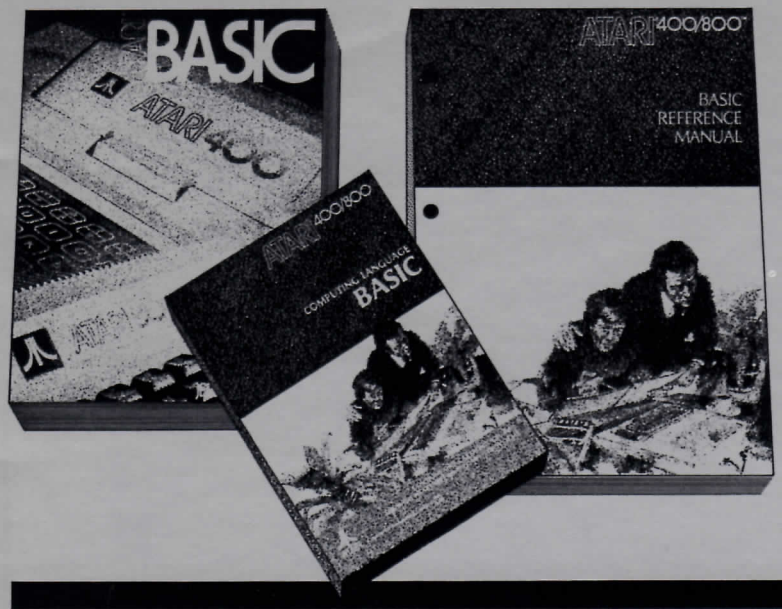
THE PROGRAMMER™

ATARI® 400™ COMPUTER SYSTEM



OWNER'S GUIDE

ATARI®

ATARI®

A Warner Communications Company

Welcome to the incredible world of ATARI® Computer programming! In just a few minutes, you'll have your new ATARI 400™ Computer up and running.

First, we'll go through the installation process (Steps 1 through 3). Then, starting with Step 4, we'll show some examples of programming.

The ATARI 400 Computer is programmed in a language called ATARI BASIC. This programming language is very similar to the BASIC languages found on much larger computers, but it has additional graphics, color and audio capabilities.

You'll be amazed at how powerful a simple ATARI BASIC program can be.

INSTALLATION

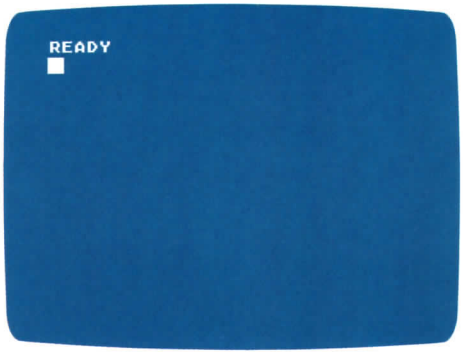
1 Unpack all of your equipment and read *The Basic Computer™ Owner's Guide.* Follow the ten steps for installing the TV Switch Box and connecting the computer console. Make sure the TV Switch Box is set to **Game** or **Computer,** that the TV is tuned to channel 2 or 3 and that the channel select switch on the computer is set to the same channel.

2 Push the door release lever down to raise the cartridge door.

3 Insert the ATARI BASIC Computing Language cartridge into the computer, with the label facing you. Press down firmly on the cartridge until it snaps into place. Then, close the cartridge door. Be sure the door snaps shut.

You're ready to begin programming now, and you won't have to repeat these installation steps. From now on, you can start up again at step 4.

PROGRAMMING IN ATARI BASIC



4 Turn on the power to your TV and to the computer. The screen will display the word READY. This means that the computer is ready for you to enter a program.

5 Your ATARI 400 Computer has two ways or modes in which programs can be entered.

- Direct Mode, in which single lines are entered and immediately executed. This mode is good for doing single-line calculations and for experimenting with other single program statements.
- Deferred Mode, in which multiple lines can be entered and are executed later, when you type in the "RUN" command. This mode is used in the great majority of cases.

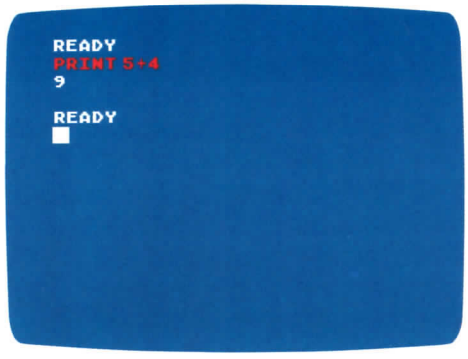
You don't have to tell the computer which mode to use; it knows by the way you type in your lines. We'll run through a few examples of each mode, and explain a few fundamentals about the keyboard and screen display as we go.

