

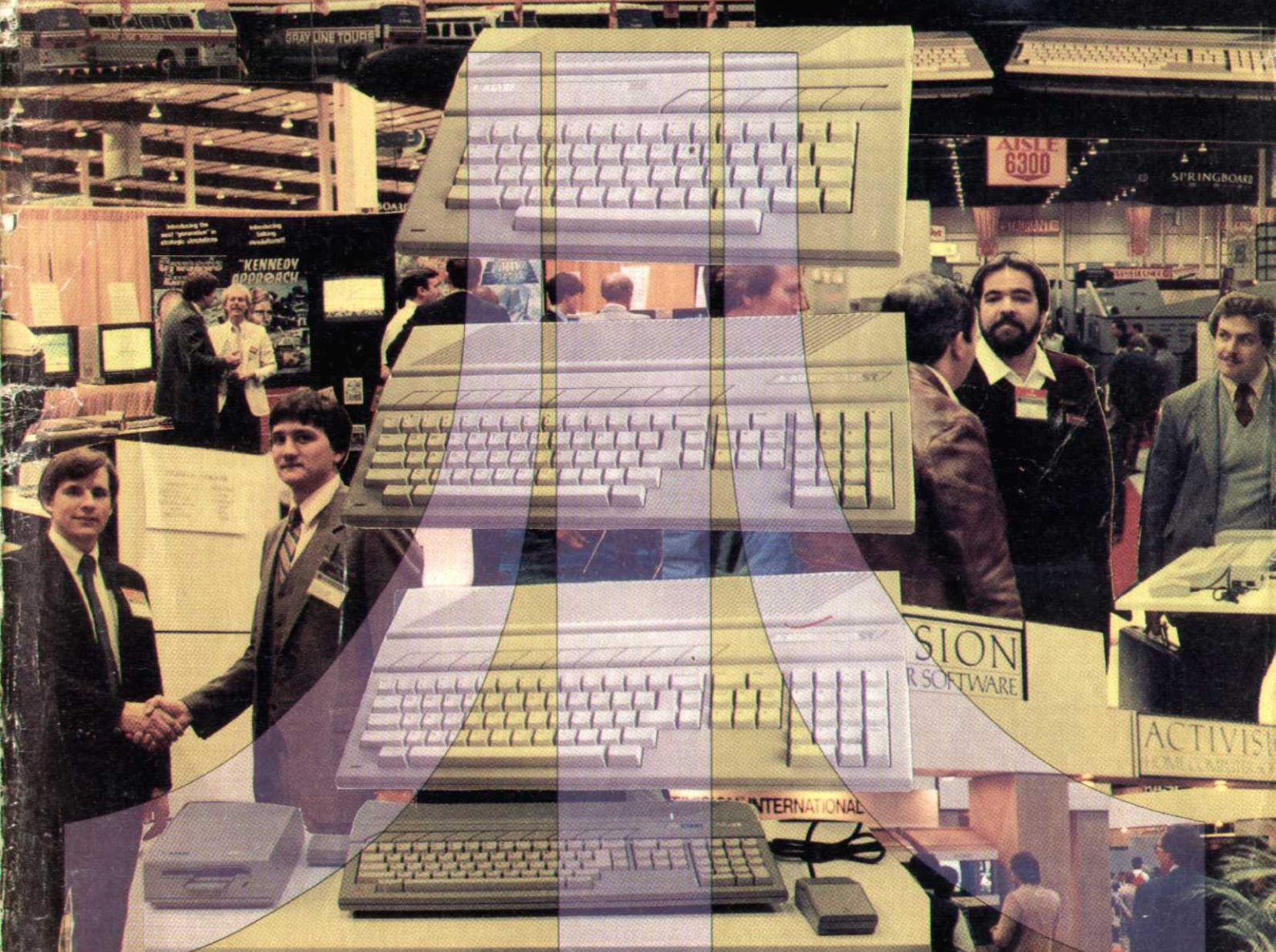
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Feb./March '85

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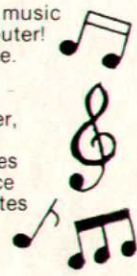
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ROM

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EDITORIAL

Congratulations to all members of the new Atari Organization. Since their assumption of control they have concentrated their efforts on producing a new line of computers that, in terms of scope and quality, promises to be the computer event of the year, and all this at a price that would not have seemed possible. We, at ROM, are very enthusiastic and will be supporting them in every way with news, new product reviews, programs, and tutorials.

I would like now to mention another item of special interest. Atari, under the guidance of its Director of Publications, Mr. Neil Harris, has commenced production of its own magazine, bearing the name "The Atari Explorer." Released at the Winter CES in Las Vegas, the first issue, replacing the previous magazine—"The Atari Connection"—was primarily devoted to the introduction of the Atari Staff and to a general overview of the new Atari presence. It is a very attractive and interesting magazine which will no doubt become a great success. We, at ROM, wish Mr. Harris and his staff well in this undertaking.

This issue contains another excellent machine language game by Jack Chung called, "Flight of the Condor." It combines strategy, luck, and arcade action, thus making a very enjoyable game. In this issue we are starting a column called "Canada's Atari." In it we will look at what is happening with the Atari in Canada and how it affects its users. In this section we have an interview with Michael Riechman from Batteries Included, a Toronto based company that puts out Paperclip, B/Graph, and Homepack for the Atari. If you have any suggestions or ideas that might work for this section, give us a call or write us a letter. We'd very much appreciate it. Other things in this issue include the following: A special write-up on the 1985 Winter Consumers Electronic Show, Atari at the Fair, Jake the Software Dude, Beginner's Line (by Sol Guber, author of Lines of Action in the last issue), Why Buy An ATARI?, a look at the new 16-bit computers, and two tutorials by Bob Cockroft.

I would like to say one thing about a new BASIC utility that one of our reviewers reviewed in this issue. It is called, 'Enhancements to BASIC' and is an excellent buy at \$14.95.

We believe that with your help ROM can become the number one Atari magazine, and we will continue to be supportive to all Atari Users and of their activities. Having in mind the rejuvenation of the Atari Organization and its outstanding machines, I know we can all look forward to a computer related future that is both exciting and rewarding.

We have been amazed at, and ever grateful for the unreserved support that you have all given us so far;

we will continue our efforts to be deserving of this generosity.

Bob Cockroft
Acting Editor/Publisher

LETTERS

Dear ROM:

I picked up a copy of the DEC/JAN issue of the magazine at the Atari booth at the Vegas show and was impressed by it.

I own an 800 and 800XL and after seeing Atari's ST's, I'll own one when they come on to the market. I'm happy to see that Atari is being revived by the the new management, they had me worried for a while, and if they live up to their presentation as shown at the show, it looks like they'll have a great future.

P.S. Personally, I'd like to say thank you for sticking by the Atari when times looked very dark. A number of magazines did not.

William Vrla
Rochester, NY

Dear William:

Thank you for that encouragement, and we feel that with Atari's new computers and management, it will once again become a dominating company in the world of personal computers.

Dear ROM:

The other day, I picked up the seventh issue, and I'd like to say it's great! Immediately, I went out to get the eighth!

In number 7 it mentioned back issues were available. Please write back telling me how I can order them. I want to get all of them, especially the one with Data Check. Just one more thing! Your getting these compliments from a 12 year old boy with an Atari 800 and 410, and hoping for an Indus Disk Drive.

Keep up the good work!

Kevin White
Berea, Ohio

Dear Kevin:

It is very exciting to receive encouraging letters from young people. It tells us that our magazine has a very wide scope — from the young to the old. Also, in the next issue DATA CHECK II will be listed.

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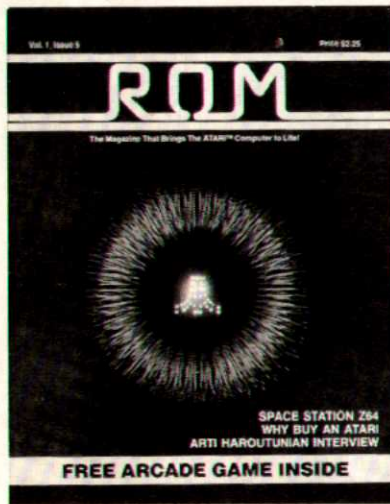
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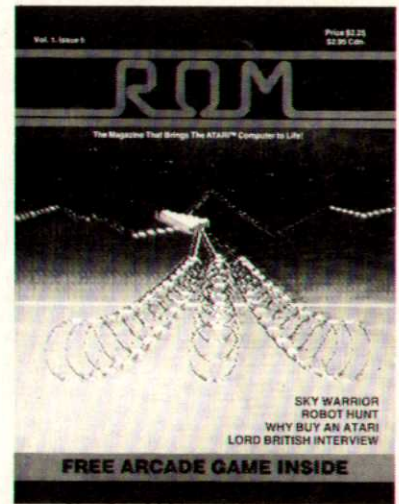
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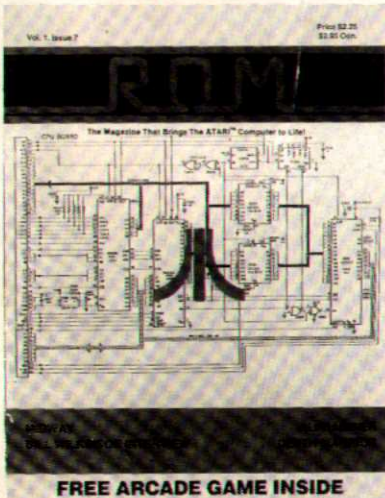
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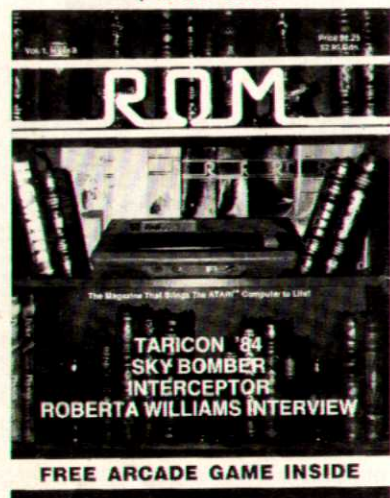
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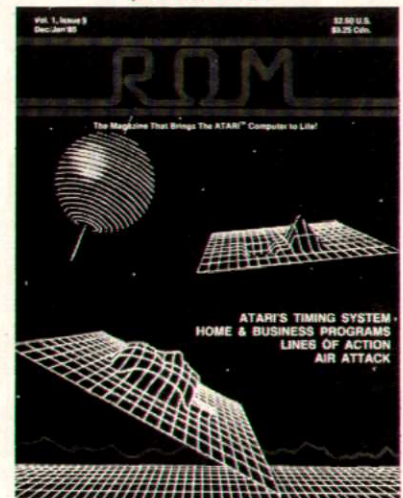
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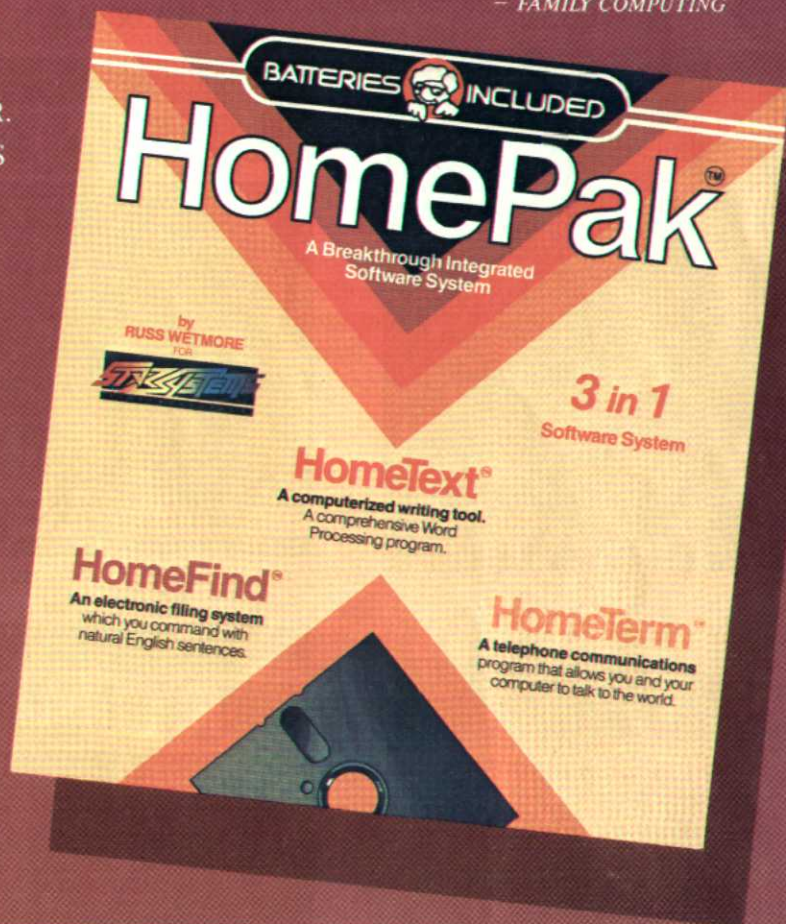
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Canada's Atari

by Peter Ellison

Batteries Included started off in 1978 as a retail business in a fashionable, upscale part of Toronto. Now it's exploded into a multi-million-dollar multi-faceted corporation, charging its way into the international computer software and accessory market.

