



HP41CX Program Listing

Title:	Bicycle gearing
Program Label:	LBL "GEAR" / 73 bytes
Version:	1.0
Date:	24/12/1990

Description

Calculates the inch gear equivalent for a given chain ring, sprocket size and Sachs Torpedo Pentasport hub ratio for my Moulton AM bicycle. I fitted the Pentasport to an AM2 and have been very pleased with it. The program works equally well for bikes without a hub.

The program assumes Moulton 17" wheels but you can change the figure for any wheel. The diameter (in inches) is measured from actual rolling circumference, including tyre compression with normal load. See line 13 of the listing below.

Core Logic

The basic equation for the determination of a gear ratio is:

$$\frac{\text{No. of teeth on chain ring}}{\text{No. of teeth on sprocket}} \times \text{Wheel Diameter} = \text{Gear ratio}$$

Additionally, provision is made for the 5 ratios available in the hub:

$$\frac{\text{No. of teeth on chain ring}}{\text{No. of teeth on sprocket} \times 1/\text{hub}} \times \text{Wheel Diameter} = \text{Gear ratio}$$

Execution

Just enter the appropriate numbers after the prompts and touch **R/S** after each one.

The available hub ratios in the 5 speed Pentasport hub are as follows:

0.67	1st
0.78	2nd
1	3rd
1.28	4th
1.5	5th

Enter one of these according to the gear you need to calculate.

A 20in gear is very low for hill climbing
An 80in gear is the average for cruising on the flat.

Currently the AM is fitted with a 52t chain ring and a 17t sprocket to give a range of:
34.4 to 77.1in as calculated by this program - a reasonable range for a road bike (and my fitness...).



Line	Instruction	Comments
1	LBL "GEAR"	
2	FIX 1	
3	"CHAIN RING?"	Chain ring size? (Enter No. of teeth)
4	PROMPT	
5	ENTER^	
6	"SPROCKET?"	Sprocket size? (Enter No. of teeth)
7	PROMPT	
8	"HUB RATIO?"	Pentasport ratio? If you don't have a hub gear enter 1
9	PROMPT	
10	1/X	
11	*	
12	÷	
13	16.8	Assumed wheel size in inches taking into account tyre compression
14	*	
15	CLA	
16	ARCL X	
17	APPEND: " IN"	
18	PROMPT	Result in inches.
19	↑ GTO "GEAR"	Loop back for another run.
20	END	

Further information

See Richard's New Bicycle Book for further details on gearing:
Richard Ballantine, ISBN 03303 31315, Pan.

There is also a wealth of information on every aspect of cycling by a real enthusiast.

For more HP41CX programs, visit <<http://www.inventors-emporium.co.uk>>

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