FRAME BUILDING MATERIALS

| ${ }_{\text {Recommeneded }}^{\text {Use }}$ |  |  | touring | club racing | $\underset{\text { Stingle }}{\text { Stager. }}$ |  | ULIMETRAIAL | track ṘACII |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Article | Speefificaion | Speeificaraion | Speafification | Speefification | Speafifatation | Speeification | Speatifation |  |
| Cranks | ${ }_{\text {M }}^{\text {M }}$ |  | ${ }_{\text {w } 1500^{\text {a }} \text { 'Criterium }}$ |  | competizion' | 'Criterium ${ }^{\text {Re }}$ |  |  |
| Chainwheel |  | $\begin{aligned} & \text { T.A. } \\ & 2205 \text { 'Criterium' } \\ & \text { double } \end{aligned}$ |  |  | $\xrightarrow{\text { zeus }}$ Double | ${ }^{\text {Criterefium }}$ Iouble | ${ }_{205}{ }^{\text {T Singing }}$ | ${ }_{\text {P243 S Single }}^{\text {T. }}$ |
| Pedals | M! M Camem |  |  |  | 'Super Compeitition' | ${ }^{\text {Gran Soort }}$ | ${ }_{\text {a }}^{\text {a }}$ LTOTRAR dural | ${ }_{\text {zems }}^{\text {Pistad }}$ |
| Handelear Stems | MIMEEMOI |  | MIMREMOO | MIMREMOO | ${ }^{\text {GTant Prix' }}$ | 1/A forsed dural | Record | ${ }^{\text {Aviont }}$ Chor |
| Handelear |  | MMLLEMO, | $\underset{\substack{\text { MiLREMO } \\ \text { Randoneur }}}{\text { and }}$ |  | , GTrar Prix' | cinele |  | ${ }_{\text {chrome Track }}^{\text {THAT }}$ |
| Handebar Tape |  | MMLLEENO | MMLLEEMO |  | $\frac{\text { MM.REMO }}{\text { Twiolux }}$ | MMLLEMO: | MMLREMO, | Mil Remo |
| Handleara Plugs |  | MALLEEMO | MMAREM | MILREM ${ }_{\text {Stro }}$ |  | M. Militen | M. ${ }_{\text {M }}^{\text {STILEMO }}$ | Mil Remo |
| Brakes | ${ }_{59} \mathrm{LIAM}$ Chrome |  |  | witicm-Racer 'cp | $\xrightarrow{\text { 2FUS }}$ Aft |  |  |  |
| Cable Clips | $\underset{\substack{\text { MLIREMO/REG } \\ \text { plasic }}}{\text { che }}$ | MLLREMOOREG | MILREMO/REG plastic | $\begin{aligned} & \text { MLLREMOOMREG } \\ & \hline \text { pastic } \end{aligned}$ | ${ }_{\substack{\text { MILREMO/REG } \\ \text { pastic }}}^{\text {ceic }}$ | ${ }_{\text {MLLREMO/REG }}^{\text {pasaic }}$ |  | - |
| Sadde | SANMABCO | ${ }^{\text {M1/REME }}$ Super |  | ANOUETIL | goideate | $\xrightarrow{\text { IOEALE }}$ gosc dura | ${ }^{\text {Campuione }}$ With We clip | ${ }_{\text {Standarde }}$ With with |
| Pump | ${ }^{\text {MILREM }}$ Clilu |  | ${ }_{\text {No. }}^{\text {R } 9 \text { plastic }}$ | ${ }_{\text {No. } 9 \text { plastic }}^{\text {Reg }}$ |  |  | ${ }_{\text {No. } 8 \text { p plastic }}^{\text {Reg }}$ | - |
| Pump Holder | M. T Tenemi | MIL Reme | M.LREMOM | MILREMEMO |  | ${ }_{\text {plastic cup }}^{\text {peg }}$ | ${ }_{\text {plasic }}^{\text {Reg }}$ cup | - |
| Front Changer | - |  | $\xrightarrow{\text { HUREET }} 70$ | - | Criterius 69 | Criterium 69 | - | - |
| Rear Gear |  | ${ }_{\text {chem }}^{\text {TRIPLEX }}$ Sport | 2100sT Super Touring |  | $\begin{gathered} \text { ZEUS } \\ \text { 'Criterium 69' } \end{gathered}$ | $\begin{gathered} \text { ZEUS } \\ \text { 'Criterium 69' } \end{gathered}$ | Spiplex |  |
| Freewheel | MILREMO 'All Star' 5 -spd. | MILREMO 'All Star' 5 -spd | MILREMO | MILREMO <br> 'All Star' 5 -spd | $\begin{aligned} & \text { 'MILREMO } \\ & \text { 'All Star' } 5 \text {-spd. } \end{aligned}$ | MILREMO 'Alpine' 5 -spd | MILREMO 'All Star' 5 -spd. | ${ }_{\text {Pista }} z_{\text {duras fixed }}$ |
| Chain | ${ }_{3 / 2}^{1 / 2 \mathrm{rac} \text { ing }}$ |  |  | ${ }_{3 / 32 \text { racing }}^{1715}$ |  | ${ }_{3 / 32 \mathrm{~N} \text { derailleur }}^{\text {Red }}$ | $\xrightarrow{3 / 32 \text { Renoterilleur }}$ | $\underbrace{\substack{\text { cxt }}}_{\text {coventar }}$ |

