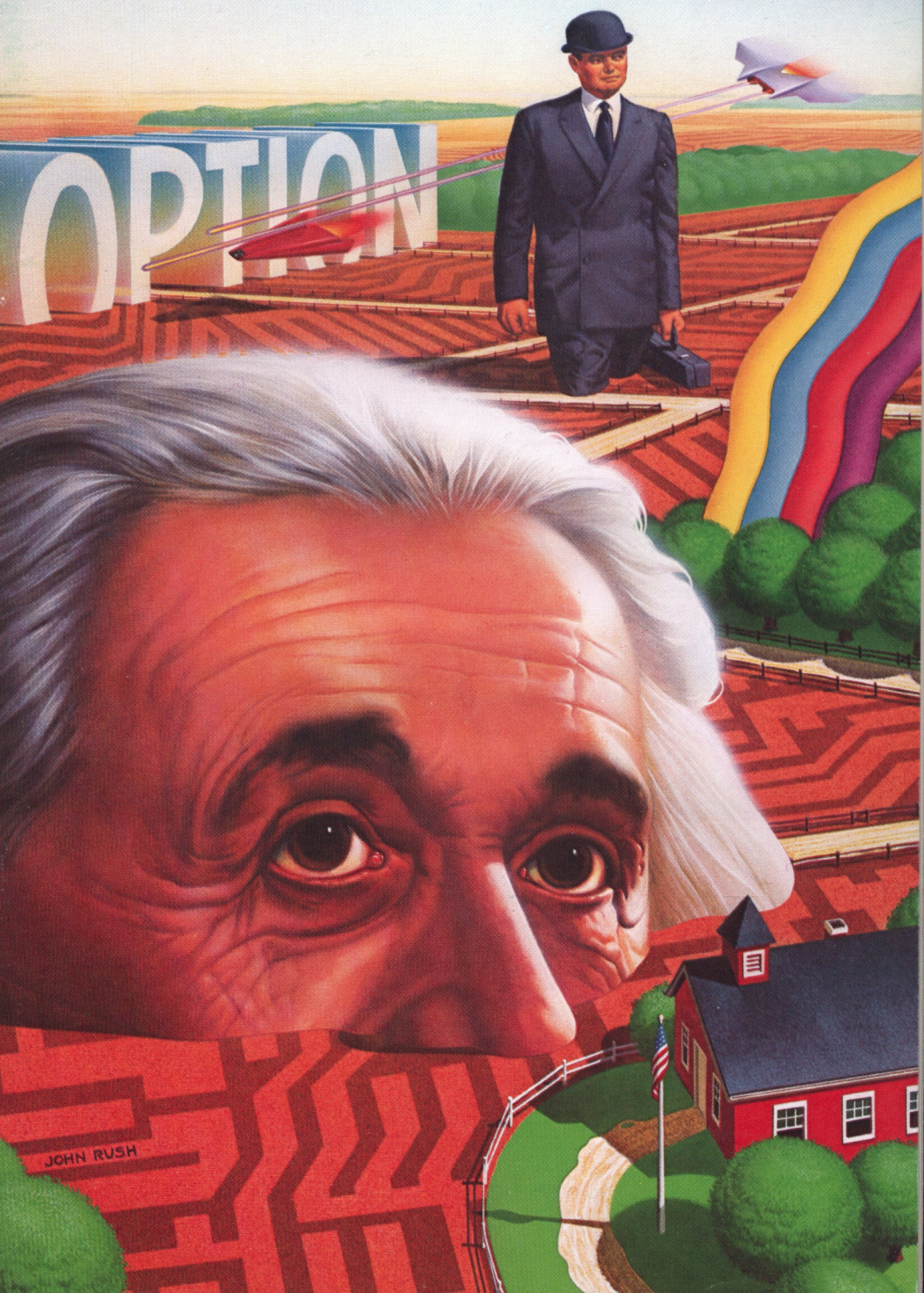# ATARI MICROSOFT BASIC II*



JOHN RUSH

ATARI® Microsoft BASIC II puts the power of the most advanced BASIC language in an easy-to-use, quick-loading 16K ROM (Read-Only Memory) cartridge. When you insert the cartridge in your ATARI Home Computer and turn the computer on, you're ready to use a wide variety of Microsoft BASIC programs. Add the Microsoft BASIC II Extension Diskette, and you can tackle most any BASIC programming job—from the simplest to the most complex. You can also convert Microsoft BASIC programs written for other computers so that they run on your ATARI Home Computer. A whole new world of creative programming awaits you!

