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USING THE ATARI ASSEMBLER EDITOR
by Charles Brown

BYTING BACK: "ABC's of Atari Computers"
Reviewed by Tim O'Brien

WHAT IS A COMPUTER?
by Senator Morris

THE EDITOR'S COLUMN

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BYTING BACK: "ABC's of Atari Computers", a Review.

The use and acceptance of microcomputers in the home and the office is growing daily. People who used to turn up their noses at our 'video toys' are discovering the tremendous potential of spreadsheets, word processors, and databases.

Despite the tens of millions of dollars in advertising spent by Apple and IBM before Christmas, the recent price reductions by Atari and the announcement of their new product line (and word-of-mouth by Atari users) is convincing many people that you don't have to spend five thousand dollars to have a real workhorse of a microcomputer. The introduction of INFINITY, a 'Lotus 1-2-3' type program by Atari for \$49/95, will only help to show that an Atari isn't just a 'video toy' anymore.

In the coming months, I hope to review some books, programs, and applications for the Atari PC. If anyone has any suggestions, comments, or questions, please feel free to contact me by telephone, on the ACEC bulletin board, or on Compuserve (#74766,200).

This month, I would like to review the book "ABC's of Atari Computers" by David E. Mently, published in 1984 by Datamost.

ABC's is an encyclopedia of terms that would be handy for anyone with an Atari PC. Each topic is listed in alphabetical order and explains in easy to understand words those strange sounding terms like CHBAS, DLI, AND MEMTOP.

For beginners, it not only helps to explain the computerese particular to the Atari PC, but many basic computer terms as well. It also gives a number of useful tips.

[Did you know that you can examine the contents of a file while in DOS? Use the (C)opy function and reply to the prompt with FILENAME.EXT,E:]

For programmers, useful memory locations are referenced in decimal and hex. Short routines help the beginning programmer to be able to use them. Tables give everything from keyboard codes to the connector pin layout for the 850

Interface module.

[Did you know that you can completely disable the keyboard for demos? Try POKE 16,255]

The real power of this book lies in the programs that it contains. Many of them are in the public domain and all are useful. An autodialing version of AMODEM, memory testers, disk menus, Basic binary file loaders, sector readers, and even a real-time clock are included. An order form is included in the back of the book for a diskette of the programs for \$15.95 from Datamost.

Of special interest are four pages of tables covering Atari, Epson, Gemini-10, NEC-8023A, and Okidata printers. These tables give the control codes for these printers in decimal and AtASCII form. In the future, I will try to cover this in greater detail.

"ABC's of Atari Computers" would be a worthwhile addition to the bookshelf of any Atari PC owner. If you would just like to browse through it, the Columbus Public Library has a copy available for loan. Check it out!

by Tim O'Brien

USING THE ATARI ASSEMBLER EDITOR

If you can believe it or not. I have made the move to machine language. Even though I am no expert on Basic. I have decided to try my luck in machine language. If anybody thinks that Basic is hard, you haven't seen anything yet.

In Basic the computer does practically everything for you. In machine language you have to instruct the computer step by step. For example, when you type in a Basic program the computer has a specific place in memory to store it. It does this automatically. On the other hand, when you type in a machine language program you have to tell the computer where to store it. If you have been reading my articles on memory you better believe you have to know a safe location to use. If you don't, it would be like doing a poke or a move to the wrong location. If you do that you can say goodbye to your program, unless you were smart enough to save it first. In this article I will try to introduce you to the Atari Assembler cartridge and it's purpose.

There are 3 parts to the Assembler cartridge. There is the editor then the assembler and finally the debugger. The 3 parts join together to help you write an assembly program. There are 2 parts to an assembly program. First there is the source code. This is what the programmer types in to the machine using the editor part of the cartridge. Any other programmer who knows machine language can read the source code and understand it. The 2nd part is the object code. This is the actual machine code in hexadecimal form of the source code. The object code is what the computer needs to run the program. It would be very to difficult if not impossible to decipher the object code and figure out what the programmer did.