The very best of equipment is of no use unless it is fitted to a well designed and properly constructed lightweight frame.

Your personal preference can easily be applied with your own choice of accessories but the materials used in the construction of your frame are best left to an expert frame builder.

RON KITCHING has not neglected this most important side of the cycle trade and lightweight frame builders both large and small take advantage of his service in quality frame builders' materials

Insist on your builder using the fitments in this section, guaranteed to result, if properly brazed, in a first class frame

## INDEX

## LUGS

The vital points of any bicycle frameand the vital parts of any lugPRECISE DIMENSIONS and RIGIDITY PLEASING DESIGN and FINISH
Prime qualities of the BOCAMA


Offering an irreproachable finish and unequalled accuracy, BOCAMA Lugs are now the popular choice of all the leading British and European Cycle manufacturers.

ANGLES: These are very accurate and never vary more than a few minutes.

BORINGS: Always concentric, giving an exact regularity to the thickness of material. This exactness in the boring and concentric spindle, obtained by drawing, allows increased efficiency in brazing.

ALLOWANCES: These have been reduced to only $7 / 100$ on all steering lugs.

FINISH AND PRESENTATION:

All the lugs are delivered deoxidised and cleaned. A special operation is performed to obtain better cut-outs on the steering lugs excluding any spurs and avoiding the use of a file in preparation.

CUT-OUTS:

These are available in a large variety of designs either plain or with attractive cut-outs.

The information given in the following pages is brieffuller details and prices are available to bona fide cycle frame builders on application.

Lugs are available in a wide variety of designs and in a choice of two qualities.

Illustrated below are just a few examples of the large range of models-a full illustrated lug catalogue is available to cycle manufacturers on application.

MEN'S SPORTS QUALITY LUGS (Choice of 4 cut-out designs)
BBA/250
Men's Top Head Lug
Design No. 12
Pattern I
BBA/250
Men's Top Head Lug
Design No. 14
Pattern I
BBA/260
Men's Bottom Head Lug
Design No. 12
Pattern 1
BBA/401
Men's Seat Lug
Design No.
Pattern 1
P(Scalloped top)


BBA/408
Men's Seat Lug
Design No. 1
Pattern II
deluxe cut-out
S-Scalloped top with spigot


## BBA/450

Decorative
ring

BBA/235
French Twin
Tube Open Frame Sea
Tube lug Tube lug


## WOMEN'S LUGS

Same cut-out designs are available as Men's


## BBA/215

English loop frame intermediate Pattern II de luxe cut-out
BBA/105
Top head lug Pattern II de luxe cut-out Design No. 81

BOCAMA introduce the
B.C.M.

PROFESSIONAL RACING LUG SET
Here at last is the perfect lug set for the racer-light-accurate and with a clean simple cut-out design. Made in the famous BOCAMA tradition of concentric borings, reduced allowances, superior finish, the B.C.M. Professional must surely be your choice for that new frame. Available in all popular racing angles.