## THE SOLUTION

ATARI Microsoft BASIC II can solve the problems of your BASIC programming universe quickly and efficiently. As part of the package, you get a thorough set of guidelines for its use, including a reference manual and a quick reference guide.

The *ATARI Microsoft BASIC II Reference Manual* includes:
- Complete loading instructions
- Introduction to Microsoft BASIC II
- Explanations of Microsoft BASIC II commands, statements, functions, and expressions
- Detailed information on graphics modes, player-missile graphics, and controllers
- Appendices that cover sample programs, ATASCII and alternate character sets, memory map, RS-232 information regarding the use of telephone communications, an alphabetical listing of Microsoft BASIC II keywords, and the error codes
- Conversion information to help you translate programs from other Microsoft BASIC dialects and from ATARI BASIC into Microsoft BASIC II

In addition to the reference manual, there's also a handy guide to Microsoft BASIC II: The *ATARI Microsoft BASIC II Quick Reference Guide.* Keep it by your side while programming for quick details on Microsoft BASIC II keywords and their use, the ATASCII character set, and explanations of errors.

## USING ACCESSORIES

You may use any number of accessories with Microsoft BASIC II, including printers, modems, up to four disk drives, and even digitizers and plotters. You'll find Microsoft BASIC II offers powerful commands to control your accessories quickly and conveniently.
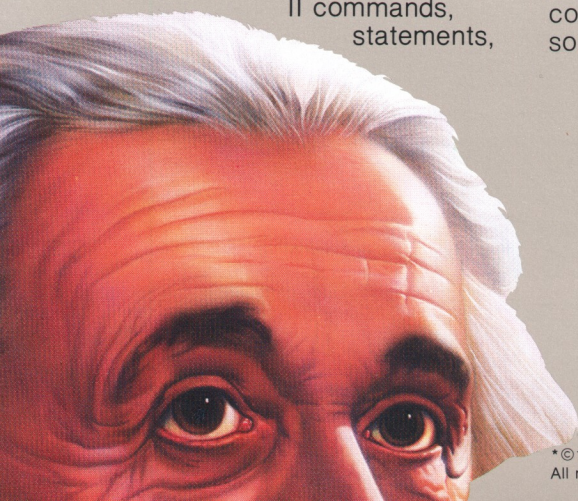
To use the ATARI Microsoft BASIC II cartridge, you must have a minimum system that consists of an ATARI Home Computer with 16K of RAM (Random Access Memory) and a standard TV set or monitor. If you want to load and save Microsoft BASIC II programs on cassette or diskette, you also need an ATARI 410™ Program Recorder or an ATARI 810™ Disk Drive. The Microsoft BASIC II Extension Diskette requires an ATARI 810 Disk Drive and can only be used with ATARI Disk Operating System version 2.0S.

## LOADING MICROSOFT BASIC II

*If you do not have a disk drive,* follow these steps to load your ATARI Microsoft BASIC II cartridge:

**1** Turn on your ATARI Home Computer by pressing the power switch on the right side of the console to ON.

**2** Pull the release lever toward you to open the cartridge door. (Whenever you do this, the computer automatically turns itself off.)

**3** Insert the ATARI Microsoft BASIC II cartridge in the cartridge slot (the left cartridge slot in your ATARI 800™ Home Computer) with the label facing you. Press the cartridge down carefully and firmly. Close the cartridge door and the computer turns on again.
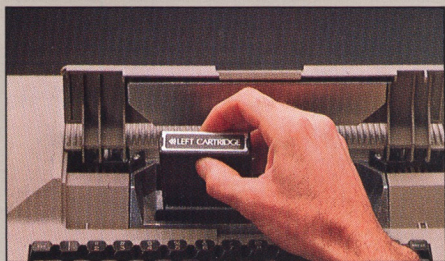


Microsoft BASIC II then takes command and loads itself into your computer's memory.