The editor is what the programmer uses to type in the source code. The format for typing it is completely different from Basic. As mentioned before, the first line of command tells the computer where to store the object code of the program. You may have seen a lot of commands like this `x=usr(1536)`. The 1536 is the decimal form for page 6 of memory. If you have a small program this is a popular place to store it. So you will see that number a lot when it comes to machine language programs. The editor contains a lot of commands like some of the Basics have. Such as auto numbering, renumbering, find a string, and replace strings. These commands come in very handy in machine language too. When you wish to store your source program you use the list command to store it on the disk or recorder. Then you would use the enter command to bring it back to memory.

The second part of the cartridge is the assembler. It's main purpose is to take the source code and change it into the object code. When the code is converted it is stored in the memory location specified by the first line of the source code. As mentioned before, the object code is the actual binary code of the program. As an example, when you run a Basic program the computer has to take each line and convert it to machine code. Then it is executed. The assembler converts the source code into the object code. Then when you run the program there is no need for the computer to translate. It just takes off and runs it. This is why the machine language programs are many times faster than Basic.

The final part of the cartridge is the debugger. This is the part that you use to run the program. It also allows you to do other things. You can trace a program. You can step through a program a step at a time. You can display or change the contents of memory or you can display or change the different registers. The debugger is a very complicated part of the cartridge. It is too much to try and explain here.

I hope that I have given you a little peek at what machine language is all about. One Basic command could very easily be equal to many machine language commands. As I said before if I can do it then anybody can. The million dollar question is, can I do it?

by Charles Brown.

WHAT IS A COMPUTER? by Senator Morris

IT IS A NUMBER CRUNCHING MACHINE

The computer performs a task by making rapid arithmetic calculations by sorting and comparing information while using it to decide what should happen in a process.

To make sure the sequence is carried out in the correct order, computers have a built-in clock and often a control program, to regulate the flow of data.

You begin with a set of electronic signals that pass through the computer's circuits in a particular way. Since it is possible for voltage to be present or voltage not to be present and because there are only two conditions, the system is called binary. It is a very complicated process which changes as each generation of computers become more efficient as a result of new and complex scientific ideas. However, it is not necessary to know how the electronics function to make use of the computer.

On the other hand, it is necessary to know the language used by a particular computer. Beginner's All-purpose Symbolic Instruction Code (BASIC) is such a language. BASIC uses ordinary English words and familiar symbols and is a code of electronic pulses that are either on or off. Using a language like BASIC, a set of instructions that works together is called a program. The person who makes up the instructions is called a programmer.

HOW DOES EACH OPERATION START?

1. A 'program counter' follows the program and produces the address number of the location in the memory where the next instruction that is to be carried is stored.

2. Then the instruction/program becomes a code number which goes from the memory to the 'instruction register' and is held there until the instruction has been obeyed and then is held there until the instruction has been obeyed and then replaced by the next instruction code.

3. Next, the 'instruction decoder' interprets the code. Then the 'control unit' opens the required pathways to carry out the program. When data is needed, the numbers are transferred to a set of data registers.

WHAT MAKES UP A COMPUTER?

An operating computer is made up of three parts: 'HARDWARE', 'SOFTWARE', and 'FIRMWARE'. The hardware is that which you can see, touch, and move: the keyboard, microprocessor, memory chips, monitor, disk drive, etc. The software is the programs which make the hardware work for us. The firmware is the programs residing in the computer which lets the computer runs the programs we use.

There are three major categories of special hardware needed to make a computer.

1. CENTRAL PROCESSING UNIT

2. INPUT/OUTPUT devices: the most important output device is the

monitor; others are the printer, disk drive, and tape recorder. The joystick, paddles, and light pen are input devices.

3. MEMORY or STORAGE: the programs in ROM (read only memory) cannot be changed; the programs and data in RAM (random access memory) can be changed and change while the program is running.

The categories can be separated into five basic components and functional parts.

PROCESSOR, CONTROLLER, INPUT, OUTPUT, and MEMORY

1. CPU/ a Central Processing Unit is the brain of the computer and passes the code around its circuits. It looks in its memory and finds your instructions in a way that can be stored. Because the CPU processes information according to a clock like schedule, it will only consider the information it is immediately using, so it is necessary to use a memory. The CPU integrated circuit contains chips that has thousands of microscopic transistors and are connected to form many circuits.