BBA/1000 Men's Top Head Lug Professional



BBA/1005
Men's Bottom Head Lug Professional

## METHOD OF MEASURING ANGLES OF FRAME LUGS



PARALLEL FRAME

$A=$ the lug angle.

Please be sure when enquiring or ordering to state not only the angle but also the following information:
(1) Lug Design number.
(2) Whether for MEN'S or WOMEN'S cycle.
(3) Catalogue reference number.


The resulting product allows the manufacture of frames

## COLUMBUS

 TUBINGThe present high quality level of COLUMBUS tubing is due to the use of special alloy steel of the best European classification allied to the most modern processes and treatments in manufacture with the most up-to-date technology.
particularly suitable for modern cycle racing.
The numerous victories of such famous champions as ADORNI, MERCKX, GIMONDI, DANCELLI. ALTIG, BEGHETTO, etc. confirm the present day superiority of COLUMBUS tubing.


## DURIFORT

Steering columns are available either plain or fully threaded—dia. 25.4 mm (1") for stems of 22.2 mm butted to $25 / 10 \mathrm{~mm}$ (16/13 gauge).

FORGED STEEL
MODELS


## FORK CROWNS

Made in two types-forged steel with unrivalled stylestrength—finish for high class racing cycles and pressed and welded steel for popular cycles
 The fork crowns with cut-away slopes are recommended to firms utilising
automatic brazing, the double slope permitting perfect cooling of the braz-
zells

FORK ENDS are available in two qualities both with gear hanger suitable for CRITERIUM 69 gear or similar.

Mudguard eyes are fitted to both models-front and rear.


GRAN SPORT

Model GRAN SPORT ends are forged with spring loaded adjusters incorporated in the rear.


## MILREMO

The Miracle Marque manufacturer makes frame building easier.
Here are illustrated some of their quality products.

## BRACKET SHELLS

A choice of 5 different cut-outs are available.

## BNO/2 TRIDENT

Popular cut-out.
Alternative cut-outs
BMO/1 Plain.
BMO/3 Italien.
BMO/4 Duck's nose.
BMO/10 Eagle's nose.


FORK CROWNS

5 Models to suit the most fastidious rider whether he requires a two-plate solid forged track model or the Italian fully sloping road pattern.

BMO/2000 PISTA
BMO/2005 SUPER CORSA
BMO/2010 CORSA 'A'
BMO/2020 CORSA 'B'
BMO/2030 GIRO 'A'


C'EST MAGNIFIQue C'EST MILREMO



65

## BRAZING PARTS

MILREMO make scores of small pieces for every possible frame attachment so avoiding the need to fit useless and weighty clips.
Only a few are illustrated here-samples are available to your builder upon application. We can always make parts to your pattern.


500


300


200


273


700

BRAZING PARTS



| Catalogue Ref No. | Description |
| :---: | :---: |
| $\begin{aligned} & \mathrm{BBA} / 280 \\ & \mathrm{BBA} / 285 \end{aligned}$ | WOMEN'S SPORTS DESIGNS—Nos. 14-16 |
| $\begin{aligned} & \mathrm{BBA} / 290 \\ & \mathrm{BBA} / 295 \end{aligned}$ |  |
| BBA/300 BBA/305 |  |
| BBA/320 | French Twin-Tube Top Head Lugs <br> Angles available <br> Type ' $D$ ' only <br> Bore: $31.75 \times 13 \times 13 \mathrm{~mm}$ |
| BBA/330 | French Twin-Tube Bottom Head Lugs <br> Type 'D' only <br> Angles and Bore as for Top Head Lug <br> MEN'S SEAT LUGS |
| BBA/400 <br> BBA/401 <br> BBA/402 <br> BBA/403 |  |
| $\begin{aligned} & \mathrm{BBA} / 405 \\ & \mathrm{BBA} / 406 \\ & \mathrm{BBA} / 407 \\ & \mathrm{BBA} / 408 \end{aligned}$ |  <br> Angles and Bore as for Pattern I <br> WOMEN'S SEAT LUGS |
| BBA/420 <br> BBA/421 <br> BBA/422 <br> BBA/423 | TYPE |
| $\begin{aligned} & \mathrm{BBA} / 425 \\ & \mathrm{BBA} / 426 \\ & \mathrm{BBA} / 427 \\ & \mathrm{BBA} / 428 \end{aligned}$ | Pattern <br> $\mathrm{V} \quad$ As above <br> Bore: 28.6 mm <br> Z |
| BBA/450 | Decorative Rings $\quad$ Bore: 31.75 mmor 33 mm |
|  | CAMPAGNOLO |
| $\begin{aligned} & \mathrm{BCO} / 50 \\ & \mathrm{BCO} / 51 \end{aligned}$ | Cable Stops and Tunnels <br> 621 Braze on cable stop <br> 663 |


