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VOLUME 4
NUMBER 3

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COCO & MODELS III & 4,
TI-99/4A

24 AT-A-GLANCE
SOFTWARE REVIEWS



FAMILY COMPUTING

FEATURES

25 BUYER'S GUIDE TO IBM-COMPATIBLE COMPUTERS

by Phil Wiswell

Examine the widening world of IBM PC "look-alikes" and "work-alikes" for home use from manufacturers like Tandy, AT&T, Sanyo, Wang, and Compaq. PLUS: HIGH-POWERED SOFTWARE—THE MAIN REASON TO THINK IBM

30 GET ORGANIZED FOR GOOD WITH DATA-BASE SOFTWARE

by Steve Morgenstern

Create a computerized file cabinet that places information at your fingertips, and transfer a home full of data to disk.

PLUS: CHOOSING YOUR DATA BASE

36 LAST CHANCE TO WIN! COMPUTING FAMILY OF THE YEAR CONTEST

Enter now! It's the last month to enter our second annual contest. You could win a complete computer system, peripherals, software, and much more.

37 FROM HALLEY'S COMET TO THE STARS

by Robin Raskin

With astronomy software, your computer becomes a planetarium. Simulate the night sky on-screen.

40 HANDS ON: BUILD A "HOME-BREWED" LOGIC PROBE

by Henry F. Beechhold

Read the schematic, collect the tools, and find out how to build a probe to test the "smarts" of your computer yourself.

42 HELPFUL HINTS

K-POWER

73 Classroom Adventures: From Werewolves to Math Tests

Students in Massachusetts learn map-making, language skills and more, while playing computer games at school.

74 Game Strategies

Your mission: to find the treasures of the Kingdom of Davenport and return them to the king; the Strategy map guides you.

76 Microtones

Armchair Arranger shows you how to arrange a modern-sounding song, complete with bass line.

78 Compuopia

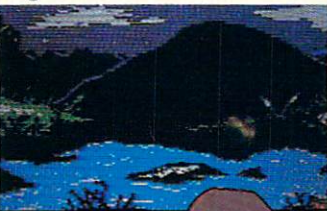
Boxes draws three-dimensional figures on your computer screen. For Apple II series & Macintosh, Atari, and IBM PC & compatibles.

78 Contest

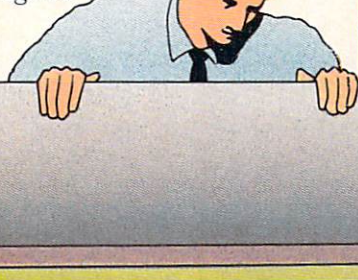
Laugh it up with computer jargon in the Ludicrous Lingo Contest.

COVER PHOTOGRAPH BY NEIL SLAVIN

Page 90



Page 30



PROGRAMMING

51 THE PROGRAMMER

52 BEGINNER PROGRAM

Weight on Other Planets lets you see how much an object weighs on the moon or on any planet in our solar system. For Adam, Apple II series & Macintosh, Atari, C 64/128 & VIC-20, IBM PC & compatibles, Tandy CoCo & Models III & 4, and TI-99/4A.

60 EDUCATIONAL PROGRAM

Sharpen math skills and have fun to "boot" with *Multimath*. For Apple II series & Macintosh, Atari, C 64/128 & VIC-20, IBM PC & compatibles, and Tandy CoCo & Models III & 4.

65 TIPS TO THE TYPIST

66 GAME PROGRAM

by Brian Flynn

Lead a merry chase with *Fox and Geese*, an intriguing two-player game. Now it's a program for Apple II series computers.

WHAT'S IN STORE

80 NEW HARDWARE

82 SOFTWARE GUIDE AND REVIEWS

Twenty-four new and noteworthy programs.

Page 73



DEPARTMENTS

4 EDITOR'S NOTE

6 LETTERS

8 HOME-SCHOOL CONNECTION

by Diana Salyers

Make homework fun with FAMILY COMPUTING's original *Drill & Practice* program. Tailor the program to your child's needs and skill level, and watch the results!

12 WORKING AT HOME

by Bill Toohey

Increase the effectiveness of your job search by using your computer.

PLUS: SAMPLE FILE PRINTOUT

16 TELECOMPUTING

by Nick Sullivan

Investigate communications software that really works. Check out the features of *ASCII Express*, *SoftCall*, *HomePak*, *Smartcom II*, and *Vidtex*.