The business really began in the summer of 1976 and 1977 when brothers Alan and Robbie Krofchick set up a display at the annual Canadian National Exhibition to sell Commodore calculators and watches. The following year Commodore and the Krofchicks manned the display together and introduced Commodore's first computer, the PET, to the Canadian public. After the show, the brothers and their sister, Marcie Swartz, set up a retail outlet for the micro masses. The hand-held electronic games and calculators they carried always advertised "batteries not included," so they included the batteries, free, and named themselves Batteries Included.

On January 24, 1985, I was able to speak with Michael Reichmann, Director of Product Development. It was a very enjoyable and informative interview, and I hope you enjoy this report as much I did the interview itself.



Michael Reichmann

Q. How many people are currently employed in your U.S. office in California?

A. We currently have five people.

Q. Is it primarily marketing?

A. Yes, marketing, sales, and distribution.

Q. How large are your offices in Richmond Hill, Ontario?

A. We have fifty people at the Toronto office; so we have a total staff of sixty people.

Q. Could you break that down into specific areas?

A. It's hard to say. We have a product development group of about five, an advertising, marketing, and promotions group of about five, a general office administration group of about ten, a manufacturing,

warehousing, repair group of about fifteen, a product support (answering phones, etc.) group of about three. I may be plus or minus a few in each category, but I think that adds up to about fifty five here in Toronto.

Q. Your very popular program, "Paperclip," how many have been sold in Canada and the U.S.?

A. That's proprietary information, but its sufficient to say its in the hundred thousand range, and as you know, its been on Billboard's best sellers list for about twenty-eight weeks, and the first week in January was number one.

Q. How old are Alan and Robbie Krofchick?

A. They're in their thirties.

Q. How difficult was it to get financing from the beginning of Batteries Included?

A. The company has never had outside financing. It has always been privately owned and totally financed out of its own growth.

Q. Will Batteries Included be supporting the new line of Atari computers?

A. No question about it. We are a certified Atari developer and we will be receiving prototypes of the new machines as soon as they become available. We have also been invited by Digital Research to attend the first GEM developer's seminar in Monterey on February 15, and we will be sending our senior software and hardware engineers to that seminar, and we have major development projects already underway for the Atari ST series.

Q. Will any of your currently available software be converted to it, or will it all be new?

A. I think you could say that we will have a major line for the Atari STs. I can't say much more about this at this time, or give you specifics of what the products are, or what they're going to be called, or what they're going to be priced at, but you can expect to see a major line of software for the Atari STs, and at the June CES, you can probably see the first ST product from us ready to ship.

Q. How many inhouse programmers are working for you at this time?

A. We don't work that way. We have an inhouse engineering and development staff of five people, but on the whole, they do not actually write our programs. All of our programs are written by contract programmers who have on-going relationships with us, but they are not actually on staff.

Q. Do all of your programmers who make conversions work inhouse, or are they contracted out also?

A. No, conversion work is also done outside. Sometimes its done by the programmer or the programming organization who brought us the original project; sometimes its done by other parties. To give

you an example, the Homepack Line is done by Russ Wetmore, and Russ actually wrote himself the Atari version, but the Apple, Commodore 64, and IBM PC jr and PC versions are all being done under Russ's direction by other people. The Macintosh version, he's doing himself.

Q. What kind of deal do you offer programmers?

A. That really varies. It depends on whether the person is approaching us with a finished product, a product that is under development, or a product that is just in the conception stage. I can't really give you specifics because that's confidential information, but a programmer can expect to receive advances against future royalties that are sufficient to justify a lengthy development process. They get good competitive royalties.



From Left to Right

Allan Krofchick, Faye Zukerman (Billboard Magazine), Robbie Krofchick, at presentation of "Number One" award to Batteries Included for Paperclip at the January 1985 CES.

Q. What process takes place in the development of a new program, from the drawing board on up?

A. Lets take an example of Homepack. Russ Wetmore approached us in the spring of 1984 and said, "I have a concept for this product, and are you interested in it?" We said, "Yes we're definitely interested." At that point he did some further work and did up some sample screens to show how the program would look, and prepared a detailed product specification to describe what the programs were going to do and how they were going to look. We then also entered into discussions on how it should be packaged and priced, and on the time table. At that point we signed a contract for the first two versions which were going to be the Atari and Commodore 64 versions, and then Russ went off to develop those programs, and during that process it became clear that it was more than likely going to be a success. So we also signed a contract for Apple and PC jr versions. Throughout the process, what happens is that the author is working on a project

on a regular basis that varies from once every couple of weeks, or at least, once a month, sending us examples of the work in progress for our comments and evaluation. During that process we get the advertising and packaging design people involved and start developing a marketing concept and a packaging look. We then get someone to write the documentation. They become familiar with the program and start talking to the author, and we then again work up a style for this program, depending upon whether it is aimed at beginners or at sophisticated users, and what the documentation should be like. Its a very intensive ongoing process, and frankly, I think most consumers don't have really any idea of how much detail work goes into bringing a product to market.

Q. When your developing a program is there research done within the company? Do you research a program and then give it to a programmer to write?

A. Yes, that happens as well. Then again, the answer to that isn't clear-cut, situations vary. For example, we are just doing a version of "Paperclip" for the Atari and Apple II, and both of these will be completed and be shipped in about thirty days. They were both started at about the same time but by very different programmers, and the criteria we used was also very different. On the Apple version the people that we hired to do the conversion wanted to do a version that was as close as possible to the Commodore original. That was agreed upon, and it was taken in that direction. On the Atari version, the programmers which we hired had some very clear thoughts in their own minds of what the program should be like, and we entered into a dialogue on that. We all agreed that the editor that is contained in the ACTION! cartridge is one of the best editors we'd ever seen. So we got in touch with Clinton Parker (author of ACTION!), and we asked him if he would like to work with us in terms of making that editor available as the core to a full-blown word processor. He said yes, and got very enthusiastic about that, and so, with the Atari "Paperclip," the only resemblance to the 64 version is that for each machine it is the most powerful full-feature word processor on the market. We've taken a lot of the features that were available in the Commodore 64 version but they are done in a very Atari specific environment. What I'm trying to indicate is that every program, every process is a different story. To give you another example, in the case of "B/Graph," it already existed. It became available, and we said "fine" and basically wrote a new manual, made a new box, made some minor enhancements to the program, and there it is. In the case of "Paperclip," it was a fresh start, using an existing editor. For example, we have a new beginners spreadsheet program called "Calkit" for the 64, and, then again, this was a product that another company

had developed on their own but then discovered that they couldn't market it. Also, it had a different name. They sold a few hundred but discovered that they didn't have the marketing ability and so approached us. We said, "Okay we're interested, but it needs a lot of changes." So the version we're now publishing is an offshoot of that original program that never made it to market on its own. So, what I'm trying to indicate is that there are no hard and fast rules, every product is a separate product. Another example is, we have a typing tutor on the Commodore 64 called, "Keys to Typing." This was developed by a private school. We saw it one day about six months ago and said "wow!" that is a fantastic typing tutor; we're interested in publishing it. They said, "Oh, we never thought of that. We just developed it for our own inhouse use to teach kids in our school how to type." So it's a very different process. Say, in regard to the Atari's STs or Commodore's Amega, we have our own development team that is inhouse and is drawing up the specification for a complete product line, but the development for each individual program is going to be done by contract programmers, and these people are located all over North America. Now we have about twenty programmers working for us under contract, and only two of them are in Toronto.

Q. The Commodore seems to be the central machine around which development of BI's products for other machines revolve. Is that true?

A. No, that isn't true. The company started off in software publishing by publishing two main products for the Commodore 64—"Paperclip" and the "Consultant." Currently, we are publishing products for all of the major systems, and if you sit down and count up the machines and the products, you will see that we have more products for non-Commodore machines than we do for Commodore machines, even though our Commodore products are still the cornerstone in terms of sales for the company. That was a very deliberate move on our part. It started in the spring of last year, just about a year ago. We had grown up riding the crest of the wave on the Commodore 64, and then we said, "This is a very good and healthy market for us." However, products for machines from other manufacturers needed attention, so we made a very specific commitment. I would say, with regard to Atari, that we started by looking at publishing programs for the Atari last spring and summer, which was at a time when it looked like Atari was going to go down the tube. That was a very brave move because the indications during that period were that Atari, under Warner, was going to be a loser. So we took a chance and now find ourselves on the market with "B/Graph," "Homepack," and, very shortly, with "Paperclip," at a time when virtually all other publishers had abandoned the Atari market. We are

now, along with everyone else, rushing to do Atari products, and we are in the happy situation of having new high-quality Atari productivity software at a time when very few other people do.

Q. From your point of view, what looms out there as the biggest probable danger? Are you afraid of growing too fast?

A. Fast growth is always a problem, and we face it. We're definitely in a hyper-growth business, and we have managed to double our sales every year for the past five years. As you can imagine, that type of exponential growth very quickly becomes a problem. We have just moved into a new building. Previous to the move last week, we were in three buildings around the city. We had one warehouse/manufacturing area, a software/hardware development lab, and we had a retail store in our general offices. We have now closed the retail store so that we could concentrate on our publishing and manufacturing activities, and we have now moved into one new building that consolidates all of our facilities. So that's one step forward in handling our growth. The second was that a year ago we opened our California marketing and distribution office, and again, that was a recognition that 80% of our business is in the U.S., and so we needed to have an actual warehouse facility and marketing presence within the U.S. market. The third step with which we are trying to handle growth is that we just made a major trip to Europe this past fall, and we now have solid distribution and licensing agreements in Spain, England, France, Belgium and Germany. Our products were being sold in Europe, but we now have much more mature, solid distribution arrangements in those countries, and so Europe in 1985 and 1986 is going to be very important to us. In terms of managing growth, it's a challenge, but I think the other thing that needs to be said in that area is that a lot of companies who are in the software business have been financed by venture capital. So what happens is, you have a small to medium company that all of a sudden gets an infusion of five to fifteen million in cash, and very frequently ends up squandering that money. They squander it on product development or advertising and promotion. What we have done, as indicated earlier, is complete internal financing out of the growth of the company, and what that has meant is that our growth, instead of being fueled artificially by large infusions of cash, has been more organic and progressive and logical. So we do the things we can afford to do, and try to do them as efficiently and cost effectively as we possibly can. Whereas we're still growing at an incredible rate, the growth is somewhat under control.

Q. Will Batteries Included ever be releasing any entertainment software?

A. That's a question with which we wrestle on a

daily basis, and on which we haven't come to a firm decision. The entertainment software market, from my perspective, is past its peak. The days of the mega-hit games, and the huge game market are long gone. They've been gone for eight months to a year, and my perspective is that a lot of other publishers just haven't been able to face that reality. We found ourselves in the fortunate situation in which our specialty was, always has been, and probably always will be productivity software, and so the big shake out of 1984 didn't really affect us at all. I mean, what it meant was, instead of our sales being three or four times those of the year previous, they were only double, but those companies that specialized in the games market suffered dramatically because the games market essentially died. So, my feeling now is that the games and entertainment segment of the software market is now just another niche, a small specialty within the broad spectrum of the software market; whereas we currently have no games products we are looking at. Frankly, if we do bring a line of game products out, it will be with a very clear-cut marketing plan. We're looking at what some companies are doing for \$9.95 in the area of games. You bring them out, they sell for a month, and that's the end of it. Then you bring out some more. That's what we would do if we got into it, but we've made no clear-cut decision to do that.

