The computer's memory is like a filing cabinet. If we throw information inside the cabinet and do not place it in a file folder, it will be very difficult to find that information again. The containers are like folders into which we place information.

Compumate™, like most computers, uses two different sets of containers. One set of containers holds only numbers, the second set holds only letters and words.

The names of the containers that hold only numbers are:

A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P

The names of containers that hold only letters or words are:

Q$,R$,S$,T$,U$.V$,W$,X$,Y$,Z$

Notice the dollar sign that is attached to each name. This reminds both you and the computer that this container holds only letters or words.

Here is an example for you to type. It uses containers that hold only letters or words.

```
10 LET Q$ = "HI"
20 LET T$ = "THER
E"
30 PRT Q$
40 PRT T$
■
```

Type RUN. Compumate™ should print the words "HI" and "THERE" on the screen.

INPUT

As its name implies, the instruction INPUT allows you to put something into the computer's memory. Of course we must also use a container. Type the following:

10 INP A

20 PRT A

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Now type RUN. A question mark will appear on the screen. Type in any number and press **ENTER**. The computer will then print it out. Do you understand why? Line 10 tells Compumate™ to wait until you type in a number. Then Compumate™ places your number in container "A". Line 20 tells Compumate™ to print whatever is stored in "A". Since the number you typed is stored in "A", it prints your number. Try it. Type a number and then press **ENTER**.

Here is an example of an INPUT to a container that holds only letters or words. Type:

10 INP T$

20 PRT T$

Type RUN. A question mark will appear on the screen. Compumate™ is waiting for you to type in a few letters or a word and press **ENTER**. Then it will print whatever you typed. You must enclose the letter or word that you type in double quotation marks, for example, "Computers". Try it. Type a word, then press **ENTER**.

IF-THEN

It's time for us to present a program which is slightly more complex. Type the following:

10 LETA= RND(5)
20 INP B
30 IF B = A THEN
PRT "CORRECT"

This program is designed to play a guessing game. The computer picks a random number and places it in container "A" (line 10). It then waits for you to input your guess of a number from 0 to 5, which it then stores in container "B" (line 20). Then the two containers are compared. If the number in container "B" (your guess) equals the number stored in container "A" (the random number picked by the computer) Compumate ™ will print "CORRECT".

RUN the program and try your luck. If you do not guess the correct answer, Compumate™ will end the program, and print its usual "OK" message on the screen. If you don't get the guess correct the first time, then RUN the program again, and again, and...

REM

It might not be obvious from a quick look at the
last program (which was used to demonstrate
the IF-THEN command) what the program was
intended to do. To remind yourself what a
program is supposed to do you have the option
of placing comments in your programs. Taking
the last program as our example you should be
able to tell very quickly which line in the
following program we have added.

5 REM GUESSIN

G GAME

10 LET A = RND(5)

20 INP B

30 IF B = A THEN

PRT "CORRECT"

Line 5 is the addition. It contains the REM
instruction which is the abbreviated form of
REMark. Whatever words follow the REM
instruction are for your benefit only. They are
ignored by the computer, and are not used
together with the rest of your program.

FOR-NEXT

Type the following program:

10 FOR A = 1 TO

100

20 PRT A

30 NEXT A

Now type RUN and you will see all the numbers
between 1 and 100 printed on the screen, one
after the other. Do you understand why this
happened?

Take a look at the program you just typed.
What's the problem—it's not on the screen and
you don't want to retype the whole thing? The
solution is simple. Press the **FUNC** key and while
holding it down press the **LIST** key (the "K" key)
and then **ENTER**. Your program will be LISTed on
the screen.

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Line 10 tells Compumate™ to place all the numbers between 1 and 100 into the "A" container one at a time. The obedient computer begins by putting a 0 in the "A" container. The instruction PRT A on line 20 forces Compumate™ to look up the number stored in the "A" container and display it on the screen. Then on line 30, Compumate™ is told to take the next number after 0 and place that in the "A" container. Since a container can hold only one item at a time, the 0 is removed from the "A" container and the number 1 is inserted into the "A" container. Then the computer is sent back to line 10 to begin the process again.

Since the number 1 is one of the numbers that were specified to be placed in the "A" container, the computer proceeds to line 20 where Compumate™ finds the number 1 stored in "A" and prints it on the screen. Line 30 causes the number 1 to be erased from "A", places the number 2 in container "A" and returns to line 10. This loop continues until the 100 is placed in "A" and printed on the screen. Since the number 101 is past the boundary of 100 (which we told the computer to stop at), Compumate™ does not print the number 101, but simply stops.

The FOR-NEXT set of commands are always a pair. Never use one without the other. The FOR-NEXT loop works much differently than the loop that we can create with the GOTO command. As your programming skills develop, you will learn when the use of each is appropriate.

If you want to stop a program before it ends, for example, you want to stop the above program before it prints all the numbers from 1 to 100. Then press the **FUNC** key and while holding it down press the **BRK** key (the "B" key). To continue the program from where it paused, press the **FUNC** key and while holding it down press the **CONT** key (the "C" key).