20 GAMES

by James Delson

Start your own playtesting group to rate new computer games. Our own games reviewer explains how to plan sessions, make up a guest list, and track results.

23 COMPUTING CLINIC

94 CLASSIFIEDS

96 ADVERTISERS' INDEX

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6 FAMILY COMPUTING

LETTERS

SHOCKING SUGGESTIONS

Thank you for the warning about static electricity (*Computing Clinic*, page 25) in the December 1985 issue. I recently touched the joystick on my Apple IIe while the computer was turned on and damaged a chip. The computer is now in the shop having the chip replaced. Thank you for the great magazine.

BRENT BOXWELL
El Paso, Texas

In the article, "How to Keep Your Computer Healthy" (page 41, January 1986), the procedure outlined for the older "two-prong" convenience outlet works fine if the electrical system is of metallic raceway (conduit).

However, if the system is of ungrounded nonmetallic sheathed cable (Romex) or improperly installed metallic armored cable (BX), there would be no "ground path" or a high-resistance "ground path." In newer electrical systems, grounded Romex is the norm and the described system should function. In some areas, it is permissible to run an insulated conductor from a convenience outlet to a metallic cold-water line to achieve an acceptable ground. This method of grounding would allow the use of the scheme outlined in the article. As a licensed electrician, I would like to compliment the author of the article on recommending that power to the outlet be disconnected before starting any modifications.

RICHARD J. ANTI
Mulberry, Florida

BEST ADAM SOURCE

Thanks a lot! Your magazine is probably one of the best Adam resources that can be found. I've owned a Coleco Adam since it first came out, and I was one of the lucky few who hasn't had any problems with it. I'm quite an advanced computer user, as I use the TRS-80 and IBM PC every day in school.

ROSS GRAFFMAN
Orrington, Maine

TOE-TAPPING PROGRAMS

I'd like to tell you what a fine magazine you publish. It's fantastic! I particularly look forward to Microtones and The Programmer, and I also enjoy K-POWER. I was so impressed by Microtones in the January 1986 issue that I decided to write to you. Joey Latimer put together a super musical program called *Old-Time Rock 'n' Roll*. I like it so much that I'm listening to it as I write to you.

PETER ALBA
Equinunk, Pennsylvania

COMPUTER SUPPORT

This letter refers to the possibility of your magazine dropping coverage of the Adam computer. I feel this would be a serious mistake. I feel that if anything, coverage of the Adam should be upgraded because in the past six months, so many Adam peripherals have become available.

If dropping Adam coverage is in FAMILY COMPUTING's plans, I hope you will reconsider because I really look forward to your magazine every month.

GUY CULP
Yeaton, Pennsylvania

In your January 1986 issue, in answer to a letter from a subscriber, you commented that because of the relatively small percentage of C 128 computers compared to the larger percentage of C 64s, your policy would be to publish programs that run on both machines.

Why can't you treat the C 128 as another computer? Many of your subscribers would upgrade from the C 64 to C 128 if they saw that you were including programs for it. I also am concerned whether or not you will take the same attitude toward the Amiga.

PETE HENDLER
Lillington, North Carolina

EDITOR'S NOTE: The articles regularly appearing in FAMILY COMPUTING are designed to provide general information both relevant and beneficial to all computer users. We're sure Adam and C 128 users, like owners of other computers, will continue to find valuable, practical information in FAMILY COMPUTING to help make their machines increasingly useful computing tools.

Our technical staff continues to develop and adapt original programs for the Adam (for example, see the program Weight On Other Planets on page 52 and the puzzle program in our April issue). Also, watch for items on the Adam in the Computing Clinic and New Hardware departments, and in the FAMILY COMPUTING Forum on CompuServe (GO FAMFORUM).

Both C 64 and C 128 owners can run the C 64 programs we publish already, and as the installed base of C 128s grows, we may publish programs specifically in 128 mode. Now, however, we can't meet the demands for specific programs for each machine. As for the Amiga, we don't have firm plans yet. Commodore is marketing it as a business machine, and we will postpone our decision until we see how many are bought for home and home/business use.