*If you have a disk drive,* follow these steps to load Microsoft BASIC II with the extension diskette:

**1** Make sure the power switch on the right side of your ATARI Home Computer console is turned OFF.

**2** Pull the release lever toward you to open the cartridge door.

**3** Insert the Microsoft BASIC II cartridge in the cartridge slot (the left cartridge slot in your ATARI 800 Home Computer) with the label facing you. Press down carefully and firmly. Close the cartridge door.

**4** Turn on disk drive 1. Wait until the red BUSY light goes off.

**5** Insert the Microsoft BASIC II Extension Diskette in the disk drive. Make sure the label faces up and to the right. Close the door of the disk drive. Turn the power switch on the right side of your computer console to ON.



Microsoft BASIC II then takes command and loads itself into your computer's memory automatically.

You'll know Microsoft BASIC II has loaded properly when you see the following information on your TV screen:

```
ATARI MICROSOFT BASIC II V2.0
(C) 1982 MICROSOFT
>
```

*WITHOUT DISK DRIVE*

```
20658 BYTES FREE
ATARI MICROSOFT BASIC II V2.0
(C) 1982 MICROSOFT
>
```

*WITH DISK DRIVE*

*(If you do not see one of the above screens, turn off your computer and repeat the steps outlined in "LOADING MICROSOFT BASIC II.")*

## COPYING THE MICROSOFT BASIC II EXTENSION DISKETTE

Your Microsoft BASIC II Extension Diskette contains several files that add convenient commands and features to the cartridge program of Microsoft BASIC II. To prevent the overlaying and destroying of these important files, the extension diskette comes in a "write-protected" jacket, which means that you cannot save programs on the original diskette. For this reason, you need to make a copy of the extension diskette before you begin to write your own programs.

Follow these steps to prepare your working copies of the Microsoft BASIC II Extension Diskette:

**1** With the extension diskette in your disk drive, Microsoft BASIC II loaded, and the prompt ( > ) showing, type DOS and press **RETURN**. Your TV screen displays the DOS menu when DOS is finished loading, which takes about 30 seconds.

**2** Remove the extension diskette from the disk drive.

**3** Insert the diskette to be formatted in your disk drive.

**4** Here's what the computer asks and how you respond:

COMPUTER: SELECT ITEM OR *RETURN* FOR MENU
YOU TYPE:  I **RETURN**
COMPUTER: WHICH DRIVE TO FORMAT?
YOU TYPE:  1 **RETURN**
COMPUTER: TYPE "Y" TO FORMAT DISK 1
YOU TYPE:  Y **RETURN**

**5** The disk drive whirs and clicks for less than a minute. You'll know the formatting process is finished when the screen displays "SELECT ITEM OR *RETURN* FOR MENU" again.

After your diskette has been formatted, you're ready to duplicate the extension diskette. Press **RETURN** for the DOS menu. Next, insert the extension diskette in your disk drive.

Follow these steps to make a working copy:

YOU TYPE: J RETURN
COMPUTER: DUP DISK-SOURCE, DEST DRIVES?
YOU TYPE: 1,1 RETURN
COMPUTER: INSERT SOURCE DISK, TYPE RETURN
YOU TYPE: RETURN
COMPUTER: TYPE "Y" IF OK TO USE PROGRAM AREA
CAUTION: A "Y" IN-VALIDATES MEM.SAV

(MEM.SAV is a file that saves part of Microsoft BASIC II and your program whenever you go to the DOS menu. Invalidating MEM.SAV frees memory for faster duplication of diskettes. But you'll have to reload MEM.SAV later to return to Microsoft BASIC II—see Step 6.)

YOU TYPE: Y RETURN
COMPUTER: INSERT DESTINA-TION DISK, TYPE RETURN

(At this point, remove the extension diskette and insert your formatted diskette.)

YOU TYPE: RETURN
COMPUTER: INSERT SOURCE DISK, TYPE RETURN

(Remove the formatted diskette and insert the extension diskette.)

YOU TYPE: RETURN
COMPUTER: INSERT DESTINA-TION DISK, TYPE RETURN

(Remove the extension diskette and insert the formatted diskette again.)