Q. Who distributes your products in Canada, and how difficult is it to get them into retail stores?

A. The key in this industry now is distribution. If you don't have distribution you can have the finest product in the world and the best advertising; you can literally spend megabucks on advertising and promotion for a super product, and it will never get sold because the industry is essentially controlled by the distribution channels. In Canada we have two distributors—Aviva Software, and General Publishing. Aviva specializes in the retail outlets, so they handle everything through outlets ranging from the small local Mom and Pop computer store through to Canadian Tire. General Publishing handles the book trade in places like "WHSMITH," and "CLASSICS," who are now retailing software.

In the U.S. we have something like thirty major distributors, and those are essentially it. Every major distributor in the U.S. carries our product. This includes people like Softsell, Triangle, Warehouse One, Federal Electronics, Eastern Software, CSI Distributing, and so on. They are the ones that deal primarily with the retail outlets. Our products are also handled by some large key accounts such as Toys-R-Us and also through two rack jobbers. The two main rack jobbers are "Handlemans," and "Leberman," and both of them rack Woolworth, Woolco, and Sears outlets. Essentially, our products are available

through every major distribution channel, and something approaching 9,000 retail outlets in the U.S..

Q. I know that with magazines, they shread the copies they can't sell, what do they do with your software?

A. We have a very realistic return policy for distributors. Fortunately, to this date, all of our products sell extremely well, and returns have not been a major problem for us. Then again, there is a difference between the game/entertainment side and the productivity side of the industry. Once a game has passed its peak and is no longer "Hot," and has been extensively pirated, whatever inventory is left on the shelves is pretty well dead; whereas a program like a word processor, or a database manager, or a business graphics package doesn't sell in the huge numbers that a new game might have sold, it still sells in an ongoing steady basis. As long as any given product is a quality product to begin with and competitive in the marketplace in terms of price, functions, and features, that product is going to continue to sell.

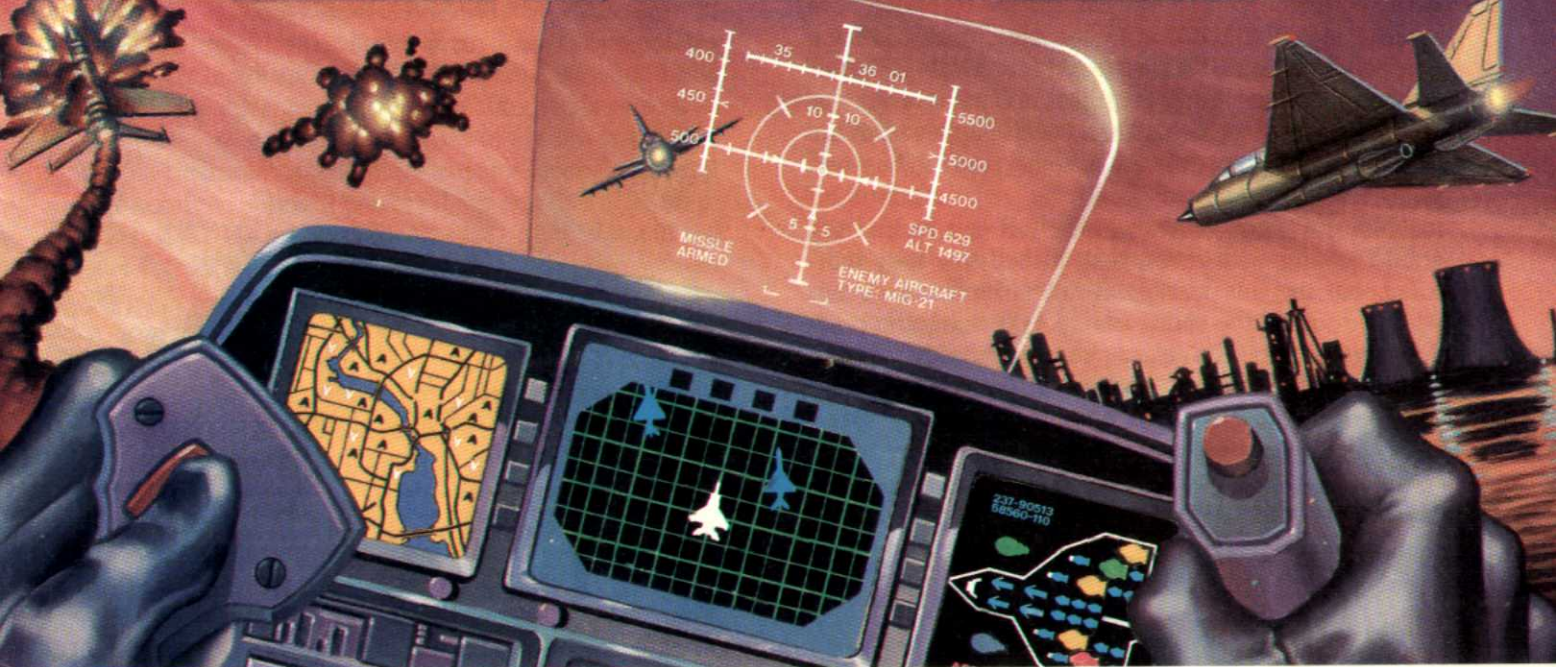
Q. At the very beginning of Batteries Included were all of the programs written inhouse or were they from outside submissions?

A. Well, the way the company started was as a retail computer store. Steve Douglas, who is the author of the Commodore 64 version of "Paperclip," was involved in the company and had a relationship with the owners—Alan and Robbie—and he had started to write a word processor. Then the company gave him some encouragement, and he worked on Paperclip as a sideline while the product grew out of that, and then he went freelance. We have essentially never had programmers on staff in that they were paid a salary and did commercial program development. We have programmers on staff, but the programmers that we have working for us are essentially in the area of product development co-ordination. They work with the programmers in terms of testing and designing product specifications. So, the five people we have working in our product development area are all programmers persay, but none of them are actually sitting down and writing commercial programs. They're working in the area of product development with our contract programmers.

Q. What does Batteries Included have planned for the future?

A. That's tough because as we're talking now, it being the end of January, the WCES is just a few weeks behind us, and basically, we announced our products for the next six months at that time. Specifically for the Atari, we are shipping "Homepack," "B/Graph," and, in another thirty days, "Paperclip." We have been talking about an eighty column card for the Atari but the development of that product is in a bit of a holding pattern at the moment until we

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Canada's Atari (cont'd)

clarify what Atari is going to be doing with regard to the XE's and the parallel bus. Just to explain this in a little more detail for your readers—when we started the development for the eighty column card for the Atari's, which was back around July of '84—what we did was decide that it would plug into the back of the parallel bus of the XLs. It was clear that Atari was not going to bring out the 1090 expansion chassis, so we decided it would go into the parallel bus. This was because the 1090 and the 80-column card that was going to be manufactured by Atari for the 1090 had been canned and it looked like a good opportunity. During the initial three to four months, the development of the product was fairly straight-forward and it was going to work that way. Then, what happened in the late fall was that we heard that the parallel bus was going to be removed from the new Atari 8-bit machines. I went to Atari in the fall and had a very good meeting with them, and at that time they indicated that the bus was going to be removed. Then, what we saw at the show was a slight change in position, and they said "Yes, we're removing the parallel bus, but we're going to expand the cartridge slot and put some additional address lines out of it." Basically, the 80-column card that is on the parallel bus is completed, and it works. The problem is, if we market that product, we're marketing it to a closed envi-



BI's head office in Toronto.

ronment—those people with 800XLs, because the earlier Ataris didn't have the PBI, and the newer XE Ataris don't have the PBI. So, as we speak right now, the fellow who is developing the 80-column card for us and our own hardware engineers are both trying to see if we can make our 80-column card work through the standard cartridge slot on all Ataris. If that can be technically accomplished and manufactured at a marketable price it is going to mean that we'll be able to bring out an 80-column card that will work on all the Ataris ever built. We're very excited about that, and,

if it can be done at a marketable price, I think we will have an excellent product. We should know in another two to three weeks whether this is technically feasible, and then we'll proceed. In the meantime, we're down-playing the 80-column card until we have a better feel for it. That is the fourth Atari product. Other than that, you won't see any Atari products from us until the June CES, and we have a couple of exciting products planned for it, but I can't tell you what they are. However, you can count on at least one Atari ST product from us at the June CES in Chicago.

Thank you very much for the interview, Michael, and I hope we can have a talk like this again.

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Enhancements To Basic

Reviewed by Paul Marter

All you fans of Atari computers know how user friendly Atari BASIC is. But have you ever found that you could use a few more features to help in typing in a program you have written or taken from a magazine? Well, FIRST BYTE has come up with an answer. It is a disk-based machine language program called ENHANCEMENTS TO BASIC. To use this program all you need is a disk drive, DOS 2.0S, at least 48K memory and ATARI BASIC cartridge or the built in BASIC of an 800XL. This utility operates from AUTORUN.SYS file which adds to ATARI BASIC over 20 new direct mode commands as well as eliminates all documented causes of system crashes.

The instructions which accompany the disk are very informative, telling the user all the details of the functions of ENHANCED BASIC disk. They also tell the user the location in memory of this utility, so you do not store a machine language subroutine over it.

Some of the features of the ENHANCED BASIC package are as follows:

1. Error messages have been modified to include an English statement along with the error number to aid in finding out what is wrong with the program or command given.

2. There is a HELP screen available in FULL Enhancements without TRACE which shows the user the proper format of each command.

3. The user can use either decimal or hexadecimal arithmetic by typing the command DEC or HEX respectively.

4. The keyboard can be locked or unlocked by two commands. KEY "xxx" command is the three key sequence to unlock the keyboard. LKB is the command to lock the keyboard to prevent anyone from tampering with your work.

5. There is a command to set the key repeat delay.

6. There are commands to set the left and right margins of the screen.

7. There is a command to eliminate the clicking of the keyboard without turning down the volume of the TV on an 800XL.

Most of the important commands which are included in this package and a small description are as follows:

A) TRACE Commands (available only in Full Enhancements with TRACE)

a) TRON

i) Immediate mode—displays last contents of TRACE screen.

ii) Program mode—TRACE screen is displayed as trace is done.

b) TROFF

i) Immediate mode—cancels TRON and

normal screen display reappears.

ii) Program mode—cancels TRON and program graphics or display screen reappears.

c) LNUMB in TRACE mode causes only line numbers to be displayed by trace.

d) LINE in TRACE mode causes entire line to be displayed by trace.

B) NUM x,y — Auto line numbering.

Starting at line x and incrementing by y.

C) REN x,y,z — renumbering utility.

x is where REN begins.

y is where REN ends.

z is the increment of line numbers between x and y.

D) DEL x,y — multiple line deletion.

x is the starting line number to be deleted.

y is the last line to be deleted.

E) Disk Commands

a) DOS Commands.

i) DIR x where x specifies drive number.

ii) RENAME "D#:OLD,NEW"

iii) LOCK "D#:Filename.ext"

iv) UNLOCK "D#:Filename.ext"

v) ERASE "D#:Filename.ext" (Dos option D)

vi) FORMAT "D#:"

vii) RUNAT# (Dos option M)

b) Deleted File Disk Commands.

i) DDIR directory of deleted disk files.

ii) DRENAME "D#:OLD,NEW" renames old deleted files.

iii) RESOTRE "D#:Filename.ext" restores a deleted file which has not been written over by new data.

c) DOS gives you DOS 2.0S.

d) SINGLE causes the RENAME and DRENAME commands to affect only the first occurrence of filename given in the command.

e) NORMAL cancels the SINGLE command and causes all occurrences to be affected by RENAME or DRENAME commands.

F) Protect Function.

i) PROT alters your program in memory so it is unreadable but still works when it is RUN.

ii) PROT "D#:Filename.ext" Protects your program then saves it to disk under name given where it is only capable of being RUN and not listed or altered.

G) Variable Commands.

i) LVAR command which lists all variable

ETB (cont'd)

names of the program currently in memory. This can be used to find unused variables in a program.

ii) SVAR command which searches a basic program for all lines containing a given variable.

iii) CVAR command which can be used to change the name of any variable you like.

H) DUMP command which sends all output that would be displayed on screen to the printer, giving the user a hard copy of all information found using ENHANCEMENTS TO BASIC.