In the following photographs, your entries are colored red so you can distinguish what you should type from the information the computer responds with.

6 In the Direct Mode, single lines called "commands" or "statements" are entered, and the computer executes them immediately. For example, try typing the following line and pressing the RETURN key; be sure that the spacing between characters (or the lack of spacing) is exactly as shown here:

PRINT 5+4

This is what you should see on your TV screen:



7 If you make a mistake in typing, press the DELETE BACK S key to backspace. To clear the screen and start over, press the SYSTEM RESET key. Try using these two keys when you do Step 8.

8 The symbols used for calculating are:

Addition	+
Subtraction	–
Multiplication	*
Division	/

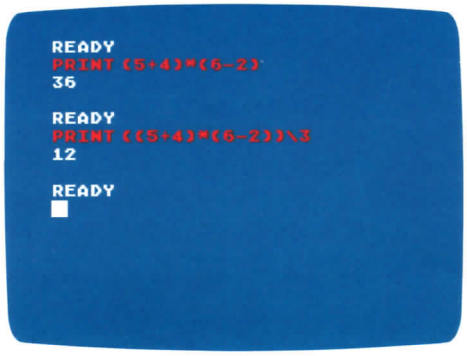
Complicated calculations use parentheses to separate the parts of the expression. The reference books mentioned later describe all the rules for expressing calculations, but try typing the following statement and pressing the RETURN key:

PRINT (5+4)*(6–2)

Now, try:

PRINT ((5+4)*(6–2))/3

Here's what you should see on your TV screen (your entries are shown in red):

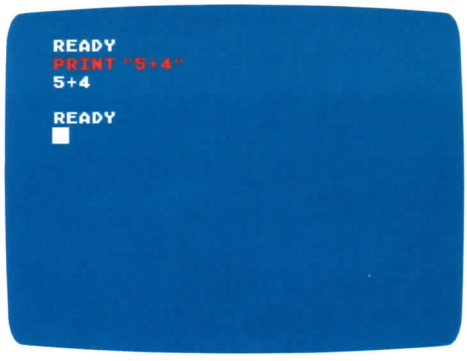


9 There's another way to use the PRINT command. When quotation marks are placed around the characters to be printed, those characters (called a "string" of characters) are printed literally, rather than being evaluated arithmetically.

For example, type this command and press the RETURN key:

PRINT "5+4"

Here's what you should see:

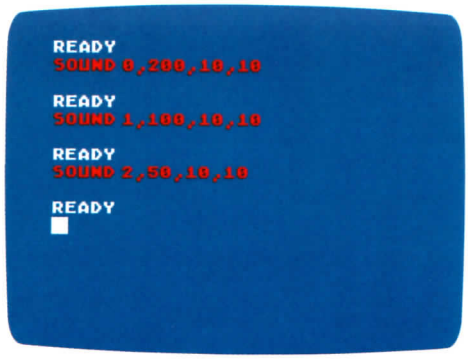


10 Your computer can generate an incredible range of sounds through the speaker on your TV set. For example, try entering the following three statements, ending each one with the RETURN key:

```
SOUND 0,200,10,10
SOUND 1,100,10,10
SOUND 2,50,10,10
```

The first number in these statements is the sound channel: up to four channels, each playing a different sound, can be used. The second number is the tone or note. The other numbers are explained in the *ATARI BASIC Self-Teaching Guide* and the *ATARI BASIC Reference Manual.*

In the screen below, we have pressed the SYSTEM RESET key before entering the three statements. Be sure to turn up the volume on your TV set to hear the sounds.



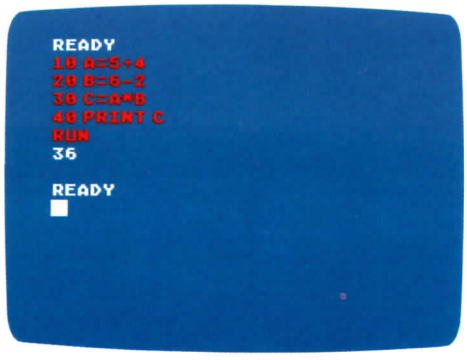
11 Press the SYSTEM RESET key to stop the sounds.