| Catalogue Ref No. | Description |
| :---: | :---: |
|  | Fork Ends CAMPAGNOLO-continued |
| BCO/100 | 1010 Record Road ends complete with guard bolts and adjusters |
| BCO/101 | 2 Record front end only L.H. or R.H. |
| BCO/102 | 300 Record L.H. rear end only |
| BCO/103 | 301 Record R.H. ," ,", |
| BCO/110 | 1060 Corsa vertical dropouts |
| BCO/111 | 1061 , L.H. vertical dropouts |
| BCO/112 | 1062 ", R.H. ", ", with hanger |
| BCO/113 | 1063 ,, Front fork end L.H. or R.H. |
| BCO/120 | 1053 Pista heavy plate track ends |
| BCO/121 | 664 ,, rear end L.H. or R.H. |
| BCO/122 | 665 ,, front ,, ,, ," ," |
|  | Gear Lever Boss |
| BCO/150 | 660 for down tube Record lever L.H. or R.H. |
|  | CINELLI |
|  | Fork Crowns-solid forged (for Columbus fork blades) |
| BCI/100 | CORSA-shallow slope |
| $\mathrm{BCl} / 101$ | SUPER CORSA-full sloping shoulder |
|  | COLUMBUS |
|  | Frame Tubing |
|  | Butted Tube Sets complete with 3 main tubes, 2 fork blades, 2 chainstays, 2 seat stays, 1 head tube and 1 steering column |
| BCS/800 | No. 1 Type SP Butted 0.71 mm for Road $(2.375 \mathrm{Kg})$ |
| BCS/801 | No. 2 ", SL ", 0.609 mm ,", ${ }^{\text {a }}$ ( 2.065 Kg ) |
| BCS/802 | No. 3 , PS, , 0.71 mm ,, Track ( 2.435 Kg ) |
| BCS/803 | No. 4 ,, PL ,, 0.6 mm ,, Pursuit and T.T.S ( 1.830 Kg ) |
|  | DURIFORT |
|  | Steering Columns-Fully threaded-1" dia. 16/13 gauge |
| BDT/700 | . Length $7 \frac{1}{2}$ ", |
| BDT/701 |  |
| BDT/702 | " 9 93 ${ }^{\text {en }}$,', |
| BDT/703 | 912." |
| $\begin{aligned} & \text { BDT/704 } \\ & \text { BDT/705 } \end{aligned}$ | ", $12{ }^{\frac{11}{11}{ }^{\prime \prime}}$ |
| /B | Reduction not threaded |
|  | MILREMO |
| Bracket Shells British Specification: |  |
|  | Head Tube Seat Tube Chainstays |
| Diameters | 28.6 mm . 28.6 mm . 22.2 mm or 20.0 mm |
|  | Front Rear (Between head and seat tube) (Between seat tube and chainstays) |
| Angles | Men's $60^{\circ}-67^{\circ}$ $60^{\circ}-65^{\circ}$ <br> Women's $94^{\circ}-96^{\circ}$ $60^{\circ}-62^{\circ}$ |
| Chainstays | Parallel for cranked chainstays |
|  | or Divergent for straight chainstays |
| Width | 66 to 70 mm to order |
| Threading | British $\phi 34.7 \times 24$ TPI |
| Cut-outs | Choice of 5 models (see illustrations) |