I) SCREEN command restores output to screen instead of printer.

J) Function Keys.

DEF# "string"

The user is given the ability to define certain key sequences to have a specific meaning.

eg. [ctrl]4 to be defined to mean LOAD "D:"

This key sequence definition function gives the user up to 14 defined keys.

NOTE: The keys used to define functions are the [ctrl], [shift], and 4-9,0 keys.

NOTE: When using the [shift] [ctrl] sequence with 4 through 9 each "string" can be up to 30 characters and with the zero key it can

be up to 62 characters.

NOTE: The function keys using [ctrl] 4-9,0 do not appear to work on my copy of ENHANCEMENTS TO BASIC when in Full Enhancements with TRACE mode.

K) Printer Trace Commands.

i) PTRON—This command enables the user to do a trace in Full Enhancements without TRACE to the printer. Type in PTRON in immediate mode and put a TRON in program mode at start of program then type RUN to do trace.

ii) PTROFF—This command disables the printer trace available in Full Enhancements without TRACE only.

The following is the list of commands available in Half Enhancement mode: RENAME, REN, DIR, RESTORE, LOCK, NUM, DEL, DDIR, DRENAME, UNLOCK, FORMAT, DUMP, SCREEN, ERASE.

Now, after reading about all of the great features FIRST BYTE has included in ENHANCEMENTS TO BASIC, you would probably expect a price of between \$30.00 and \$50.00. But one of the best features of this programming aid is its cost: At only \$14.95 U.S. you really cannot find a better deal anywhere.

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ENHANCEMENTS TO BASIC is a disk based machine language program which combines with ATARI BASIC. It creates an enhanced BASIC which, once created, loads automatically and does not need the BASIC cartridge or built-in 800XL BASIC.

ENHANCEMENTS TO BASIC requires that you have a disk drive, ATARI DOS 2.08, 48K minibus memory, and either the ATARI BASIC cartridge or an 800XL with built in BASIC.

IF YOU PROGRAM ON AN ATARI 800 USING THE BASIC CARTRIDGE, ENHANCEMENTS TO BASIC WILL ELIMINATE THE EDITING LOCKUP PROBLEM WHICH HAS PLAGUED PROGRAMMERS FOR SO MANY YEARS!

ENHANCEMENTS TO BASIC makes over twenty direct mode (and even some program mode) commands available to you to ease your programming efforts.

Most of the DOS commands commonly used by BASIC programmers (DIRECTORY, LOCK, UNLOCK, DELETE, RENAME, and FORMAT) are available from BASIC with no need for the DOS menu.

Even though ENHANCEMENTS TO BASIC resides in RAM instead of ROM, it is safe from SYSTEM RESET and also from pokes into the area of memory where it resides.

TRON and TROFF will allow you to trace the flow of your program for debugging. By using the DUMP command you can even have your program trace printed to your printer while your screen continues to show the program graphics. You can have the trace print line numbers only, or have the entire line printed as it is executed to enable you to follow the program flow more easily. TRON and TROFF are even available in program mode so that you can have the program itself start and stop the trace at selected points by simply inserting the appropriate program line.

ENHANCEMENTS TO BASIC is priced at \$14.95 U.S. (\$21.95 Canadian) including shipping and handling. C.O.D. orders add \$2.00 additional. VISA and MASTERCARD accepted with no surcharge. Remittance in U.S. funds would be appreciated, but Canadian funds will be accepted if more convenient to you, our valued customer. ENHANCEMENTS TO BASIC may be ordered by writing to FIRST BYTE, P.O. BOX 32, RICES LANDING, PA U.S.A. or by calling 412-627-3596 Monday - Friday from 9:00 AM to 4:00 PM EST.

RENUMBER will renumber your programs starting at the line number you choose and using whatever increment you choose. It will renumber all line references except variables, and will print a list of line numbers containing variable \$OTO and \$OBUB etc. statements to either the screen or printer.

PROTECT saves your program in an executable but unreadable format to protect your programming secrets.

RESTORE WILL ENABLE YOU TO RESTORE TO A NORMAL CONDITION ANY ACCIDENTALLY DELETED FILE WHICH HAS NOT BEEN WRITTEN OVER BY NEW DATA!

Error messages are printed as standard English phrases as well as error numbers.

DELETE will delete a range of line numbers. (QUICKLY!!)

VAR will print a list of the variables used in your program to either the screen or the printer to help you find unused variable names which may have crept into your program.

Several other commands are also available to enhance your programming capabilities. Also, several bugs have been fixed in the cartridge version of ATARI BASIC.

WE FEEL CERTAIN THAT YOU WILL BE PLEASED WITH ENHANCEMENTS TO BASIC AND WE MAKE THIS GUARANTEE TO YOU:

IF YOU DO NOT FEEL THAT ENHANCEMENTS TO BASIC IS WORTH THE PRICE YOU PAID, CONTACT US WITHIN 30 DAYS AND WE WILL ARRANGE FOR A FULL REFUND OF YOUR PURCHASE PRICE.

ATARI is a trademark of ATARI, Inc., Sunnyvale, California.

BOOKS ON THE SHELF

by Peter Ellison

At ROM we receive many different books to review. Since it is impossible to review them all, I have selected a few of the more outstanding. A few weeks ago, I received the book, "The ABC's of the Atari Computer," and was quite impressed. Whether you are an XL, an XE, or a 400/800/1200 owner, this book can help you understand more about your computer.

The book starts at "A," going through to "Z," with definitions, examples, and programs, helping everyone from beginners to experts. Each definition is written clearly, and if a program is needed, it will be listed along-side the definition. For example, for the definition AMODEM, the author, David E. Mentley, didn't just explain that it was a public domain terminal program, but gave the complete listing of it. Instead of just knowing how to use the terminal program, you could type it in and run it.

Some of the definitions that I found extremely useful were the following: Collision Register—This gave a complete listing to all of the player/missile graphic memory locations in one easy to understand table; Left-handed Joystick- this tells a person how he or she can convert an ordinary Atari joystick to a lefty model; Printer Tables—helpful to anyone owning a printer because it tells the printer the control code for nearly every available printer—most printer companies usually don't make documentation specifically for the Atari; Screen Editor—this allows the user to use the built-in editing features of the Atari to create his own editor; Sector—an in depth description of a sector so even a neophyte can understand; Sector Examiner—a program that will allow the user to read the contents of any sector on an Atari disk—this can be extremely helpful when fixing disks; Serial Port—the serial port on the Atari is used to input from, and output to peripheral devices such as disk drives, cassette recorders, and printers. The book has a diagram and explains which pin does what on the port; Setcolor—explains Setcolor 0-4, and which playfield is affected; XIO—a table explaining each command it can be used for; and XL Series Memory Usage Changes—several variables in the database area have been changed in the XL series operating system, and a table is given telling of all the changes.

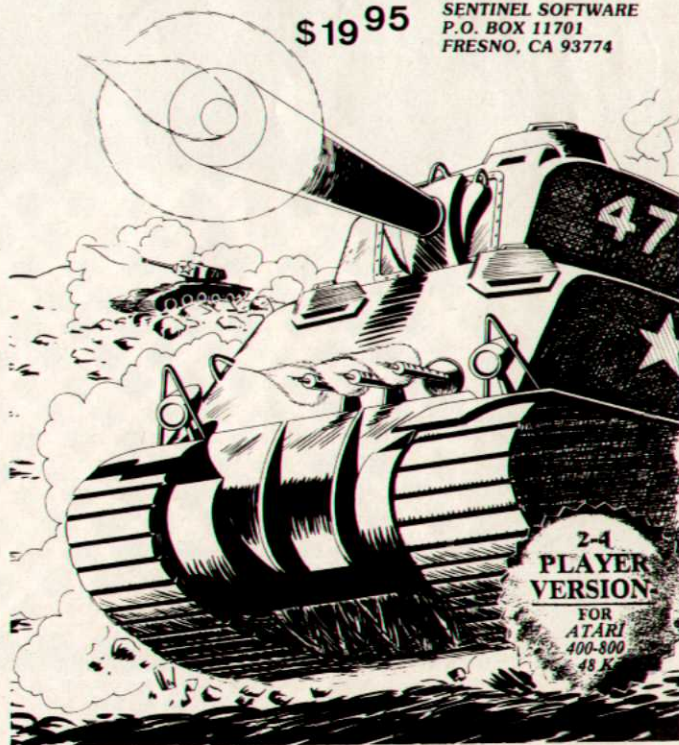
This book, besides having good program listings and definitions, has some very informative and amusing illustrations. For a suggested retail price of \$14.95, this book should be added to every Atari User's collection. It can be purchased directly from:

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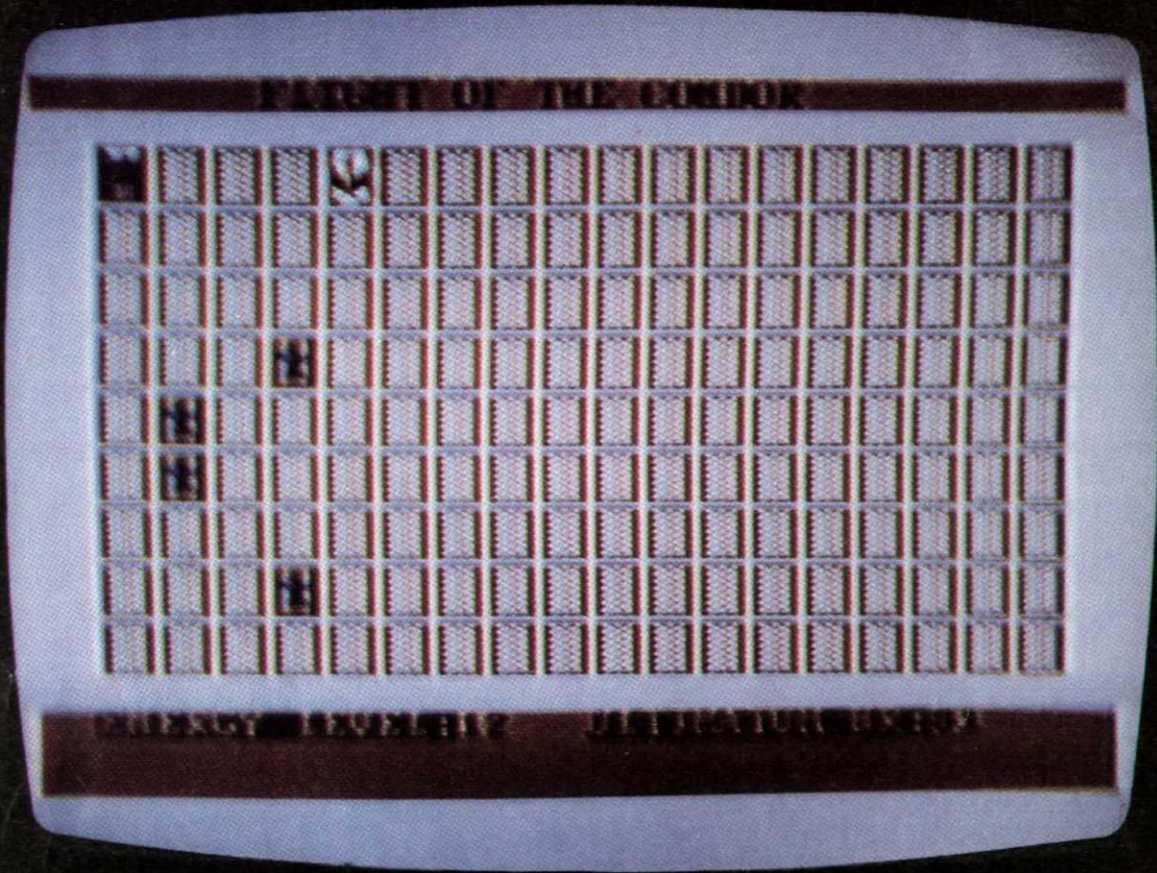
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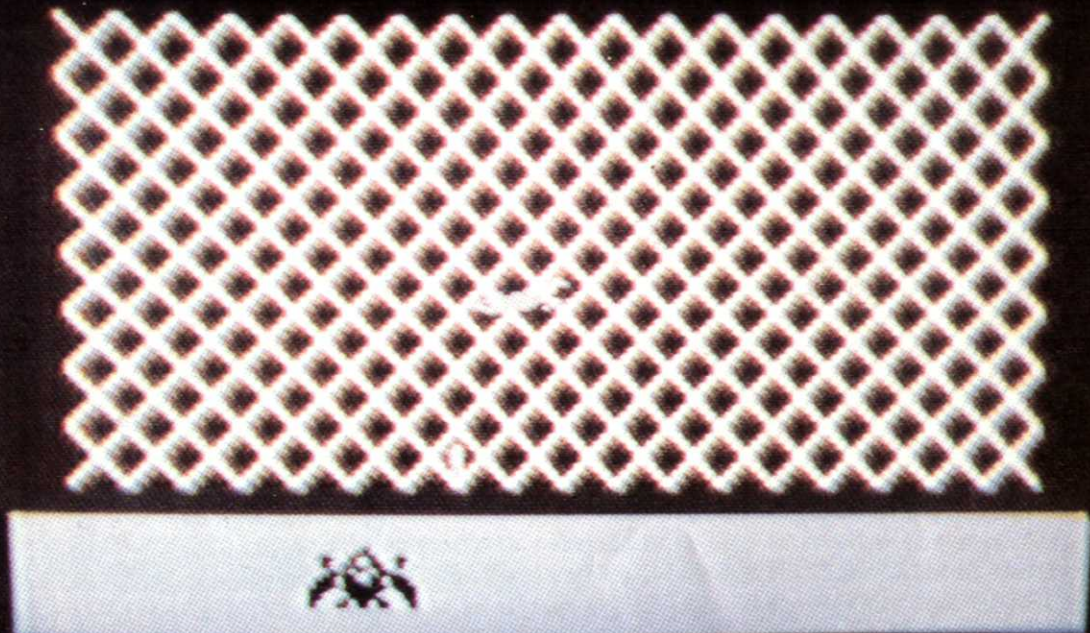