YOU TYPE: RETURN
COMPUTER: SELECT ITEM OR RETURN FOR MENU

The process of duplicating the extension diskette requires you to switch the diskettes in the disk drive twice. When the computer displays "SELECT ITEM OR RETURN FOR MENU," copying is completed.

You can check the directories on both the original and copy of the extension diskette to see if all is well. Type A and press RETURN. Then type RETURN again. A list of files appears on your TV screen. Then do the same thing with the other diskette in the drive. (For further information, see *An Introduction to the Disk Operating System* or the *ATARI Disk Operating System II Reference Manual*.)

**6** When you invalidate the MEM.SAV file, your access to the extension diskette features is suspended. In order to restore the use of these features, you must reload Microsoft BASIC II. With your working copy of the extension diskette in the drive, turn the power switch on the right side of your computer console to OFF and then turn it to ON again.

**7** Whenever "SELECT ITEM OR RETURN FOR MENU" appears on your TV screen, you may leave the DOS menu and return to Microsoft BASIC II by typing B (the "RUN CARTRIDGE" selection on the DOS menu) and pressing RETURN. After Microsoft BASIC II is re-entered, the prompt ( > ) will appear. Microsoft BASIC II is now ready to receive your commands.

ATARI Microsoft BASIC II has the power to take on large tasks, yet it's easy to use. You can enter commands directly (without typing a line number) and execute them immediately. Or you can start with a line number and defer the execution of commands until you type RUN. For example:

YOU TYPE:  PRINT "Welcome to Microsoft BASIC II." **RETURN**

COMPUTER: Welcome to Microsoft BASIC II.

Now use a line number:

YOU TYPE:  10 PRINT "Welcome to Microsoft BASIC II." **RETURN**

Microsoft BASIC II thinks you have typed the first line of a program; nothing happens until you type RUN and press **RETURN**.

YOU TYPE:  RUN **RETURN**

COMPUTER: Welcome to Microsoft BASIC II.

## SAVING A PROGRAM ON CASSETTE

If you have an ATARI 410 Program Recorder, you can save your one-line program on cassette by following these steps:

**1** Open the cover on your program recorder by pressing STOP/EJ.

**2** Insert a blank cassette and press the REWIND button to make sure the tape is rewound to the beginning.

**3** Press the tape counter button (on top of the program recorder) to reset the counter to zero. Then press ADVANCE and move the tape ahead to about 10.

**4** Close the cover. Next, type CSAVE and press **RETURN**. When you hear two beeps, press PLAY and REC on your program recorder, then press **RETURN**

again on the computer. The program recorder now begins to record the program onto the tape. When it's finished, the recorder automatically stops.

Now the program resides both in your computer's memory and on the tape. You could begin a new program at this point, but it's always wise to start with a "clean slate." Type NEW to clear the computer's memory, then type LIST (for listing lines) to see if line 10 is still there. Gone? Good.

## LOADING A PROGRAM FROM CASSETTE

Now try loading the program back into memory from the recorder. Follow these steps:

**1** Press REWIND to move the tape back to the beginning. Press the counter button to reset it to zero.

**2** Press ADVANCE to move the tape ahead to 10 on the counter.

**3** Now type CLOAD and press **RETURN**. You'll hear a beep from the computer to remind you to press PLAY on the program recorder.

**4** After pressing the PLAY button on your program recorder, press the **RETURN** key again. The cassette tape then begins to load into the computer's memory.

**5** When the program recorder stops, the Microsoft BASIC II ready prompt ( > ) appears on your TV screen. Type RUN to execute the program.

## SAVING A PROGRAM ON DISKETTE

If you have a disk drive, save your program on diskette with these steps:

**1** Insert a duplicate copy of the extension diskette (or any diskette formatted with DOS 2.0S) in your disk drive.

**2** Display your program lines by typing LIST and pressing **RETURN.**

**3** Type SAVE "D:MYTEST.AMB" and press **RETURN**. The program in the computer's memory is now stored on diskette and assigned the file name, MYTEST.AMB.

## LOADING A PROGRAM FROM DISKETTE

To load MYTEST.AMB from diskette into your computer's memory, follow these steps:

**1** Insert your diskette with the file MYTEST.AMB in your disk drive (if it's not in the drive already).

**2** To clear your computer's memory, type NEW and press **RETURN**. Then type LIST and press **RETURN** to make sure no program is there.

