ b) sport riders, mid price  
☐ c) professional equipment, high-end
- 2) Where are your retail goals?  
 Explain: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- 3) What percentage of your bike sales are in these price ranges?  
☐ a) up - \$500  
☐ b) \$501 - \$650  
☐ c) \$651 - \$800  
☐ d) \$801 - \$1000  
☐ e) \$1001 - \$1800  
☐ f) \$1800 - over
- 4) What are your best selling bicycle lines?  
 a) \_\_\_\_\_  
 b) \_\_\_\_\_  
 c) \_\_\_\_\_  
 d) \_\_\_\_\_
- 5) Do you sell any hand built custom frames or complete bicycles?  
 \_\_\_\_\_  
 \_\_\_\_\_
- 6) When purchasing pro quality bicycles, what do you prefer?  
☐ a) complete bicycle (already built)  
☐ b) kit form  
☐ c) frame only  
☐ d) other
- 7) Do you stock Campagnolo in:  
☐ a) complete gruppo  
☐ b) Individual parts  
☐ c) repair parts  
☐ d) small parts to service individual parts
- 8) What percentage of your aftermarket business is in Campagnolo components?  
 \_\_\_\_\_  
 \_\_\_\_\_

- 9) What specific areas of the bicycle business are fastest growing for you?  
☐ a) road or triathlon  
☐ b) ATB  
☐ c) road racing  
☐ d) track  
☐ e) other
- 10) From whom do you buy most of your Campagnolo products?  
 a) \_\_\_\_\_  
 b) \_\_\_\_\_  
 c) \_\_\_\_\_
- 11) Which distributor gives the best service in ?  
 Overall service \_\_\_\_\_  
 Small parts availability \_\_\_\_\_  
 Technical assistance \_\_\_\_\_  
 Warranty \_\_\_\_\_
- 12) Do you feel confident in your knowledge to sell the following Campagnolo products (sufficient information about product)?  

	yes	no
Rims	_____	_____
Disc Wheels	_____	_____
Tools	_____	_____
Lubricants	_____	_____
Groups	_____	_____
Water Bottles	_____	_____
Syncro	_____	_____
- 13) How can our distributors improve the above services to you?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
- 14) What kind of promotional items would be useful in your shop?  
 \_\_\_\_\_  
 \_\_\_\_\_
- 15) How would you rate our advertising as?  
☐ a) very good/excellent  
☐ b) good  
☐ c) average  
☐ d) poor
- 16) Would you like to see some changes in our advertising?  
☐ a) yes, please explain: \_\_\_\_\_  
 \_\_\_\_\_  
☐ b) no

Tear along this dotted line.



# Campagnolo Dealer Survey

17) What kinds of products would you like to see Campagnolo produce in the future?

- a) \_\_\_\_\_  
 b) \_\_\_\_\_  
 c) \_\_\_\_\_

18) In the following categories, please list the brands you prefer to stock and sell:

Freewheel: \_\_\_\_\_

Chains: \_\_\_\_\_

Spokes: \_\_\_\_\_

Handlebars: \_\_\_\_\_

Stems: \_\_\_\_\_

19) Does your shop have a Campagnolo tool Kit?

- \_\_\_\_\_ a) yes  
 \_\_\_\_\_ b) no

20) Do you prepare frames with Campagnolo tools regularly?

- \_\_\_\_\_ a) yes  
 \_\_\_\_\_ b) no

21) Do you check the frame alignment as a routine part of setting up and servicing the frame?

- \_\_\_\_\_ a) yes  
 \_\_\_\_\_ b) no

22) Have you ever attended a Campagnolo Technical Seminar?

- \_\_\_\_\_ a) yes  
 \_\_\_\_\_ b) no

23) Would you like to attend a Campagnolo Technical Seminar?

- \_\_\_\_\_ a) yes  
 \_\_\_\_\_ b) no

24) What is the best month/day of the week/time for you to attend a full day Technical Seminal?

\_\_\_\_\_

**Shop Name:** \_\_\_\_\_

**Manager:** \_\_\_\_\_

**Mailing Address:** \_\_\_\_\_

\_\_\_\_\_

**Phone Number:** \_\_\_\_\_

\_\_\_\_\_

Please fold along this line and staple shut.

Place  
stamp  
here.

**Campagnolo Corporation**  
**43 Fairfield Place**  
**West Caldwell, NJ 07006**

## CAMPAGNOLO INFO:

Call: 1-800-US-CAMPI

10:00 a.m. - 12:00 p.m.

2:00 - 4:00 p.m. E.S.T.



# Campagnolo Equipped Bikes Dominate!

The 1987 Racing Season is only half over and already Campagnolo C-Record bicycles have cleaned up.

Whether the competition is Professional, Amateur, or Triathlon, if it required a bicycle the winners bike was armed with Campagnolo Record components. If the race was a time trial the general consensus was if you didn't have Campagnolo Fluid Dynamic Disc Wheels you might as well have not shown up.

For the third straight year a C-Record equipped bicycle has won the Race Across America, the worlds longest time trial. When asked about the performance of his C-Record Kestral, Mike Seacrest said, "Absolutely no problems, it worked perfectly". Campagnolo equipped bicycles have dominated American races this year. In the National Championships, C-Record equipped bikes won the top 5 places in the individual time trials, first and second in the 100km Team Trial, first and second in the Mens Road Race, first place in the Womens Road Race, and first and second in the Match Sprint competition!

In triathlon competition, Campagnolo riders Mike Pigg and Harold Robinson are currently first and second overall in the Bud Lite/USTS series for Pro triathletes and the rest of their Cool Max/NTTC teammates have ridden Campagnolo equipped bikes to numerous victories as well.

In Europe the beat goes on with 37 out of 44 pro teams selecting Campagnolo to equip their machines. And talk about victories, Campagnolo bikes have won everything in sight including Paris-Roubaix, Milan-San Remo, Liege-Bastogne-Liege, Ghent-Wevelgem, Het Volk, Amstel Gold Race, Tirreno-Adriatico, Rotta de La Sol, and first through ninth place in The Giro d'Italia. At the time of this writing the yellow jersey of the Tour de France has changed hands 5 times but one thing has remained the same - The Campagnolo components on the leaders bike. And what about Greg Lemond? Unfortunately Greg's team must use another brand of equipment but the Team Lemond bicycles that bear his name are equipped exclusively with Campagnolo at his request.



Stephen Roche at the 70th Giro d'Italia.

## • NEWS • FLASH •

Stephen Roche has just made cycling history by winning both the 1987 "Tour de France" and the 1987 "Giro d'Italia".  
His components, Campagnolo, of course!!



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West Caldwell, NJ 07006

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