FLIGHT OF THE CONDOR

by Jack Chung



TACTICAL



"Flight of the Condor" is a futuristic, strategic, and arcade action machine language game. The game requires one joystick and an Atari 400/800 computer.

When the game is run, it asks you a number of questions before you begin playing. The first is how many refuelling castles you want. This can be from one to ten, depending how lucky you feel. If you pick zero, you will still have one because in the top left hand corner of the strategic screen there is always a refuelling castle. The next question asks you how many Vulture squadrons you wish to fight, where ten is the hardest, and one is the easiest. The third question that needs to be resolved is the Vulture Difficulty. This is from one to seven, where one is the easiest, and seven is the most difficult. This skill level makes the Vultures fly higher (easy level), or lower (difficult level), depending on the skill level chosen. The last question that the computer asks you is what you want the Doom's-Day Hour to be. This can be from one to ninety-nine, depending on how difficult you want to make it for yourself. The Doom's-Day Hour, or Ultimatum Hour, is the amount of turns you have before the Vultures overrun your planet.

The game is actually two games in one. The first screen which appears is called the strategic screen and contains 162 squares or sectors. In each one is either nothing, a refuelling castle, or a Vulture. By moving your Condor with the joystick you can examine each sector. Each time you move one square you lose one energy point. If your energy points go below one, your game is over. To make this game a little easier, you have a scanner in which you can look at the contents of a sector without actually moving to it. Your scanner is activated by pressing your space bar. A cross will appear on the screen, and you can now move it to whichever sector that you wish to examine. Once it's on the sector you wish to look at, press your button. This will then tell you what is in it. To use your scanner will cost only one energy point, so you can check sectors that are far away without it being too costly.

If, when moving your bird, you encounter another bird figure, you will enter into what I call the Tactical phase of the game. This is where the combat takes place between you and the Vultures. Your bird appears at the bottom of the screen while the Vulture swoops down from above, dropping boulders, trying to hit you. Whatever your energy was before you entered the sector determines the amount of hits you can take before being destroyed. You are able to move your Condor left and right to dodge the Vulture fire. To fire back at the Vulture, press your joystick button and direct your bullets by moving your joystick either left or right. The only way to leave an enemy sector is either by destroying the enemy or by being killed.

The game is won when you have killed all of the Vultures or lost when your energy level runs out. The game is quite enjoyable, and I hope you have a good time playing it.

It uses redefined characters to draw all the graphics in the strategic screen. In the Tactical screen, animated player/missile graphics are used. Also, a short assembly language subroutine is used to speed up the graphics in the Tactical phase of the game. The game is split up into four programs. The first program loads in the character set, the second program is the machine code in the form of data statements, and the third is the initialization and main part of the game. Save the first one as LCHAR.BAS, the second as LMAIN.BAS, and the third as MAIN. Then TYPE 'D:LCHAR.BAS' and it will run the program. If you have a cassette, change line 20 from RUN 'D:' to RUN 'C:' in program one and two. You have to save it also as SAVE 'C:' and then to run it type RUN 'C:'. The fourth listing is the assembler code. You Don't need this to run the program. It is only listed so you can have a better understanding of what the program is doing.

This game can be acquired by sending \$3.00 U.S. and a blank disk or cassette to:

ROM MAGAZINE
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Maple Ridge, B.C.
V2X 7G1

```
10 REM READ IN CHARACTER SET
20 FOR I=34816 TO 35840:READ X:POKE I,
X:NEXT I:RUN "D:LMAIN.BAS"
1000 DATA 0,0,0,0,0,0,0,0,0,24,24,2
4,0,24,0,0,102,102,102,0,0,0,0
1010 DATA 0,102,255,102,102,255,102,0,
24,62,96,60,6,124,24,0,0,102,108,24,48
,102,70,0
1020 DATA 28,54,28,56,111,102,59,0,0,2
4,24,24,0,0,0,0,14,28,24,24,28,14,0
1030 DATA 0,112,56,24,24,56,112,0,0,10
2,60,255,60,102,0,0,0,24,24,126,24,24,
0,0
1040 DATA 0,0,0,0,0,24,24,48,0,0,0,126
,0,0,0,0,0,0,0,0,24,24,0
1050 DATA 0,6,12,24,48,96,64,0,0,60,10
2,110,118,102,60,0,0,24,56,24,24,12
6,0
1060 DATA 0,60,102,12,24,48,126,0,0,12
6,12,24,12,102,60,0,0,12,28,60,108,126
,12,0
1070 DATA 0,126,96,124,6,102,60,0,0,60
,96,124,102,102,60,0,0,126,6,12,24,48,
48,0
1080 DATA 0,60,102,60,102,102,60,0,0,6
0,102,62,6,12,56,0,0,0,24,24,0,24,24,0
1090 DATA 0,0,24,24,0,24,24,48,6,12,24
,48,24,12,6,0,0,0,126,0,0,126,0,0
1100 DATA 96,48,24,12,24,48,96,0,0,60,
102,12,24,0,24,0,0,60,102,110,110,96,6
2,0
1110 DATA 48,120,204,252,204,204,238,0
,252,102,102,124,102,102,252,0,124,198
,192,192,192,198,124,0
1120 DATA 252,102,102,102,102,102,252,
0,254,102,96,120,96,102,254,0,254,102,
96,120,96,96,240,0
1130 DATA 124,198,192,192,206,198,124,
0,238,204,204,252,204,204,238,0,126,90
,24,24,24,90,126,0
1140 DATA 30,12,12,12,12,204,120,0,115
```

,54,60,56,60,54,115,0,120,48,48,48,48,
54,126,0
1150 DATA 198,238,254,214,198,198,231,
0,204,236,252,220,204,204,238,0,124,19
8,198,198,198,198,124,0
1160 DATA 252,102,102,102,124,96,224,0
,124,198,198,198,198,204,118,0,252,102
,102,124,120,108,230,0
1170 DATA 124,198,192,124,6,198,124,0,
255,153,24,24,24,24,60,0,238,204,204,2
04,204,204,120,0
1180 DATA 238,204,204,204,204,120,48,0
,231,198,198,214,254,238,198,0,195,102
,60,24,60,102,195,0
1190 DATA 238,204,204,120,48,48,120,0,
254,198,12,24,48,102,254,0,0,30,24,24,
24,24,30,0
1200 DATA 0,64,96,48,24,12,6,0,0,120,2
4,24,24,24,120,0,0,0,28,54,99,0,0,0
1210 DATA 0,0,0,0,0,255,0,0,54,127,1
27,62,28,8,0,21,16,24,26,30,26,26,26
1220 DATA 85,1,137,169,237,169,169,169
,26,26,27,27,27,21,0,169,169,249,24
9,249,249,85,0
1230 DATA 21,31,31,31,30,27,26,30,85,2
53,253,189,189,185,169,173,31,31,30,30
,31,31,21,0
1240 DATA 189,189,173,237,253,253,85,0
,21,18,24,18,24,18,24,18,85,33,137,33,
137,33,137,33
1250 DATA 24,18,24,18,24,18,21,0,137,3
3,137,33,137,33,85,0,42,32,32,33,32,36
,36,37
1260 DATA 170,2,194,66,66,70,70,214,37
,37,33,32,33,36,42,0,214,214,210,66,18
,6,170,0
1270 DATA 2,2,2,2,2,2,42,47,160,224,22
4,224,224,224,234,254,42,2,2,2,2,2,0
1280 DATA 234,224,224,224,224,224,160,
0,192,192,48,48,12,12,3,3,3,12,12,48
,48,192,192
1290 DATA 3,3,12,12,48,48,192,192,192,
192,48,48,12,12,3,3,240,240,240,240,24
0,240,240,240
1300 DATA 24,24,24,31,31,0,0,0,120,96,
120,96,126,24,30,0,0,24,60,126,24,24,2
4,0
1310 DATA 0,24,24,24,126,60,24,0,0,24,
48,126,48,24,0,0,0,24,12,12,24,0,0
1320 DATA 0,24,60,126,126,60,24,0,0,0,
60,6,62,102,62,0,0,112,96,124,102,102,
124,0
1330 DATA 0,0,60,96,96,96,60,0,0,14,6,
62,102,102,62,0,0,0,60,102,126,96,60,0
1340 DATA 0,14,24,62,24,24,60,0,0,0,62
,102,102,62,6,124,0,112,96,124,102,102
,119,0
1350 DATA 0,24,0,56,24,24,60,0,0,12,0,
28,12,12,12,120,0,112,96,108,120,108,1
02,0
1360 DATA 0,56,24,24,24,24,60,0,0,10
2,127,127,107,99,0,0,0,124,102,102,102
,102,0
1370 DATA 0,0,60,102,102,102,60,0,0,0,
124,102,102,124,96,112,0,0,62,102,102,
62,6,14
1380 DATA 0,0,124,102,96,96,96,0,0,0,6
2,96,60,6,124,0,0,24,126,24,24,14,0
1390 DATA 0,0,102,102,102,102,62,0,0,0,
,102,102,102,60,24,0,0,0,99,107,127,62
,54,0
1400 DATA 0,0,102,60,24,60,102,0,0,0,1
02,102,102,62,12,120,0,0,126,12,24,48,
126,0
1410 DATA 0,24,60,126,126,24,60,0,24,2
4,24,24,24,24,24,0,126,120,124,110,
102,6,0
1420 DATA 8,24,56,120,56,24,8,0,16,24,
28,30,28,24,16,0,0

10 REM READ IN MACHINE LANGUAGE PROGRA
M
20 FOR I=20480 TO 21341:READ X:POKE I,
X:NEXT I:RUN "D:MAIN"
1000 DATA 104,173,1,6,141,199,2,173,0,
6,10,10,10,10,24,105,8,141,192,2,141,1
93,2,141
1010 DATA 2,6,173,0,6,10,10,10,10,141,
182,82,162,158,142,3,208,169,1,141,77,
82,169,112
1020 DATA 141,190,81,169,100,141,191,8
1,160,153,162,80,169,7,32,92,228,169,1
92,141,14,212,169,58
1030 DATA 141,47,2,169,3,141,29,208,16