THE PROGRAMMER

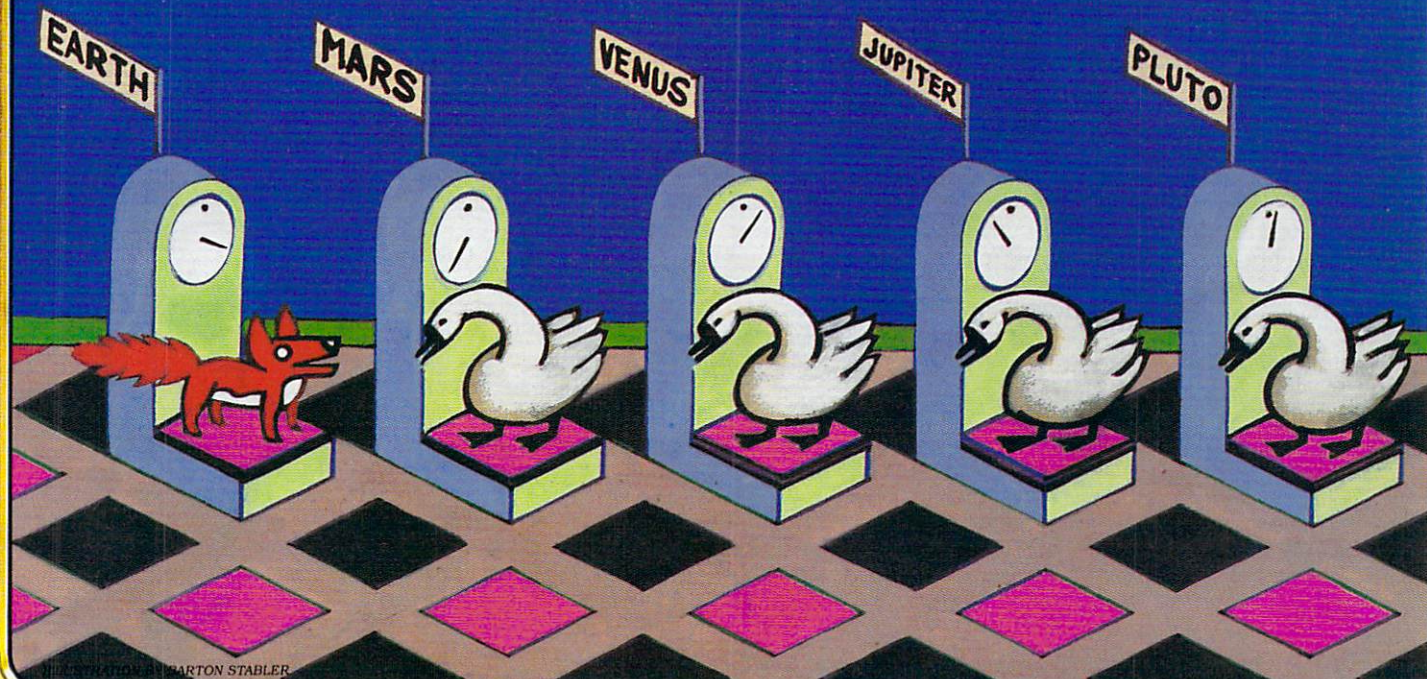


ILLUSTRATION BY BARTON STABLER

★

M A R C H

★

TIPS TO THE TYPIST
Page 65

**MORE PROGRAMS
IN K-POWER**
Page 73

**AND HOME-SCHOOL
CONNECTION**
Page 8

BEGINNER PROGRAM
Page 52

Ever wonder what
your computer
would weigh on the moon?
Find out with
Weight on Other Planets.

**EDUCATIONAL
PROGRAM**

Page 60

What kind of computer
are you?
Add *Multimath's*
drill-and-practice
to your homework regimen,
and watch skills multiply!

GAME PROGRAM
Page 66

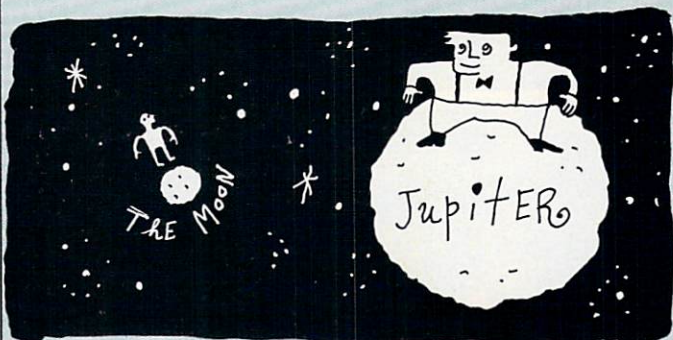
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and compatibles.