**3** Type LOAD "D:MYTEST.AMB" and press **RETURN**. When the file has loaded, the Microsoft BASIC II ready prompt ( > ) returns to the TV screen.

**4** Type LIST and press **RETURN** to see the program lines. Type RUN to execute the program.

Here's a look at some of the new keywords available with the Microsoft BASIC II cartridge:

| | |
|---|---|
| AFTER | CLEAR |
| CLEAR STACK | CLS |
| COMMON | DEF (numerical) |
| DEFDBL | DEFINT |
| DEFSNG | DEFSTR |
| ELSE | EOF |
| ERL | ERR |
| ERROR | INKEY$ |
| FILL | INSTR |
| KILL | LEFT$ |
| LINE INPUT | LOCK |
| MERGE | MID$ |
| MOVE | ON ERROR |
| OPTION BASE | OPTION CHR |
| OPTION PLM | OPTION RESERVE |
| PLOT...TO | PRINT...AT |
| PRINT...SPC | PRINT...TAB |
| RANDOMIZE | RIGHT$ |
| SCRN$ | STACK |
| TAN | TIME |
| TIME$ | UNLOCK |
| VERIFY | VARPTR |
| WAIT | XOR |

The following new commands and statements are available only with the extension diskette:

| | |
|---|---|
| AUTO | DEL |
| DEF (strings) | NAME |
| NOTE | PRINT USING |
| RENUM | STRING$ |
| TRON/TROFF | |

The following added features also reside on the extension diskette:
- Long error messages
- Sign-on message

Try a few. To fill your TV screen with stars, for example, type in the following program. After entering each line, type **RETURN**. Then

**OPTION**

type RUN and press **RETURN** to execute the program.

```
10  CLS
20  FOR I = 1 TO 100
30  X = RND(37):Y = RND(20)
40  PRINT AT(X,Y)"*";
50  NEXT
60  PRINT AT(2,21)"FINISHED";
```

Type NEW and press **RETURN** to clear the memory for entering a new program. Then try the following program—it lets you time your computer questions.

```
10  CLS:AFTER (300) GOTO 70
20  PRINT "YOU HAVE 5
    SECONDS TO PRESS A
    KEY,":PRINT "ANY KEY."
30  IF INKEY$ = "" THEN 30
40  PRINT "THANK YOU"
50  CLEAR STACK
60  END
70  PRINT "TIME'S UP!";
80  RESUME 50
```

Type NEW and press **RETURN** to clear the memory for another program—this one produces a secret word out of a larger word.

```
10  SECRET$ = "FUNDAMENTAL"
20  PRINT "THE SECRET WORD IS ";
30  PRINT LEFT$(SECRET$,1);
40  PRINT MID$(SECRET$,5,3)
```

(Hint: Answer rhymes with "name.")

Microsoft BASIC II gives you full control over the amazing sound, color and graphics features of your ATARI Home Computer.

The SOUND command lets you include music and sound effects in your programs. You can use up to four voices (think of them as singers in a quartet). You also set the pitch and distortion levels— which allow any sound from a single-note whine to the multiple octaves of a music synthesizer— and control the loudness and duration of each sound to play.

Here's the format for the SOUND command:

```
SOUND   0,10,10,10,50

4 Voices
        Pitch
   Distortion
     Loudness
       Duration
```
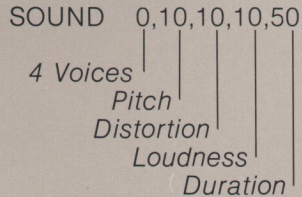
Try this example, using two voices.

Type in each line and press **RETURN**:

```
10  FOR I = 60 TO 120 STEP 6
20  SOUND 0,I,10,10,10
30  SOUND 1,120-I,10,10,10
40  NEXT I
50  GOTO 10
```

To execute the program, type RUN and press **RETURN**.

The Microsoft BASIC II commands that control the color and graphics features of your ATARI Home Computer provide the "brushes" and the "paint" that can satisfy all your artistic inclinations.