12 Now, let's move on to the Deferred Mode of programming which we mentioned in Step 5. In this mode, each line has a line number, and multiple lines comprising an entire program can be entered. The computer executes the program when you enter the RUN command.

For example, try typing the following lines, ending each one with the RETURN key. Again, be careful that the spacing between characters (or the lack of spacing) is exactly as shown:

```
10 A=5+4
20 B=6-2
30 C=A*B
40 PRINT C
RUN
```

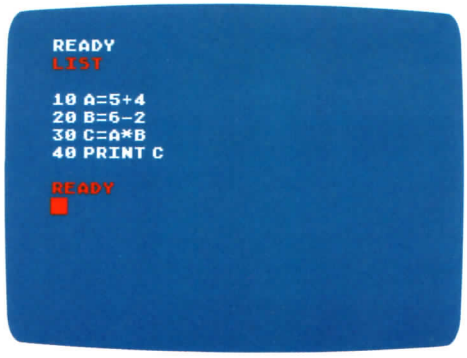
Here's what you should see on your TV screen:



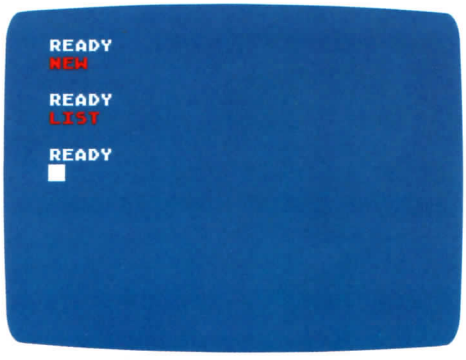
You can change lines you have already entered by simply retyping the line number with new information after the line number.

For example, if your see one of your lines displayed with the word "ERROR" in front of it, simply retype the line correctly, using the same line number.

Individual line numbers can be erased from the computer's memory by typing the line number and immediately pressing the RETURN key.



13 You can be sure that a program is in the computer's memory by typing the word LIST and pressing the RETURN key.



14 To clear the computer's memory in preparation for entering a new program, type the word NEW and press the RETURN key. Then, type the word LIST again to verify that the memory has actually been cleared: when the memory is empty, nothing will be listed.

15 Another way to clear the computer's memory is to turn the computer's power switch off, then on again. Pressing the SYSTEM RESET key simply clears the screen, not the memory.

Because turning the power off clears the memory, you may want a storage device, such as a tape recorder, for storing and retrieving programs. These are described in the next section.

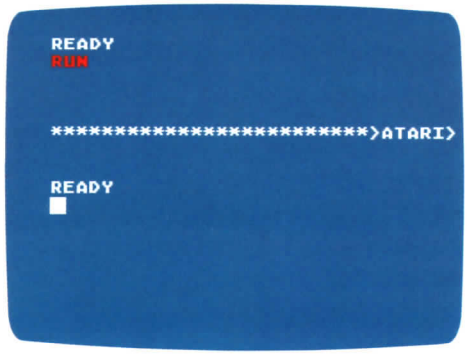
16 Now, let's try some fun programs. The first one is an Atari Rocket.

This program shoots a rocket across your TV screen, from column 0 (the left-most side) to column 32 (near the right side). At the same time, there is a blast of sound whose pitch increases and whose volume decreases as the rocket moves across the columns. The rocket is positioned in row 10, which is 10 lines down from the top of your TV screen.

To enter the program, press the SYSTEM RESET key to clear your screen. Then, type in the following lines:

```
10 FOR COLUMN=0 to 32
20 SOUND 0,COLUMN*5,8,
   COLUMN/2
30 POSITION COLUMN,10
40 PRINT "*>ATARI>"
50 NEXT COLUMN
```

Press the SYSTEM RESET key again to clear the screen. Make sure the volume on your TV is turned up. Then, type in the RUN command and press the RETURN key. Here's what you should see:

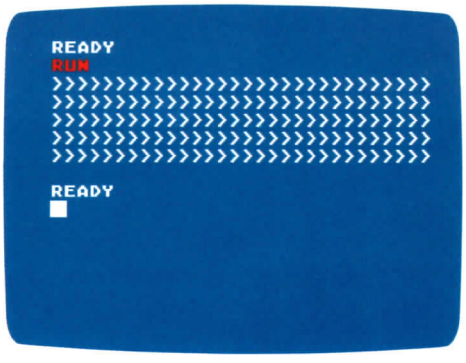


17 Here's another fun program. This one simulates a Locomotive. The locomotive chugs 190 miles across your TV screen and blows its whistle as it approaches the station, 175 miles away! The chugging sound is made with a varying loudness, where the loudness decreases from maximum to minimum in each mile that the locomotive moves.