ILLUSTRATION BY JAMES CHERRY III

Cherry

WEIGHT ON OTHER PLANETS

BY JOEY LATIMER



Do you know how much a 2,000-pound elephant would weigh on Neptune? Can you guess how much your computer would weigh on the moon? You can answer these and other questions by typing in our March Beginner Program, *Weight on Other Planets*.

Weight on Other Planets lets you see how much an object weighs on the moon or on any planet in our solar system. Type in the program as shown, and SAVE it to disk or cassette before typing RUN. Then enter the Earth weight of any object and select a "heavenly body" from the menu.

PROGRAM NOTES

When you drop an object on Earth, the speed at which it falls increases by 9.72 meters per second every second. This expression (9.72 m/sec²), called an "equatorial gravitational acceleration constant," is related to Earth's mass. The more massive the planet, the faster things accelerate as they fall toward it. Similar constants have been calculated for each major body in our solar system (some constants used in *Weight on Other Planets* are drawn from *The New Solar System* by Sky Publishing, 1983).

If you want to figure out

what an object would weigh on another planet, use the following formula, where EW is the Earth weight of the object (in pounds, kilos, or other units), G1 is Earth's gravitational constant (9.72 m/sec²), and G2 is the other planet's constant:

$$\begin{aligned} \text{New Weight} &= (G2/G1) \times EW \\ &= (G2/9.72) \times EW \end{aligned}$$

For example, if you wanted to find out what a 150-pound object weighed on the moon (where falling objects accelerate at 1.62 m/sec²), you'd calculate:

$$\begin{aligned} (1.62/9.72) \times 150 &= 0.166 \times 150 \\ &= 24.9 \text{ lbs.} \end{aligned}$$

This formula is expressed in line 190 of the Apple version of the program (the line number in other versions may differ). Note that no parentheses are needed to ensure that the computer performs the division before the multiplication. This is because multiplication and division, each having equal priority in the computer's scheme, are evaluated as they occur from left to right in an expression. In a future Beginner Program, we'll learn more about the computer's built-in priority system for ordering mathematical operations.

To handle the different conversions, *Weight on*

Other Planets stores the names and gravitational constants of each planet in the solar system (plus those of Earth's moon—although it is not, strictly speaking, a planet). A string array, PLS, stores the names of the planets for use in the main menu. Their respective constants are stored in numeric array G. This information is READ into PLS and G by a FOR/NEXT loop (see lines 20-40 of the Apple version, opposite). For a quick brushup on arrays, see last month's Beginner Program (*Averaging*, page 41, February 1986).

HACKERS' CHALLENGE

By modifying the program slightly (i.e., by changing the prompts and the data in the data statements), it's easy to use *Weight on Other Planets* to create many different kinds of "conversion utilities." For example, suppose you substituted BUSHELS, PECKS, GALLONS, QUARTS, PINTS, GILLS, FLUID OUNCES, FLUID DRAMS, and MINIMS for the planet names, and conversion factors 2219.36, 554.84, 277.42, 69.355, 34.678, 8.669, 1.7339, 0.216734, and 0.003612 for the planets' acceleration constants. Then, you could modify the prompts appropriately and substitute the formula P/G(N) in line 190. You'd end up with a program that converted liquid volumes (expressed in cubic inches) to any of the listed measures. Try it, or make up your own conversion utility. Conversion factors and formulas can be found in most dictionaries and almanacs.

ATARI STRINGS AND STRING ARRAYS

The Atari version of *Weight on Other Planets* differs markedly from the other versions in the way it treats PLS. Atari BASIC doesn't have true string arrays capable of storing an entire word or phrase

in a single element. When you DIMENSION an Atari string with a statement like DIM AS(20), you're not creating a string array with twenty elements, but rather a simple string that can contain up to twenty characters (letters, numbers, punctuation marks, spaces, etc.).