GOSUB-RETURN

Type in the following:

10 PRT 1

20 GOS 70

30 PRT 3

40 GOS 80

50 GOTO 90

70 PRT 2

75 RTN

80 PRT 4

85 RTN

90 PRT "BYE"

Type RUN and you will see the numbers 1-4 and the word BYE printed on the screen.

Line 10 prints the number 1. The instruction GOS on line 20 is the abbreviated form of GOSUB which tells the computer to jump to the specified line. So the computer jumps to line 70 and prints the number 2. It continues to line 75, where it sees the instruction RTN which is short for RETURN. RTN sends Compumate™ back to the line that follows the one it jumped from. Since it jumped from line 20, Compumate™ returns to line 30 and prints number 3. Line 40 sends it to line 80 where it prints the number 4. Line 85 sends it back to line 50. Line 50 sends it to line 90 and it prints BYE.

We hope that you followed the flow of the program. Here is the order in which the lines of instructions were followed:

1.   10

2.   20

3.   70

4.   75

5.   30

6.   40

7.   80

8.   85

9.   50

10.   90

The GOS-RTN set of commands is a pair. Never use one without the other.

What is the difference between the GOTO command and the GOS-RTN command? Well both commands cause the computer to jump to another line. The difference is that when the GOTO command causes the computer to jump, the computer doesn't remember the line that it jumped from. Thus to return to its line of departure, you must instruct it with another GOTO command. However, when the GOS command causes the computer to jump, all you need do is tell it RTN,—without specifying a line number to return to—and Compumate™ will remember from which line it jumped.

To save and load BASIC programs follow the directions in the previous chapters on music and graphics.

Important! To change a line of instruction:

There are two ways to change a line of a program. Let's take the following simple program as our example:

10 PRT "HI"
20 PRT "LO"

If you want to erase line 10, you can type the number 10 and immediately press the **ENTER** key. To prove that this line has been erased, press the **FUNC-LIST** key combination and you will see that only line 20 will be listed.

A second way to erase a line is to press the **FUNC-DELE** key combination. Then type the number 10 and immediately press **ENTER**. This will delete line 10.

If you want to change line 10 to print the word "HE", simply retype the whole line to read:

10 PRT "HE"

NOTE: There is much more to the BASIC computer language than could possibly be utilized by your Atari VCS, even with the help of Compumate™. While Compumate™ provides an excellent introduction to computers there is much more to computer programming, art and music. When you have played with Compumate™ and feel that you want to step up to a more powerful personal computer, Spectravideo will be waiting with its SV-318. The SV-318 is your gateway to the world of practical and affordable personal computing.

APPENDIX A
Error Code Numbers
And Their Meaning

CODE #	MEANING
0	An instruction that is illegal in direct mode is entered as a direct mode command. e.g. the instruction FOR was typed and you pressed ENTER in direct mode. You forgot that the FOR instruction can only be used in a program.
1	You used a command that belongs in immediate mode inside a program that you are trying to save on a cassette tape. e.g. the instruction LIST or RUN was placed in a program.
2	The computer ran out of memory because your program was too large, or a FOR-NEXT loop was nested more than four levels deep, or a GOSUB was nested greater than 6 levels deep.
3	The string of characters you tried to store in a container is too long, it will not fit. Lessen the number of characters.
4	You tried to place a number in a container that holds only words, or a letter in a container that holds only numbers.
5	You used the FOR instruction without matching it with the NEXT instruction. Don't forget they are always a pair.
6	Invalid expression. What you typed doesn't mean anything to Compumate™. Check your spelling.
7	The number you input is either too small (less than −999999) or too big (greater than +999999) for Compumate™ to use.
8	The number resulting from a calculation that Compumate™ performed is too small or too big.
9	You tried to divide by zero. You forgot that, even in elementary school math, this is not allowed.

10   You used the RTN instruction but did not use a matching GOS instruction. You forgot that the GOS-RTN set of instructions is a pair.

11   You specified the line number for a GOTO, GOS or other instruction to jump to, but there is no such line number in your program.

12   You have told Compumate™ to CONTinue a program after you paused it (with the FUNC-BRK instruction), but it cannot continue.

13   Something went wrong when the cassette recorder was being used to load a program. Try it again, being careful not to jostle the machine.

14   An expression is too long because it contains more than 10 numbers or variables (containers).

APPENDIX B
Trouble Shooting Chart

SYMPTOM	POSSIBLE CAUSE	REMEDY
NO POWER	Power Switch not turned ON.	Turn on Power switch which is on the left-hand side of the machine.
	Power cable not connected	Be sure the power cable is connected to the computer and the wall sockets.
NO SOUND OR PICTURE	Wrong TV channel	Select channel 2 or 3
	Wrong TV hook up	Hook up the computer to the "VHF" antenna terminals.
	Loose video cable	Be sure all video cables are securely fastened.
NO SOUND	TV volume too low	Adjust the volume control of your TV.
NO COLOR		Adjust TV color level and fine tune the TV.