The CPU has basically three functional parts:

(a) A control unit to direct its workings

(b) An Arithmetic and Logic Unit (ALU) where actual calculations are carried out.

(c) Memory registers, small electronic memory circuits which hold temporary results when they are sent back to the ALU by the control unit.

HOW DOES THE CPU WORK?

From the 'program counter' to 'memory' to 'instruction decoder' to 'control unit' which carries out the instructions. When data are needed, the numbers are transformed from the memory to a set of data registers and stored temporarily until another instruction sends them on to the ALU. Additions and results in the computation may be held briefly in the accumulator and the final result goes to a data register before it goes to the output unit.

HOW IS THE MEMORY ORGANIZED?

Bit/ BINARY digit. Each space of memory is called a bit and is represented as either a 1 (on) or a 0 (off).

Nibble/ A group of four bits. The numbers 0 to 15 are each represented as one nibble.

Byte/ A group of eight bits. There 256 different bytes made rearranging the 0 and 1 bites.

K/ Kilobytes. A group of 1,024 bytes.

HOW CAN I CONTROL THE COMPUTER?

By using a set of commands either from the keyboard or inside a program.

RUN/ tells the computer to execute the program in memory.

LIST/ is the command used to display the program in memory on the monitor.

END/ tells the computer where the program ends.

PRINT/ makes the computer work letters and numbers by sending them to the screen or the printer.

HOW CAN I LEARN MORE ABOUT THE ATARI COMPUTERS?

There are now many books that have been published about the Atari computers. One is reviewed in another article in this issue of the newsletter. Several other books have been reviewed in recent issues. Several magazines publish articles and programs for Atari computers: Analog, Antic, Compute, and Atari Explorer. Special Interest Groups formed by ACEC members can also help you.

ACEC

FOR SALE

PROGRAM CARTRIDGE: "Atari Telelink" for use with the Atari 830 Modem and the Atari 850 Interface. For the Atari 400 or 800. \$10.00

J.A. Simmons
6529 Masfield St.
Worthington, OH 43085
436-6447

THE EDITOR'S COLUMN

There are several topics that I wish to discuss this month. The first is that I have been editor of our newsletter for about a year and I would like to step down and let someone else take on the job. The April issue will be my last. The membership can help the new editor by submission of articles and by shopping around for better copying prices. The copying cost for this issue is \$.06 per page whereas previously it had been \$.04 per page.

I would like to give recognition to the authors of articles in this issue. Charles Brown has been our most prolific contributor this year. He has been writing programs in three of the Basic languages that run on the Atari computers: Ataric Basic, Basic XL, and Microsoft Basic. In his article in this issue, he tells us his experiences in learning machine language programming. He has submitted several utility programs to our Disk of the Month. He enjoys using the game generator programs.

Tim O'Brien has submitted a review of "ABC's of Atari Computers". He is a student at CTI studying data processing. He uses his Atari for word processing and telecommunications and enjoys playing simulation games. He has written and is now publishing a novel. He has published an article in RC Modeler (remote control) magazine.

Our third author for this month is Senator Morris. Her 'question and answer' type article is an overview of how a computer works. She is the six year daughter of Jim Morris. At the age of five, she was admitted to membership in the New York Academy of Sciences and the Ohio Academy of Sciences. She is an enthusiastic user of computers in the classroom as well as at home.

Norman Knapp

Miscellaneous Atari Items

PROGRAMS UNLIMITED went out the Atari business well over a year ago. However the following items were located in the Worthington Square store on the clearance table:

- 2 Modem "Signalman Mark II" (designed for use with the Atari 850 interface)\$35 ea.
- 1 Atari CX87 Modem Cable (designed for use with the Atari 830 Modem to the Atari 850 interface --9 pin "D")\$10
- 2 Atari CX89 Monitor Cable (5 pin DIN)..\$12 ea.
- 3 Microtek Atari Printer Cable--Serial ATC-S (9 pin).....\$12 ea.
- 1 Intec 48k memory add-on for the Atari 400 (only) no soldering.\$30
- 1 LeStick by Data Soft. Joystick\$14
- 5 Wico 12' joystick extensions\$3 ea.

To insure pricing take this sheets to the store with you.

By: Jim Simmons