Some programming savvy is required to use an Atari string to simulate a string array. The method we use here is to consider a string as a series of same-length fields, each of which contains one planet name. Since we want to store a total of nine planet names, the longest of which (THE MOON) contains eight characters (including the space), we begin by DIMENSIONING PLS to contain 72 characters in total—the equivalent of nine eight-character-long blocks laid end-to-end. Then, in the DATA statements, we "pad" each of the planet names with spaces, so each contains eight characters in all. Thereafter, when we READ in the planet names and add them to PLS, the spaces make each planet name begin on an even, eight-character boundary (PRINT PLS to see). The first block of the string, containing the name MERCURY, begins at character 1 and ends at character 8, and contains one trailing space; the second, VENUS, begins at character 9 and ends at character 16, and contains three trailing spaces, etc. In general terms, we can tell the ending character position of any element by multiplying its "number" by eight, and its starting position by subtracting seven from this figure. Unfortunately, this "simple" method of string-array simulation only works if you don't mind the extra spaces used to "pad" each element. More complex methods exist for eliminating excess spaces when storing elements of varying lengths.

ANATOMY OF A PROGRAM

Apple II series/Weight on Other Planets

Dimension two arrays, `PL$` and `G`, to contain planet names and gravitational constants.

Begin a `FOR/NEXT` loop to `READ` planet names and constants from the `DATA` statements (lines 1000-1020) into the storage arrays. Nine planets and their constants must be `READ` in so the loop will cycle nine times. The loop index, `I`, will point to successive elements of the two storage arrays.

Inside the loop: `READ` the name of a planet and its gravitational constant into the "`I`'th" elements of `PL$` and `G`.

End of the loop. If the loop has cycled nine times, continue; otherwise, go back and `READ` in another pair of elements.

Clear the screen.

Prompt the user to enter his or her weight. Accept this value via the `INPUT` statement, and place in variable `P`.

Clear the screen.

"Print" instructions for the user on the screen.

Leave one line blank for clarity.

Begin a `FOR/NEXT` loop to print out the planet names as a numbered "menu" of choices. Nine planet names must be printed out, so the loop will cycle nine times.

Print out the value of index `I`, followed by a parenthesis, a space, and the name of the planet contained in the "`I`'th" element of `PL$`.

End of the loop.

Leave a line blank.

Prompt the user to choose a planet by number. Accept this number and place it in variable `N`.

Check the value of `N` to make sure it's between 1 and 9. If not, go back to line 70, reprint the menu of choices, and ask the user to enter another number.

Clear the screen.

Calculate and print the equivalent weight on the planet chosen, along with an explanatory message. Use the planet's number, `N`, as a "pointer" to pull the correct gravitational constant out of storage array `G`, and use this value in the calculation.

Finish off the explanatory message, using `N` once more to pull the selected planet's name out of `PL$`.

Leave another line blank.

Print additional instructions. The semicolon (;) in line 240 holds the screen cursor at the end of the last line of text.

Accept one character from the user, and place it in `K$`.

Test to see which key was pressed, and respond appropriately. If a "`P`" or "`p`" was pressed (`CHR$(112)` refers to the ASCII code for lower case "`p`"), return to the planet menu.

If a "`W`" or "`w`" was pressed, return to the beginning of the program and let the user enter another weight.

If the key that was pressed wasn't a "`Q`" or a "`q`" (or a "`P`", "`p`", "`W`", or "`w`"), assume that an error was made and go back to let the user press another key.

If this line is reached, "`Q`" or "`q`" was pressed. End the program.

Data for planet names and gravitational constants.

```
10 DIM PL$(9),G(9)
```

```
20 FOR I = 1 TO 9
```

```
30 READ PL$(I),G(I)
```

```
40 NEXT I
```

```
50 HOME
```

```
60 INPUT "HOW MUCH DO YOU WEIGH IN POUNDS? ";P
```

```
70 HOME
```

```
80 PRINT "TYPE IN A NUMBER AND PRESS <RETURN>"
```

```
90 PRINT "TO SEE HOW MUCH YOU'D WEIGH ON"
```

```
100 PRINT "ANOTHER PLANET."
```

```
110 PRINT
```

```
120 FOR I = 1 TO 9
```

```
130 PRINT I;") ";PL$(I)
```

```
140 NEXT I
```

```
150 PRINT
```

```
160 INPUT "WHICH NUMBER DO YOU CHOOSE? ";N
```

```
170 IF N < 1 OR N > 9 THEN 70
```

```
180 HOME
```

```
190 PRINT "YOU WOULD WEIGH ";G(N)/9.72*P
```

```
200 PRINT "POUNDS ON ";PL$(N);"."
```

```
210 PRINT
```

```
220 PRINT "PRESS <P> TO TRY ANOTHER PLANET,"
```

```
230 PRINT "<W> TO ENTER ANOTHER WEIGHT,"
```

```
240 PRINT "OR <Q> TO QUIT.";
```

```
250 GET K$
```

```
260 IF K$ = "P" OR K$ = CHR$(112) THEN 70
```

```
270 IF K$ = "W" OR K$ = CHR$(119) THEN 50
```

```
280 IF K$ <> "Q" AND K$ <> CHR$(113) THEN 250
```

```
290 END
```

```
1000 DATA MERCURY,3.78,VENUS,8.6,THE MOON,1.62
```

```
1010 DATA MARS,3.72,JUPITER,27.89,SATURN,12.831
```

```
1020 DATA URANUS,9.03,NEPTUNE,11.95,PLUTO,0.291
```