| Catalogue Ref No. | Description |
| :---: | :---: |
|  | MILREMO-continued <br> Plain—For parallel chainstays only. Models also available for collapsible cycles and welded frames. |
| BMO/1 |  |
| BMO/2 | cycles and welded frames. <br> Trident |
| BMO/3 | Italien |
| BMO/4 | Duck's nose |
| BMO/10 | Eagle's nose |
|  | Brake Cable Stops and Clips |
| BMO/251 | Single cable |
| BMO/256 | Double Single cable guide and stop |
| BMO/273 | Single cable guide and stop |
| BMO/275 | Single bräke cable clíp " |
| $\mathrm{BMO} / 450$ $\mathrm{BMO} / 455$ |  |
| BMO/455 | Double " ," " |
| BMO/600 | Brake Pivot with threaded stud |
|  | Bridge Pieces (with welded seam or seamless) |
|  | Straight Pattern |
| $\begin{aligned} & \mathrm{BMO} / 700 \\ & \mathrm{BMO} / 701 \end{aligned}$ | With 5 mm dia. hole-length, top 16 mm , bottom 16.5 mm |
|  | (To order Straight Bridges can be supplied from 12 to 14 mm dia. drilled horizontally or vertically up to 120 mm long) |
|  | Curved Pattern |
| BMO/750 | 12 to 14 mm dia. drilled horizontally or vertically, or undrilled With seat tube clearance undrilled, 12 mm dia. length, top $53-59 \mathrm{~mm}$, bottom $56-61 \mathrm{~mm}$ |
| BMO/753 |  |
| BMO/1148 | Bridge Strengthening Pieces-12 mm dia. |
|  | Cable Tunnels |
| $\begin{aligned} & \mathrm{BMO} / 540 \\ & \mathrm{BMO} / 545 \end{aligned}$ | $\begin{array}{cc}\text { Single- } 45^{\circ} & \text { (Front) } \\ , \quad-90^{\circ} & \text { (Rear) }\end{array}$ |
|  | Chain Rest |
| BMO/500 | Chainstay fitting |
| BMO/560 | Clip Stop for Gear Lever |
|  | Collapsible Bicycle Tube (Patented system) |
| BMO/3050 | Diameter of tube 35 mm -gauge 20/10 |
|  | Dynamo Brackets |
| BMO/50 | Short reach straight Gauge 20/10 |
| $\mathrm{BMO} / 75$ $\mathrm{BMO} / 55$ | Long " ", ", 25/10 |
| $\mathrm{BMO} / 55$ $\mathrm{BMO} / 60$ | Long ", cranked $\quad$,", $20 / 10$ ,", |
| BMO/65 | ", ", ", "-larger 20/10 |
| BMO/70 | Medium ," curved arm ", 20/10 |
| BMO/80 | Long ", cranked $\quad$, 25/10 |
| BMO/200 | Dynamo Cable Tunnel |