9,96,141,7,212,160,9,152,153,0,100,153
,0,101,153,0
1040 DATA 99,153,0,102,153,0,103,200,2
08,238,160,200,162,0,189,45,83,153,0,1
02,189,61,83,153
1050 DATA 0,103,200,232,224,16,144,238
,169,1,141,111,2,169,120,141,13,82,173
,1,6,208,1,96
1060 DATA 173,2,6,16,1,96,76,138,80,17
3,252,2,201,33,208,3,76,98,228,238,186
,81,173,186
1070 DATA 81,205,182,82,144,19,169,0,1
41,186,81,169,3,32,61,82,24,105,1,141,
77,82,76,196
1080 DATA 80,32,18,81,32,106,81,32,14,
82,173,183,82,240,6,32,185,82,76,237,8
0,173,132,2
1090 DATA 208,19,169,1,141,183,82,173,
13,82,24,105,8,141,5,208,169,190,141,1
84,82,173,181,82
1100 DATA 240,6,32,92,82,76,15,81,169,
1,141,181,82,173,190,81,24,105,8,141,4
,208,173,191
1110 DATA 81,24,105,9,141,180,82,76,98
,228,174,77,82,224,1,208,13,173,191,81
,201,40,144,6
1120 DATA 56,233,2,141,191,81,224,2,20
8,13,173,191,81,201,180,176,6,24,105,2
,141,191,81,224
1130 DATA 3,208,21,173,190,81,201,50,1
76,8,169,200,141,190,81,76,80,81,56,23
3,1,141,190,81
1140 DATA 224,4,208,21,173,190,81,201,
200,144,8,169,50,141,190,81,76,105,81,
24,105,1,141,190
1150 DATA 81,96,173,190,81,141,0,208,2
4,105,8,141,1,208,172,191,81,174,187,8
1,238,188,81,173
1160 DATA 188,81,201,30,144,22,169,0,1
41,188,81,224,16,208,8,162,0,142,187,8
1,76,156,81,162
1170 DATA 16,142,187,81,189,205,81,153
,0,100,189,237,81,153,0,101,200,232,23
8,189,81,173,189,81
1180 DATA 201,16,144,232,169,0,141,189
,81,96,1,0,21,0,142,106,0,0,0,129,66,3
6,24,24
1190 DATA 36,66,129,0,0,0,0,0,3,15,63,
127,195,93,15,31,12,0,0,0,0,0,0,0
1200 DATA 0,0,0,0,0,29,15,31,111,63,31
,0,0,0,0,0,192,230,239,220,252,248,240
,187
1210 DATA 4,8,0,0,0,0,0,0,0,6,15,28,12
4,248,240,251,228,200,0,0,0,145,174,0
1220 DATA 211,138,41,4,208,9,173,13,82
,56,233,1,141,13,82,138,41,8,208,9,173
,13,82,24
1230 DATA 105,1,141,13,82,173,13,82,14
1,2,208,24,105,8,141,3,208,141,5,208,9
6,141,76,82
1240 DATA 238,76,82,173,10,210,205,76,
82,176,248,96,4,2,169,0,160,0,153,0,10
0,153,0,101
1250 DATA 200,208,247,96,173,8,208,240
,29,169,0,141,181,82,169,1,141,30,208,
169,0,168,153,0
1260 DATA 99,200,208,250,206,1,6,173,1
,6,141,199,2,96,173,180,82,24,109,0,6,
105,1,141
1270 DATA 180,82,162,0,172,180,82,192,
240,144,6,169,0,141,181,82,96,169,0,16
2,0,153,0,99
1280 DATA 200,232,224,8,144,247,162,0,
200,169,2,153,0,99,232,224,8,144,245,9
6,159,1,16,0
1290 DATA 7,173,9,208,240,41,169,0,141
,183,82,168,153,0,99,200,208,250,169,1
,141,30,208,173
1300 DATA 2,6,248,233,16,141,2,6,141,1
92,2,141,193,2,169,0,141,0,210,141,1,2
10,96,173
1310 DATA 184,82,141,0,210,173,184,82,
141,1,210,162,0,172,184,82,192,10,176,
12,169,0,141,183
1320 DATA 82,141,0,210,141,1,210,96,16
9,0,162,0,153,0,99,200,232,224,10,144,
247,173,184,82
1330 DATA 56,233,3,141,184,82,168,162,
0,200,169,4,153,0,99,232,224,8,144,245
,96,0,1,35
1340 DATA 114,38,39,29,62,118,119,255,
231,195,199,141,141,128,128,196,78,100
,228,184,124,110,238,255
1350 DATA 231,195,227,177,177,0,0,0,0,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0


```

11020 POSITION 8,10:? "YOU DESTROYED TH
E      ":GOSUB 32000
11030 POSITION 8,10:? "FLEET AND SAVE
OUR    ":GOSUB 32000
11040 POSITION 8,10:? "WORLD.  NO REWA
RD     ":GOSUB 32000
11050 POSITION 8,10:? "CAN REPRESENT 0
UR     ":GOSUB 32000
11060 POSITION 8,10:? "APPRECIATION 50
":GOSUB 32000
11070 POSITION 8,10:? "ALL I CAN DO IS
SAY   ":GOSUB 32000
11080 POSITION 8,10:? "THANKS!
":GOSUB 32000
11090 POSITION 8,10:? "PRESS ANY KEY T
O START":GOSUB 32000
11100 IF PEEK(764)=255 THEN 11100
11110 GOTO 2
20000 GRAPHICS 0:SETCOLOR 2,0,0:POKE 7
52,1:SETCOLOR 1,0,0:POKE 756,PEEK(106)
-24
20010 POSITION 5,10:? "      FLIGHT OF T
HE CONDOR":GOSUB 32000
20020 POSITION 5,10:? "      BY JACK
CHUNG  ":GOSUB 32000
20030 POSITION 5,10:? "
":SETCOLOR 1,0,8:RETURN
32000 FOR I=0 TO 15 STEP 0.1:SETCOLCR
1,0,I:NEXT I:FOR T=1 TO 200:NEXT T:SET
COLOR 1,0,0:RETURN

```

Check Data

```

0 REM CHECK DATA FOR PROGRAM ONE OF
THE FLIGHT OF THE CONDOR
10 DATA 6725,964,131,425,333,844,22,24
3,45,125,103,866,635,44,6,799,833,307
1150 DATA 8950,130,15,718,888,409,755,
795,707,476,619,232,335,893,484,573,36
,885
1320 DATA 3979,127,905,180,73,176,209,
916,116,100,231,946

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```

0 REM CHECK DATA FOR PROGRAM TWO OF
THE FLIGHT OF THE CONDOR
10 DATA 10524,734,778,292,417,957,508,
723,560,528,568,504,764,548,605,675,64
0,723
1150 DATA 9515,768,707,910,268,641,81,
830,390,477,478,701,387,554,540,701,35
8,724
1320 DATA 1463,617,447,175,224

```

```

0 REM CHECK DATA FOR PROGRAM THREE OF
THE FLIGHT OF THE CONDOR
1 DATA 11015,339,531,926,918,969,813,7
12,865,645,393,275,732,713,641,394,416
,733
50 DATA 9091,227,541,872,70,983,855,25
6,64,840,913,769,587,849,879,268,61,57
240 DATA 11444,955,3,939,826,999,886,3
79,724,770,750,590,262,693,554,452,825
,837
501 DATA 8146,655,100,816,145,37,835,7
91,565,283,334,113,930,485,34,610,813,
600
1050 DATA 8824,859,920,824,846,609,47,
454,927,2,992,253,391,368,375,371,269,
317
3160 DATA 10638,253,140,313,200,786,63
9,817,927,638,656,914,645,494,919,501,
903,893
10012 DATA 12372,917,823,730,665,645,7
55,765,768,736,965,825,920,502,904,426
,508,518
11040 DATA 7498,471,544,482,466,141,78
7,967,826,902,722,451,668,71

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Assembler Listing

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00010      .LI OFF
00011 *****
00012 * FLIGHT OF THE CONDOR *
00013 *   BY JACK CHUNG   *
00014 *                   *
00015 *   CO. 1985       *
00017 * ASSEMBLY LANGUAGE *
00018 * SUBROUTINE      *
00019 *****
00050 RANDOM      .EQ $D200
00060 SOUND      .EQ $D200
00070 VERTI      .EQ $200

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```

00080 DMACTL      .EQ $22F
00090 DLST       .EQ $230
00100 GRACL      .EQ $D01D
00110 PMBASE     .EQ $D407
00120 COLPM0     .EQ $D012
00130 HPOSPO     .EQ $D000
00140 STICK      .EQ $D300
00150 TRIG0      .EQ $D010
00160 NMIE      .EQ $D40E
00170
00180 ADR         .EQ $80
00190
00200           .OR $5000
00210 RIGHT      .EQ $8
00220 LEFT       .EQ $4
00230 DOWN       .EQ $2
00240 UP         .EQ $1
00250 HSPEED     .EQ 1
00260 VSPEED     .EQ 2
00270 LEVEL      .EQ 1536
00280
00290 PLAYER     .EQ $6000
00300
00320 START      PLA
00340           LDA YOURCOLOR
00350           STA 711
00360           LDA LEVEL
00380           ASL
00390           ASL
00400           ASL
00410           ASL
00420           CLC
00430           ADC #8
00440           STA 704
00450           STA 705
00460           STA EAGLECOLOR
00470           LDA LEVEL
00480           ASL
00490           ASL
00500           ASL
00510           ASL
00520           STA DISTMAX
00530           LDX #158
00540           STX 53251
00541           LDA #1
00542           STA DIR
00543           LDA #112
00544           STA 0X
00545           LDA #100
00546           STA 0Y
00620           LDY #MAIN
00630           LDX /MAIN
00640           LDA #507
00650           JSR $E45C
00660           LDA #192
00670           STA NMIE
00680           LDA #53A
00690           STA DMACTL
00700           LDA #503
00710           STA GRACL
00720           LDA /PLAYER
00730           STA PMBASE
00740           LDY #0
00750           TYA
00760           .1 STA PLAYER+$400,Y
00770           STA PLAYER+$500,Y
00780           STA PLAYER+$300,Y
00790           STA PLAYER+$600,Y
00800           STA PLAYER+$700,Y
00810           INY
00820           BNE .1
00830           LDY #200
00840           LDX #0
00850           .2 LDA YOURSHAPE,X
00860           STA PLAYER+$600,Y
00870           LDA YOURSHAPE1,X
00880           STA PLAYER+$700,Y
00890           INY
00900           INX
00910           CPX #16
00920           BCC .2
00930           LDA #1
00940           STA 623
00950           LDA #120
00960           STA MX
00970           LOOP LDA YOURCOLOR
00971           BNE NOTDEAD
00972           RTS
00973           NOTDEAD LDA EAGLECOLOR
00974           BPL EALIVE
00975           RTS
00980           EALIVE JMP LOOP
00990
01060           MAIN LDA 764
01061           CMP #33

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Assembler Listing (cont'd)

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01062      BNE NOSTOP
01063      JMP SE462
01069      NOSTOP INC DISTANCE
01070      LDA DISTANCE
01080      CMP DISTMAX
01090      BCC .1
01100      LDA #0
01110      STA DISTANCE
01120      LDA #3
01130      JSR RND
01140      CLC
01150      ADC #1
01160      STA DIR
01170      JMP .2
01180      .1 JSR RSTICK
01190      .2 JSR MOVE
01200      JSR YSTICK
01210      LDA YMISSLEON
01220      BEQ .22
01230      JSR YMISSLE
01240      JMP .33
01250      .22 LDA 644
01260      BNE .33
01270      LDA #1
01280      STA YMISSLEON
01290      LDA MX
01300      CLC
01310      ADC #8
01320      STA 53253
01330      LDA #190
01340      STA YMISSLEY
01350      .33 LDA MISSLEON
01360      BEQ .3
01370      JSR MISSLE
01380      JMP .4
01390      .3 LDA #1
01400      STA MISSLEON
01410      LDA 0X
01420      CLC
01430      ADC #8
01440      STA 53252
01450      LDA 0Y
01460      CLC
01470      ADC #9
01480      STA MISSLEY
01490      .4 JMP SE462
01560
01570      RSTICK LDX DIR
01580      CPX #1
01590      BNE .1
01600      LDA 0Y
01610      CMP #40
01620      BCC .1
01630      SEC
01640      SBC #HSPEED
01650      STA 0Y
01660      .1 CPX #2
01670      BNE .2
01680      LDA 0Y
01690      CMP #180
01700      BCS .2
01710      CLC
01720      ADC #HSPEED
01730      STA 0Y
01740      .2 CPX #3
01750      BNE .3
01760      LDA 0X
01770      CMP #50
01780      BCS .33
01790      LDA #200
01800      STA 0X
01810      JMP .3
01820      .33 SEC
01830      SBC #HSPEED
01840      STA 0X
01850      .3 CPX #4
01860      BNE .4
01870      LDA 0X
01880      CMP #200
01890      BCC .44
01900      LDA #50
01910      STA 0X
01920      JMP .4
01930      .44 CLC
01940      ADC #HSPEED
01950      STA 0X
01960      .4 RTS
01970
01980      MOVE LDA 0X
01990      STA HPOSPO
02000      CLC
02010      ADC #8
02020      STA HPOSPO+1
02030      LDY 0Y
02040      LDX WSHAPE
02050      INC SLOW
02060      LDA SLOW
02070      CMP #30
02080      BCC M00
02090      LDA #0
02100      STA SLOW
02110      CPX #16
02120      BNE TAR
02130      LDX #0
02140      STX WSHAPE
02150      JMP M00
02160      .1 TAR LDX #16
02170      STX WSHAPE
02180      .2 M00 LDA EAGLESHAPE,X
02190      STA PLAYER+$400,Y
02200      LDA EAGLESHAPE1,X
02210      STA PLAYER+$500,Y
02220      INY
02230      IMX
02240      INC COUNT
02250      LDA COUNT
02260      CMP #16
02270      BCC M00
02280      LDA #0
02290      STA COUNT
02300      RTS
02310
02320      DISTANCE .DA #0
02330      WSHAPE .DA #0
02340      SLOW .DA #0
02350      COUNT .DA #0
02360      OK .DA #112
02370      OY .DA #100
02380      FRAME .H5 00
02390      SHAPE .H5 0000814224181824428
10000
02400      SLEN .EQ *-SHAPE-1
02410      EAGLESHAPE
02420      .DA #0,#0,#0,#3,#15,#63,#127,#1
95,#193,#15,#31,#12,#0,#0,#0
02430      .DA #0,#0,#0,#0,#0,#0,#0,#29
,#15,#31,#111,#63,#31,#0,#0
02440      EAGLESHAPE1
02450      .DA #0,#0,#0,#192,#230,#239,#22
0,#252,#248,#240,#187,#4,#8,#0,#0
02460      .DA #0,#0,#0,#0,#6,#15,#28,#124
,#248,#240,#251,#228,#200,#0,#0
02470      ;
02480      ;
02490      MX .DA #0
02500      ;
02510      YSTICK LDX STICK
02520      .2 TXA
02530      AND #LEFT
02540      BNE .3
02550      LDA MX
02560      SEC
02570      SBC #HSPEED
02580      STA MX
02590      .3 TXA
02600      AND #RIGHT
02610      BNE .4
02620      LDA MX
02630      CLC
02640      ADC #HSPEED
02650      STA MX
02660      .4 LDA MX
02670      STA 53250
02680      CLC
02690      ADC #8
02700      STA 53251
02701      STA 53253
02710      RTS
02720      RND STA RTEMP
02730      INC RTEMP
02740      RNDWAIT LDA RANDOM
02750      CMP RTEMP
02760      BCS RNDWAIT
02770      RTS
02780      RTEMP .DA #0
02790      DIR .DA #1
02800      ;
02810      ;
02820      CLEAR LDA #0
02830      LDY #0
02840      CLEARP STA PLAYER+$400,Y
02850      STA PLAYER+$500,Y
02860      INY
02870      BNE CLEARP
02880      RTS
02890      MISSLE LDA 53256
02900      BEQ FU1
02910      LDA #0

