

**BIKEMASTER User's Manual**  
By Don Axtell, 9 October, 1987

To run BIKEMASTER type the following :

RUN SDISK:[SAG.DVA.PROGRAM]BIKEMASTER.EXE

BIKEMASTER displays a list of 19 variables as shown below. Together they help to calibrate and quantify any bicycle ride so that predictions can be made on future rides. Knowing how each of these variables interact with the others, the user will become a master of his bike. To use this program, simply choose a variable and enter a new value. BIKEMASTER then automatically makes all adjustments to the other variables and updates the display. Both old and new values are shown side-by-side for ease of comparison. Each of these 19 variables is covered in the following pages.

BIKEMASTER - Learn to be the master of your bicycle				
A-Distance to ride(miles) =	1.8	1.8	1.8	0.0
B-Road gradient (percent) =	10.5	10.5	10.5	0.0
C-Elevation change (feet) =	997.9	997.9	997.9	0.0
D-Weight of bike (pounds) =	25.0	25.0	25.0	0.0
E-Weight of rider(pounds) =	180.0	180.0	180.0	0.0
F-Rolling friction =	0.01000	0.01000	0.01000	0.00000
G-Wind friction factor =	0.01621	0.01621	0.01621	0.00000
H-Wind speed (mph) =	0.0	0.0	0.0	0.0
I-Wind angle (0deg=head) =	0.0	0.0	0.0	0.0
J-Gear ratio =	43.6	43.6	43.6	0.0
K-Pace or Cadance (rpm) =	59.9	55.5	48.0	0.0
L-Speed (mph) =	7.8	7.2	6.2	0.0
M-Time (minutes) =	13.9	15.0	17.3	0.0
N-Weight load (pounds) =	21.4	21.4	21.4	0.0
O-Rolling load (pounds) =	2.0	2.0	2.0	0.0
P-Wind load (pounds) =	1.0	0.8	0.6	0.0
Q-Total load (pounds) =	24.4	24.3	24.1	0.0
R-Work (pound_miles) =	44.0	43.7	43.3	0.0
S-Power(pound_miles/hour) =	189.8	174.9	150.0	0.0
Enter Item, Value :				

**A - DISTANCE (In miles) :**

Distance is how long the ride is or will be. A long trip should be broken down into sections, with each section having a constant Gradient (B). Only one section can be considered at a time. A change in Distance will affect Elevation (C), Time (M), and Work (R).

**B - GRADIENT (In percent) :**

Gradient is a measure of how much uphill (+) or downhill (-) slope there is on the ride section considered. Gradient is defined as the number of vertical feet change for each 100 feet of horizontal. Gradients greater than 10 are very steep hills. A change of Gradient will affect Elevation (C), Cadance (K), Speed (L), Time (M), Weight load (N), Wind load (P), Total load (Q), and Work (R). If the change in Gradient causes a Speed (L) greater than 35 mph, then Speed is set to 35 and Power (S) is changed.

**C - ELEVATION (in feet) :**

Elevation is the vertical change from the beginning to the end of the ride section. Positive Elevation is uphill. When Elevation is changed, Gradient (B) is recalculated, and then all other changes are based on the new Gradient.

**D - BIKE WEIGHT (In pounds) :**

Bike weight is the weight of the bicycle plus any additional equipment. A change in Bike weight affects Cadance (K), Speed (L), Time (M), Rolling load (O), Weight load (N), Total load (Q), and Work (R).

**E - RIDER WEIGHT (In pounds) :**

Rider weight is combined with Bike weight (D) to get the total weight. A change in Rider weight affects Cadance (K), Speed (L), Time (M), Rolling load (O), Weight load (N), Total load (Q), and Work (R).

**F - ROLLING FRICTION (unitless) :**

Rolling friction is a factor which is multiplied by the total weight (D+E), which results in Rolling load (O). A change in Rolling friction affects Cadance (K), Speed (L), Time (M), Rolling load (O), Total load (Q), and Work (R). Appropriate values for Rolling friction are :

TIRE SIZE / ROAD CONDITION	ROLLING FRICTION
Thin tire / Smooth road	.010
Thin tire / Rough road	.020
Fat tire / Smooth road	.020
Fat tire / Rough road	.025
Fat tire / Loose dirt	.040