To enter the program, press the SYSTEM RESET key to clear your screen. Then, type in the following lines:

```
NEW
10 FOR MILE=1 TO 190
20 FOR LOUDNESS=15 TO 0
STEP -1
30 SOUND 0,15,0,LOUDNESS
40 NEXT LOUDNESS
50 PRINT ">";
60 IF MILE=175 THEN SOUND
1,50,10,15
70 NEXT MILE
```

Press the SYSTEM RESET key again to clear the screen. Make sure the volume on your TV is turned up. Then, type in the RUN command and press the RETURN key. Here's what you should see:

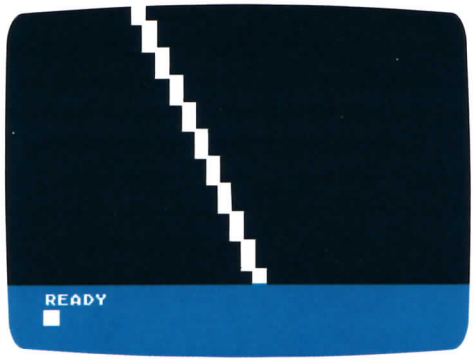


18 This program is a Lightning Bolt. It starts out by switching to a graphics display mode (as opposed to the normal text display mode). Then, it selects a starting color and plots (draws) a lightning bolt from column 10, row 0 to column 20, row 19 on your screen. Simultaneously, a sound with a varying pitch is generated. The lightning bolt blinks ten times through various colors. Time delays are built into the blinking so that you can see the colors longer.

To enter the program, press the SYSTEM RESET key to clear your screen. Then, type in the following lines:

```
NEW
10 GRAPHICS 3
15 COLOR 1
20 PLOT 10,0
25 DRAWTO 20,19
30 FOR PITCH=1 TO 255
35 SOUND 0,PITCH,8,15
40 NEXT PITCH
45 FOR BLINK=1 TO 10
50 SETCOLOR 0,BLINK,8
55 FOR DELAY=1 TO 100
60 NEXT DELAY
65 SETCOLOR 0,9,14
70 FOR DELAY=1 TO 100
75 NEXT DELAY
80 NEXT BLINK
```

Press the SYSTEM RESET key again to clear the screen. Make sure the volume on your TV is turned up. Then, type in the RUN command and press the RETURN key. Here's what you should see:

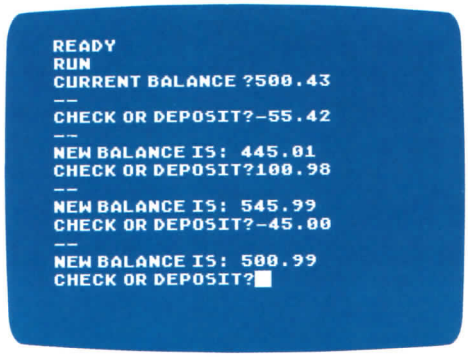


19 This final example is a Checkbook Balancing program. It starts out by asking your current balance. After you type this in and press the RETURN key, it repeatedly asks for check or deposit transactions, and then computes the new balance. Checks written against your account should be entered as negative numbers, while deposits made to your account should be entered as positive numbers.

To enter the program, press the SYSTEM RESET key to clear your screen. Then, type in the following lines:

```
NEW
10 PRINT "CURRENT
BALANCE ";
20 INPUT BALANCE
30 PRINT "—"
40 PRINT "CHECK OR
DEPOSIT";
50 INPUT TRANSACTION
60 PRINT "—"
70 BALANCE=BALANCE+
TRANSACTION
80 PRINT "NEW BALANCE
IS:   ";BALANCE
90 GO TO 40
```

Press the SYSTEM RESET key again to clear the screen and enter the RUN command. Then, answer the questions that the program asks you. Here's the kind of thing you should see:



Press the BREAK or SYSTEM RESET key to stop the Checkbook Balancing program.

20 Now, try your own hand at programming. If you're new at it, start by reading the *ATARI BASIC Self-Teaching Guide* (Wiley, 1979). This book takes you slowly and simply through each type of statement and command.

If you've had some experience at programming, you might want to start with the *ATARI BASIC Reference Manual.* This manual has an alphabetized list of statements and commands on page A-1 (Appendix A), a list of error messages on page B-1 (Appendix B) and a helpful index at the end.