BEGINNER PROGRAM

Adam/Weight on Other Planets

```
10 DIM pL$(9),g(9)
20 FOR i = 1 TO 9
30 READ pL$(i),g(i)
40 NEXT i
50 HOME
60 PRINT "How much do you weigh"
70 INPUT "in pounds? ";p
80 HOME
90 PRINT "Type in a number and press"
100 PRINT "<RETURN> to see how much"
110 PRINT "you'd weigh on another planet."
120 PRINT
130 FOR i = 1 TO 9
140 PRINT i;" ";pL$(i)
150 NEXT i
160 PRINT
170 INPUT "Which number do you choose? ";n
180 IF n < 1 OR n > 9 THEN 80
190 HOME
200 PRINT "You would weigh ";g(n)/9.72*p
210 PRINT "pounds on ";pL$(n);"."
220 PRINT
230 PRINT "Press <P> to try another"
240 PRINT "planet, <W> to enter another"
250 PRINT "weight, or <Q> to quit.";
260 GET k$
270 IF k$ = "P" OR k$ = "p" THEN 80
280 IF k$ = "W" OR k$ = "w" THEN 50
290 IF k$ <> "Q" AND k$ <> "q" THEN 260
300 END
1000 DATA Mercury,3.78,Venus,8.6,the Moon,1.62
1010 DATA Mars,3.72,Jupiter,27.89,Saturn,12.831
1020 DATA Uranus,9.03,Neptune,11.95,Pluto,.291
```

Atari 400, 800, 600/800XL, & 130XE/Weight on Other Planets

```
10 OPEN #1,4,0,"K:"
20 DIM PL$(72),TS(8),G(9)
```

```
30 FOR I=1 TO 9
40 READ TS,V
50 PL$(LEN(PL$)+1)=TS
60 G(I)=V
70 NEXT I
80 PRINT CHR$(125);
90 PRINT "HOW MUCH DO YOU WEIGH IN POUNDS";
100 INPUT P
110 PRINT CHR$(125);
120 PRINT "TYPE IN A NUMBER AND PRESS <RETURN>"
130 PRINT "TO SEE HOW MUCH YOU'D WEIGH"
140 PRINT "ON ANOTHER PLANET."
150 PRINT
160 FOR I=1 TO 9
170 PRINT I;" ";PL$(I*8-7,I*8)
180 NEXT I
190 PRINT
200 PRINT "WHICH NUMBER DO YOU CHOOSE";
210 INPUT N
220 IF N<1 OR N>9 THEN 110
230 PRINT CHR$(125);
240 PRINT "YOU WOULD WEIGH ";G(N)/9.72*P
250 PRINT "POUNDS ON ";PL$(N*8-7,N*8)
260 PRINT
270 PRINT "PRESS <P> TO TRY ANOTHER PLANET,"
280 PRINT "<W> TO ENTER ANOTHER WEIGHT,"
290 PRINT "OR <Q> TO QUIT.";
300 GET #1,K
310 IF K=ASC("P") THEN 110
320 IF K=ASC("W") THEN 80
330 IF K<>ASC("Q") THEN 300
340 END
999 REM --INCLUDE SPACES IN DATA AS SHOWN!--
1000 DATA MERCURY ,3.78,VENUS ,8.6,THE MOON,1.62
1010 DATA MARS ,3.72,JUPITER ,27.89,SATURN ,12.831
1020 DATA URANUS ,9.03,NEPTUNE ,11.95,PLUTO ,0.291
```

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