```

Assembler Listing (cont'd)

```

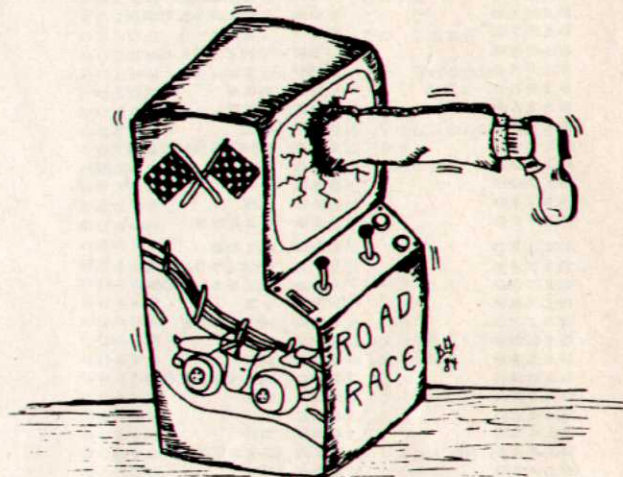
02920 STA MISSLEON
02930 LDA #1
02940 STA 53278
02950 LDA #8
02960 TAY
02970 CL1 STA PLAYER+$300,Y
02980 INY
02990 BNE CL1
02991 DEC YOURCOLOR
02992 LDA YOURCOLOR
02993 STA 711
03000 RTS
03010 FU1 LDA MISSLEY
03020 CLC
03030 ADC LEVEL
03040 ADC #1
03050 STA MISSLEY
03060 LDX #8
03070 LDY MISSLEY
03080 CPY #248
03090 BCC .1
03100 LDA #8
03110 STA MISSLEON
03120 RTS
03130 .1 LDA #8
03140 LDX #8
03150 .11 STA PLAYER+$300,Y
03160 INY
03170 INX
03180 CPX #8
03190 BCC .11
03200 LDX #8
03210 .2 INY
03220 LDA #2
03230 STA PLAYER+$300,Y
03240 INX
03250 CPX #8
03260 BCC .2
03270 RTS
03280 ;
03290 MISSLEY .DA #8
03300 MISSLEON .DA #8
03310 DISTMAX .DA #8
03320 YMISSLEON .DA #8
03330 YMISSLEY .DA #8
03340 ;
03350 ;
03360 ;
03370 YMISSLE LDA 53257
03380 BEQ NOTHIT
03390 LDA #8
03400 STA YMISSLEON
03410 TAY
03420 CLEARY STA PLAYER+$300,Y
03430 INY
03440 BNE CLEARY
03450 LDA #1
03460 STA 53278
03470 LDA EAGLECOLOR
03480 SED
03490 SBC #16
03500 STA EAGLECOLOR
03510 STA 704
03520 STA 705
03521 LDA #8
03522 STA SOUND
03523 STA SOUND+1
03530 RTS
03540 NOTHIT LDA YMISSLEY
03541 STA SOUND
03542 LDA YMISSLEY
03543 STA SOUND+1
03549 LDX #8
03550 LDY YMISSLEY
03560 CPY #18
03570 BCS .1
03580 LDA #8
03590 STA YMISSLEON
03591 STA SOUND
03592 STA SOUND+1
03600 RTS
03610 .1 LDA #8
03620 LDX #8
03630 .11 STA PLAYER+$300,Y
03640 INY
03650 INX
03660 CPX #18
03670 BCC .11
03680 LDA YMISSLEY
03690 SEC
03700 SBC #3
03710 STA YMISSLEY
03720 TAY
03730 LDX #8
03740 .2 INY

```

```

03750 LDA #4
03760 STA PLAYER+$300,Y
03770 INX
03780 CPX #8
03790 BCC .2
03800 RTS
03810 EAGLECOLOR .EQ 1538
03820 YOURCOLOR .EQ 1537
31000 YOURSHAPE
32000 .DA #8,#1,#35,#114,#38,#39,#29,
#62,#118,#119,#255,#231,#195,#199,#141,
#141
32001 YOURSHAPE1
32010 .DA #128,#128,#196,#78,#100,#22
8,#164,#124,#110,#238,#255,#231,#195,#
227,#177,#177

```



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on the brake!!!

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Atari's Sound System

by Bob Cockroft

Sound on the Atari computer is generated by the POKEY chip. There are 4 independent channels (or speakers) for sound creation. Because each channel can be controlled independently, 4 different sounds can be generated simultaneously. For example, one channel could play the melody of a tune while another played the base.

The sound system is manipulated by 9 bytes. The first 8 bytes are the Audio Frequency and Control Registers for each of the 4 channels. The last byte, called Audio Control (AUDCTL), alters sound for all 4 channels. Below, table 1 provides the names and addresses of these bytes. It may be helpful to refer back periodically to this table.

Table 1

Sound Control Locations

Name	(Symbol)	loc. dec/hex
Channel 1 frequency	(AUDF1)	53760/D200
Channel 1 control	(AUDC1)	53761/D201
Channel 2 frequency	(AUDF2)	53762/D202
Channel 2 control	(AUDC2)	53763/D203
Channel 3 frequency	(AUDF3)	53764/D204
Channel 3 control	(AUDC3)	53765/D205
Channel 4 frequency	(AUDF4)	53766/D206
Channel 4 control	(AUDC4)	53767/D207
Audio Control Byte	(AUDCTL)	53768/D208

The Clocks

The foundation of the sound system is the internal clock. This clock is able to send thousands, or even millions, of electronic pulses to the sound system every second. The rate of these pulses determines the standard frequency for sound generation. Faster clock rates produce higher pitch sounds than do slower clock rates. The clock can be set by the user at frequencies of 15 KHz, 64 KHz and 1.79 MHz.(see below)

15 KHz = 15,000 pulses per second
 64 KHz = 64,000 pulses per second
 1.79 MHz = 1,790,000 pulses per second

Frequency Registers (AUDF1-4)

As mentioned earlier, each of the 4 channels has a Frequency Register. The Frequency Registers determine the percentage of clock pulses that will be used in the creation of the audio frequency. The computer divides the clock rate by the value in the Frequency Register to determine the audio frequency. For example, suppose the clock rate is 64 KHz, and the Frequency Register is '8.'(see below)

64,000 Hz 64 KHz

$$\text{(Hertz)} \quad \frac{64,000 \text{ Hz}}{\text{Freq Reg} = 8} = 8,000 \text{ Hz}$$

In the above example, the audio frequency would be 8,000 pulses a second (8 KHz). The higher the frequency, the higher will be the pitch of the sound it produces.

Control Registers (AUDC1-4)

Each Frequency Register has a corresponding Control Register. As a multi purpose byte, the Control Registers set both the distortion and volume for each audio channel. Although the 4 Control Registers manipulate their own audio channel, they use the same bit structure as displayed below.

AUDC1-4

Distortion			Vol only	Volume			
7	6	5	4	3	2	1	0

The Control Register bytes consist of 3 sections: distortion, 'volume only,' and volume. For simplicity, each of the 3 sections will be examined independently.

Distortion

Distortion is a measure of variance from a pure tone. For example, the rumble from a car engine is much more distorted than is a note played by a musical instrument. Distortion is used to alter a pure tone so that special sound effects can be created. The 3 high bits of a Control Register determine audio distortion.

The Atari computer contains 3 generators of some-

what random numbers, called Polys. Having lengths of 4, 5, and 17 bits, these Polys vary in their proximity to randomness. The longer Polys are much more random than are the shorter ones. Distortion is attained by 'mixing' the regular pulses from the Audio Frequency with the random pulses from the Poly. As a result, the 17 bit poly tends to produce a more irregular (rushing) sound, whereas the 4 bit poly tends to produce a more systematic (idling) sound. Below, is a partial display of the Control Register bit configuration and the corresponding polys.

Table 2

Bit Configuration(for poly(s))

AUDC1-4

7	6	5	not used for distortion
0	0	0	5 bit then 17 bit poly
0	0	1	5 bit poly
0	1	0	5 bit then 4 bit poly
1	0	0	17 bit poly
1	0	1	no poly used
1	1	0	4 bit poly

Volume

The lower 4 bits of a Control Register hold a number that determines the sound volume. A value of '0' means no volume; whereas a value of 15 means maximum volume.

Volume Only Bit

When the television speaker receives electronic pulses it vibrates to make sound. Setting the 4th bit of the Control Register enables the Volume Only Mode which eliminates any repeating vibrations in the speaker. As a result, the only sound to be heard will be a short click.

Using the Frequency and Control Registers

Below is a table of possible Frequency Register values and the musical notes they will generate.