| Catalogue Ref No. | Description |
| :---: | :---: |
|  | MILREMO-continued <br> Fork Crowns (Drilled for 25.4 mm dia. fork column) $\qquad$ |
|  |  |
| BMO/2000 | Pista-Two plate solid forged track for round blades $22-2$ dia. Super Corsa-solid forged with Italian style fully sloping shoulders and with internal legs for oval blades $29 \times 16 \mathrm{~mm}$ dia. |
| BMO/2005 |  |
| BMO/2010 | Corsa A-shallow slope with slotted cut-outs and short spearpoint sides for oval blades $29.0 \times 16 \mathrm{~mm}$ dia. |
| BMO/2020 | Corsa B—shallow slope with cut-outs and point for inner side of fork blade for oval blades $29.0 \times 16$ mm dia. |
| BMO/2030 | Giro A-flat top crown with cut-outs and short spearpoint sides for oval blades $29.0 \times 16 \mathrm{~mm}$ dia. |
|  | Frame Hinges |
| BMO/3068 | Juvenile steel pin, chrome clamp and lever screw |
| BMO/3074 | "," ", ", galvanised pressed steel clamp with alloy lever |
| $\mathrm{BMO} / 3075$ $\mathrm{BMO} / 3079$ |  |
|  | Adult model nylon bushed hinge pin galvanised pressed steel clamp and |
| BMO/3080 | Adult model nylon bushed hinge pin, chrome clamp and lever screw |
| BMO/4079 | ", ", steel pin galvanised pressed steel clamp with alloy lever <br> ,", ", chrome clamp and lever screw |
| BMO/4080 | Follding "'and collapsible, steel pin galvanised pressed steel clamp with alloy lever |
| BMO/5079 |  |
| BMO/5080 | Folding and collapsible steel pin chromed clamp and lever screw |
| BMO/570 | Gear Cable Stop |
|  | Gear Case and Chainguard Bracket |
| BMO/100 | Straight arm Gauge 18/10 |
| BMO/105 | Curved " with cranked end ", $18 / 180$ |
| BMO/130 | , ${ }^{\text {a }}$, with cranked end ", 18/10 |
| BMO/140 | Straight ", ", ", " ${ }^{\text {, }}$ |
| BMO/141 | Curved T ", ", " 20/10 |
| BMO/143 | Straight T ," ", " $20 / 10$ |
|  | Gear Lever BossFor 28 mm dia. tube |
| BMO/550 |  |
| BMO/555 | ,, 13 mm ,, (twin) |
| BMO/1600 | Handlebar Stem Clamping Collar with QR cam lever |
|  | Pump Pegs |
| BMO/405 | Flat Round |
| BMO/406 |  |
|  | Saddle Pin Bolt Lug |
| BMO/1000 | With threaded bolt and QR locking lever |
| BMO/1500 | Saddle Pin Clamping Collar with QR cam lever |
|  | Seat Bolt Lug |
| BMO/300 | For 28 mm Tube For 26 mm Tube |
| BMO/305 |  |
|  | Stay Bridge Reinforcing Pleces |
| BMO/1149 | 10/10 gauge with cut-out $\frac{5}{8}^{\prime \prime}$ or $9 / 10^{\prime \prime}$ dia. |


| Catalogue Ref No. | Description |
| :---: | :---: |
| BVR/320 BVR/325 BVR/330 BVR/335 | VAGNER |
|  | FORK CROWNS |
|  | Forged Steel Models |
|  | Route 66 mm or Demi-Ballon 68 mm (centre to centre) Oval pockets size $29 \times 16 \mathrm{~mm}$-column hole $25 \cdot 4 \mathrm{~mm}$ |
|  | Cut-outs-Types DP. PL. PC. DL. |
|  | " ", No. 11-12 |
|  | " ", " $\begin{aligned} & \text { No. } 12 \text { REC. } \\ & \text { DP special for automatic brazing }\end{aligned}$ |
|  | " " " DP special for automatic brazing |
|  | EXTRAS: |
| /CS | Note: Forged types available with:- |
|  | Chevrons on the shoulders EXTRA Two plate effect EXTRA |
|  | Pressed and Welded Steel Models |
|  | Cut-out Type DP only |
| $\begin{aligned} & \text { BVR/350 } \\ & \text { BVR/355 } \\ & \text { BVR/360 } \end{aligned}$ | Route $\quad 60 \times 29 \times 16 \times 25.4 \mathrm{~mm}$ |
|  | Demi-Ballon $68 \times 29 \times 16 \times 25.4 \mathrm{~mm}$ |
|  | Junior $66 \times 26 \times 14 \times 25 \mathrm{~mm}$ |
| BVR/460 BVR/4610 BVR/471 | Fork Crown Covers- $\frac{1}{2}$ depth only |
|  | Brass for forged pattern |
|  | Chrome on brass for forged pattern |
|  | Brass for pressed pattern |
|  | Chrome on brass for pressed pattern |
| $\mathrm{BZS} / 450$$\mathrm{BZS} / 451$$\mathrm{BZS} / 452$$\mathrm{BZS} / 460$$\mathrm{BZS} / 461$$\mathrm{BZS} / 462$ | ZEUS |
|  | FORK ENDS |
|  | Competition pressed front |
|  | ", $\quad \begin{aligned} & \text { pressed } \\ & \text { pressed frort } \\ & \text { frond }\end{aligned}$ |
|  | Gran S"port forged front |
|  | ,", ", forged rear with gear hanger and adjusters |