Your imagination is the limit. You can create a wealth of fascinating and useful programs for budget projections, colorful graphic displays, musical games, or quizzes that ask questions and respond in all sorts of ways.

STORAGE DEVICES AND PRINTERS

As you write more and more programs, you may want to store them for later retrieval and reuse. This will save you from typing the programs in again each time you want to run them. You may also want printed copies of your programs.

Here's a list of storage devices and printers that will expand your enjoyment of the ATARI 400 Computer. Check the *ATARI Personal Computer Product Catalog* for more details, or get a demonstration at your local ATARI Computer dealer.

ATARI 410™ Program Recorder—This inexpensive tape recorder can store approximately 100,000 characters (bytes) of information on a standard 60-minute cassette tape.

ATARI 820™ Printer—This 40-column printer prints text on standard 3⅞" paper available from most stationery stores. Its printing speed is 40 characters per second.

ATARI 822™ Printer—This 40-column thermal printer prints text and plots points on thermal paper available from your ATARI Computer dealer. Its printing speed is 37 characters per second.

ATARI 825™ Printer—This 80-column printer prints text in four ways (including elongated, condensed and proportionally spaced) on three kinds of standard paper (roll, fan-fold and single sheets). Its printing speed varies between 50 and 83 characters per second, depending on the character font used. It also underlines. You will also need an ATARI 850™ Interface Module to use this printer.

WHERE TO GO FROM HERE

If you have an ATARI 410 Program Recorder, you'll find the following cassette programs especially useful in learning how to write your own programs in ATARI BASIC. The ATARI 410 Program Recorder comes in The Educator™ Kit or it can be purchased separately. The cassette programs are sold separately.

An Invitation to Programming™ 1
An Invitation to Programming 2*
An Invitation to Programming 3*

And this is just the beginning of the many exciting ways you can put your ATARI 400 Computer to work for you. Dozens of programs are available to help you in your business and education, or simply to enjoy. The following kits make it easy for you to expand your system so it can do more.

If you'd like to add to your system even more, the *ATARI Personal Computer Product Catalog,* available from your local ATARI Computer dealer, explains how many other ATARI products can enhance your computer.

*Available soon.

MORE SPECIALLY PRICED KITS FOR THE BASIC COMPUTER™

THE ENTERTAINER™

Insert the Star Raiders™ cartridge and become a Starship Commander! Arm your attack computer, jump through hyperspace and battle the attacking Zylon fighters!

The Entertainer kit comes with a pair of joystick controllers and two of the world's most exciting computer games—Star Raiders and Missile Command.™ To play Star Raiders, all you do is insert the cartridge, plug in a joystick and get ready for high-speed combat.

Many other exciting computer games for your ATARI Computer are available now or will be available soon.

Asteroids™
Space Invaders[1]
Super Breakout®
3-D Tic-Tac-Toe
Video Easel™
Basketball
Computer Chess

THE EDUCATOR™

Let the computer teach you a variety of subjects and skills. It can help you and your children learn faster because The Educator kit makes learning fun.

The Educator comes with an ATARI 410™ Program Recorder to load your programs, an ATARI BASIC cartridge and the States & Capitals program cassette. All you do is insert the cartridge, plug in the Program Recorder and load the program—the computer takes it from there.

Many other educational and self-improvement programs and games for your ATARI Computer are available now or will be available soon:

Energy Czar™
Hangman
Conversational Spanish
Conversational French
Conversational German
Conversational Italian
European Countries & Capitals
Touch Typing
Statistics 1
An Invitation to Programming™ 1
An Invitation to Programming 2
An Invitation to Programming 3
Kingdom™
Scram™ (A Nuclear Power Plant Simulation)
Biorhythm
Music Composer™
Blackjack
Mortgage & Loan Analysis[2]

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THE COMMUNICATOR™

The Communicator kit can tap into some of the biggest electronic brains in the world! Get the news hot off the wire or have The Communicator print your stock prices right on your TV screen. You'll also be able to get electronic mail, games and even "talk" to other users.

The Communicator kit comes with a TeleLink™ 1 cartridge, an ATARI 850™ Interface Module and an ATARI 830™ Acoustic Modem so you can send and receive information over any standard telephone. You also receive a free hour of connect time to the DOW JONES INFORMATION SERVICE, the COMPUSERVE INFORMATION SERVICES and THE SOURCE, AMERICA'S INFORMATION UTILITY,* so you can see the many fascinating kinds of information the computer can give you.

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