The COLOR and SETCOLOR commands, for example, allow you to use 128 colors. Try the program below and you'll see how commands like PLOT, PLOT...TO, FILL, and CLS help you draw and paint.

```
10   GRAPHICS 7
20   SETCOLOR 6,0,0
30   COLOR 1
40   PLOT 150,15 TO 150,65
50   FILL 15,65 TO 15,15
60   FOR I = 15 TO 0 STEP -1
70   FOR J = 0 TO 15
80   SETCOLOR 4,J,I
90   FOR K = 1 TO 100
100  NEXT K,J,I
120  END
```

Advanced programmers will appreciate the convenience of the OPTION commands, which reserve space in memory for special uses. OPTION PLM stores player-missile graphics, OPTION CHR handles custom-made character sets, and OPTION RESERVE allows storage of special assembly language routines.

# MICROSOFT BASIC II MAKES A DIFFERENCE

The BASIC programming language has a number of "dialects." ATARI BASIC is the dialect originally designed for ATARI 400™ and ATARI 800 Home Computers and is well respected for its ease of use. ATARI Microsoft BASIC II is similar to ATARI BASIC in structure and has many of the same commands, but the Microsoft BASIC II commands often give you more power than do similar commands in ATARI BASIC. And there are some differences in the way you need to format commands in Microsoft BASIC II.

If you're familiar with ATARI BASIC, you'll need to acquaint yourself with the differences between the two dialects. For instance, Microsoft BASIC II requires spaces before and after keywords (commands and statements), while ATARI BASIC ignores spaces to an extent. If you want to enter a string of variables that stand for a series of letters or numbers, Microsoft BASIC II does not require that you set aside space for them (with the DIM command) before you use them, while ATARI BASIC does. Microsoft BASIC II also allows multidimensional numerical and string arrays.

Here's a look at some of the commands used for similar purposes in the two dialects:

| MICROSOFT BASIC II | ATARI BASIC | PURPOSE |
| --- | --- | --- |
| CLEAR | CLR | Clear variables |
| FILL | XIO 18 | Paint color on the screen |
| MERGE | ENTER | Append programs |
| ON ERROR | TRAP | Trap errors |
| PLOT...TO | DRAW TO | Draw lines on the screen |
| AT | POSITION | Position cursor before printing on screen |
| SCRN$ | LOCATE | Retrieve information from screen |
| VARPTR | ADR | Retrieve memory address of a variable |

Although most of us *never ever* make mistakes, ATARI Microsoft BASIC II doesn't like to rub it in when we do. If a ''bug'' (that's computer talk for an error) does creep into your program, Microsoft BASIC II makes it easy to track down with the TRON command. This command allows you to trace your program instructions during execution. As each instruction is carried out, its line number is printed on the TV screen. When an error occurs, its line number is shown. Press **BREAK** to stop the program, turn off the TRON function with TROFF, change the instruction, and rerun the program.

If you have trouble locating the error, Microsoft BASIC II offers further help. The ERR function tells you the code number of the error involved, while the ERL function points out its line number. But you may never need either one if you use the extension diskette, since Microsoft BASIC II prints an explanation of most errors right on your TV screen—in English.

## HERE'S A LIST OF THEM:

| CODE | EXPLANATION |
|------|-------------|
| 1 | NEXT without FOR |
| 2 | Syntax error |
| 3 | RETURN without GOSUB |
| 4 | Out of DATA |
| 5 | Function call error |
| 6 | Overflow |
| 7 | Out of Memory |
| 8 | Undefined line |
| 9 | Subscript out of range |
| 10 | Redefinition error |
| 11 | Division by zero |
| 12 | Illegal direct error |
| 13 | Type mismatch |
| 14 | File input/output error |
| 15 | Quantity too big |
| 16 | Formula too complex |
| 17 | Can't continue |
| 18 | Undefined function |
| 19 | No RESUME |
| 20 | RESUME without ERROR |
| 21 | FOR without NEXT |
| 22 | LOCK error |
| 23 | Time error |

For a complete explanation of these and other errors, see your *ATARI Microsoft BASIC II Reference Manual*. For an explanation of DOS errors, see the *ATARI Disk Operating System II Reference Manual*.

# ATARI®