Table 3

Audio Frequency Musical Note

	Dec	Hex	
High Range	29	1D	C
	31	1F	B
	33	21	A# or Bb
	35	23	A
	37	25	G# or Ab
	40	28	G
	42	2A	F# or Gb
	45	2D	F
	47	2F	E
	50	32	D# or Eb
	53	35	D
	57	39	C# or Db
	60	3C	C
	64	40	B
	68	44	A# or Bb
	72	48	A
	76	4C	G# or Ab
81	51	G	
85	55	F# or Gb	
91	5B	F	
96	60	E	
Middle Range	102	66	D# or Eb
	108	6C	D
	114	72	C# or Db
	121	79	C
	128	80	B
	136	88	A# or Bb
	144	90	A
	153	99	G# or Ab
	162	A2	G
	173	AD	F# or Gb
182	B6	F	
193	C1	E	
204	CC	D# or Eb	
217	D9	D	
Low Range	230	E6	C# or Db
	243	F3	C

Now that the relevant sound controlling addresses have been explained, it is time for some practical applications. For example, suppose you want to generate a middle 'C' note (sound) at maximum volume without distortion, using channel 1. The first step in doing this is to examine the above table of music notes (table 3) to see what number corresponds with a middle 'C.' Examination of table 3 will reveal that this note is represented by a value of '121' (\$79 hex). In order to tell the computer to play a 'C' note, POKE

this value of 121 into the address of Frequency Register for channel 1 (53760 dec) (D200 hex).

POKE 53760,121

The second step is to generate maximum volume without any distortion by setting the 4 low bits of the Control Register of channel 1. In other words, to have maximum volume, a value of at least '15' must be POKEd into this Register. (see below)

Control Register AUDC1-4

Distortion							
+ Vol only			Volume				
7	—	4	3	2	1	0	= 15
	0	+	2 ³	2 ²	2 ¹	2 ⁰	

The third step is to eliminate any distortion setting from the Control Register. Because distortion results from using one of the randomizing polys, all polys should be disconnected. To accomplish this, examine the partial reprint of table 2 (below) in order to find the distortion setting which does not use a poly. (see below)

Distortion

Partial Bit Configuration (for poly(s))

Control Register AUDC1-4

	7	6	5	— not used for — distortion
--	---	---	---	--------------------------------

- 1) 0 0 0 5 bit then 17 bit poly
- 2) 0 0 1 5 bit poly
- 3) 1 0 1 no poly used <use this one

$$2^7 + 2^6 + 2^5 =$$

$$128 + 0 + 32 = 160$$

Because the 3rd distortion setting in the above table does not use a poly, it will cause the computer to produce a pure tone. To enable this option, bits 5 and

7 must be converted into their decimal equivalent. This is done by using the numbers of the set bits between 5 and 7 as powers of 2, and adding them together. The above diagram does this by adding 2⁷ to 2⁵ to yield a sum of 160, the decimal equivalent of the 'no poly option.'

The fourth and final step is to add the volume value (15) to the distortion value (160). The sum of this (175) represents the input for the Control Register for channel 1.

AUDC1 = Control Register 1 = 53761

POKE 53761,175

Below is a short program which performs the same sound operations described above.

```

10 REM set sound frequency
20 POKE 53760,121
30 REM
40 REM set distortion and volume
50 REM 53761,175
60 REM
70 REM GOTO 10

```

Audio Control Byte (AUDCTL)

In addition to the Frequency and Control bytes which independently control the 4 audio channels, there is option byte that affects all channels. Called the Audio Control byte (AUDCTL), this location allows the user to modify the existing sound system. Each bit in the AUDCTL has a specific assignment. (see below)

AUDCTL 53768 dec D208 hex

Bit: Explanation

- 7 Changes a 17 bit poly into a 9 bit poly
- 6 Clock channel 1 with 1.79 MHz
- 5 Clock channel 3 with 1.79 MHz
- 4 Join channels 1 and 2 (16 bit)
- 3 Join channels 3 and 4 (16 bit)
- 2 Inserts high-pass filter into channel 1, clocked by channel 3
- 1 Inserts high pass filter into channel 2, clocked by channel 4
- 0 Switch main clock base from 64 KHz to 15 KHz

Because the Audio Control contains a number of commands, I will, for clarity, go through them in reverse order, starting with the 7th bit and ending with the first.

BIT 7

Setting bit 7 causes the 17 bit poly counter to be changed to a 9 bit format. This shorter poly produces a distortion pattern that is more repetitious. The following program demonstrates the difference in sound between a 17 bit and 9 bit polys. Use the joystick to choose which poly to include in sound generation.

```

10 REM *****
15 REM *
20 REM * 17-9 BIT POLY CONVERSION *
25 REM *
30 REM *****
50 L=2
90 SOUND 0,0,0,0
100 GRAPHICS 0
102 POKE 752,1
104 POSITION 4,5
105 ? "17 Bit to 9 Bit Poly Conversion"
"
106 POSITION 6,14
107 ? "Use joystick(0) up/down "
108 POSITION 5,10
109 ? "Current status:"
110 REM *
120 REM * give channel 1 a frequency *
130 REM * setting *
140 POKE 53760,121
150 REM *
160 REM * give channel 1 volume *
*
170 REM * and a distortion setting *
175 REM * that uses the 17 bit poly *
180 POKE 53761,143
190 REM *
200 REM * Input joystick data *
210 ST=STICK(0)
220 IF ST=14 THEN L=2
230 IF ST=13 THEN L=1
240 REM *
250 REM * modify 17 bit poly?(AUDCTL)*
260 REM *
270 REM * 17 bit poly *
280 IF L=2 THEN POKE 53768,128
290 REM *
300 REM * 9 bit poly *
310 IF L=1 THEN POKE 53768,0
320 REM *
330 POSITION 23,10
340 IF L=2 THEN ? " 9 bit poly"
350 IF L=1 THEN ? "17 bit poly"
500 GOTO 210

```

Check Data

```

0 REM CHECK DATA FOR 17-9 POLY
CONVERSION
10 DATA 6287,728,465,316,466,722,475,4
1,5,920,146,104,198,720,195,9,635,150
130 DATA 8949,117,124,639,913,148,989,
133,643,623,73,393,392,639,922,641,687
,873
290 DATA 4066,644,634,759,638,240,154,
169,828

```

BIT 6 & 5

Setting bit 6 causes audio channel 1 to be assigned a clock rate of 1.79 MHz. (1.79 million pulses a second), whereas setting bit 5 causes audio channel 3

to be assigned that same rate. The following program reveals the change in sound produced from one frequency and control setting at different clock rates (15 KHz, 64 KHz and 1.79 MHz).

```

10 REM *****
15 REM *
20 REM * CLOCK RATE TEST *
25 REM *
30 REM *****
50 S=2
60 GRAPHICS 0
65 POKE 752,1
67 POSITION 14,5
68 ? "Clock Rate"
70 POSITION 6,14
72 ? "Use joystick(0) up/down"
75 SOUND 0,0,0,0
80 REM * Set channel 1 clock to 64 KHZ
*
82 REM * by using the AUDCTL *
90 POKE 53768,1
110 REM *
120 REM * Set frequency for channel 1
*
130 POKE 53760,125
140 REM *
150 REM * Set distortion and volume *
155 REM * for channel 1 *
160 REM * use Control Register 1 *
170 POKE 53761,175
180 REM *
190 REM * Unput joystick data *
200 ST=STICK(0)
210 IF ST=14 THEN S=5+1
220 IF ST=13 THEN S=5-1
230 IF S>3 THEN S=3
240 IF S<1 THEN S=1
250 POSITION 16,10
260 IF S=1 THEN ? "15 KHZ "
270 IF S=2 THEN ? "64 KHZ "
280 IF S=3 THEN ? "1.79 MHz"
290 REM *
300 REM * POKE clock commands into *
310 REM * the AUDCTL (channel 1) *
320 REM *
330 REM * 15 KHZ
340 IF S=1 THEN POKE 53768,1
350 REM *
360 REM * 64 KHZ
370 IF S=2 THEN POKE 53768,0
380 REM *
390 REM * 1.79 MHz
400 IF S=3 THEN POKE 53768,64
410 FOR X=1 TO 50:NEXT X
420 GOTO 200

```

Check Data

```

0 REM * CHECK DATA: CLOCK RATE TEST *
10 DATA 7919,426,241,805,242,428,482,9
62,880,155,380,150,609,44,63,428,989,6
35
120 DATA 6972,253,127,638,215,207,798,
137,642,643,72,524,526,269,264,243,704
,710
280 DATA 8964,751,644,957,528,638,74,7
70,641,81,773,644,187,826,622,828

```

BIT 4 & 3

Setting bit 4 causes channels 1 and 2 to join, producing a single 16 bit channel. Normally each channel has 256 (2^8) different frequency positions. However, when two channels are joined, the number of frequency positions increases to 65535 (2^{16}). Below is a short program which joins channels 1 and 2, so that fine adjustments in the sound frequency can be made.

```

10 REM *****
12 REM *
15 REM * 16 bit demo program *
17 REM *
20 REM *****
30 GRAPHICS 0
32 POSITION 10,4
34 ? "16 bit channel test"
35 POKE 752,1
40 C=100:C1=100
42 POSITION 4,8
44 ? "LOC. 53760 53762"
45 POSITION 8,12
46 ? " FINE COURSE ADJUSTMENTS"
47 POSITION 1,14: ? "Joystick 1
2 UP/down "
48 REM * Clock rate to 1.79 MHZ(64) +
*
49 REM * Join channels 1 & 2 (16) *
50 POKE 53768,80
55 REM *
57 REM * set volume of channel 1 to ze
ro *
60 POKE 53761,145
65 REM *
67 REM * give channel 2 pure tone at m
aximum volume *
70 POKE 53763,175
74 REM *
78 REM * input joystick information *
80 ST=STICK(0)
90 ST1=STICK(1)
100 IF ST=14 THEN C=C+1
110 IF ST=13 THEN C=C-1
120 IF ST1=14 THEN C1=C1+1
130 IF ST1=13 THEN C1=C1-1
131 IF C>255 THEN C=255
132 IF C<0 THEN C=0
134 IF C1>255 THEN C1=255
135 IF C1<0 THEN C1=0
136 REM *
137 REM * input for fine tuning *
140 POKE 53760,C
145 REM *
147 REM * input for coarse tuning *
150 POKE 53762,C1
152 POSITION 10,10
155 ? C;" ";C1;" "
160 GOTO 80

```

Check Data

```

0 REM CHECK DATA FOR 16 BIT DEMO PROG
10 DATA 8153,594,366,460,371,595,959,1
42,148,877,940,102,374,152,285,641,718
,429
50 DATA 6667,40,595,557,84,596,659,90,
596,400,30,81,490,492,639,641,447,230
134 DATA 4329,548,331,643,812,43,643,3
2,95,238,157,787

```

Line 60 sets bits 6 and 4 causing channel 1 and 2 to join, and the clock rate to be 1.79 MKz. Because channel 1 has no longer any output, Line 60 reduces the volume of this channel to zero. Line 70 enables channel 2 to generate a pure tone (no distortion) with maximum volume. The Frequency Register for channel 1 is used as a fine (low byte) frequency dial for channel 2, whereas the Frequency Register for channel 2 becomes the coarse (high byte) frequency dial. Use joystick (0) for fine sound adjustments, and joystick 1 for coarse. Setting bit 3 of the AUDCTL joins channels 3 and 4 in much the same way as described above.

BIT 2 & 1

Bit 2 and 1 control the high pass filters. A high pass filter allows only sound frequencies that are higher

than a specified amount to be released. When bit 2 is set, channel 1 is passed through a high pass filter that is clocked by channel 3. This means that channel 1 will be able to generate only frequencies that are higher than the current frequency of channel 3. For example, if channel 3 is generating a sound frequency of 40 KHz, channel 1 would be able to create only sounds that are higher than this amount. Bit 1 of the AUDCTL works in much the same way as does bit 2, the only exceptions being that channel 2 uses the high pass filter, and channel 4, clocks it. The following program demonstrates the effects of a high pass filter. In it, channel 1 uses a high pass filter, whereas channel 3 specifies what frequencies are to be filtered out. Notice how the program first enables a filter (line 150), then provides volume for channel 1 (line 200), and finally eliminates any sound output from channel 3. After RUNNING the utility, use the joystick to set both Frequency Registers 1 and 3 with '255.' Then slowly decrease the number in Register 3. Notice how the decrease of the values stored in register 3 causes only the higher frequencies of channel 1 to be generated. (filtering!)

```

10 REM *****
20 REM *
30 REM * High Pass Filter Test *
40 REM *
50 REM *****
70 F1=150:F3=125
88 GRAPHICS 0
89 POKE 752,1
90 POSITION 16,6
92 ? "Filtered / Clocked"
93 POSITION 1,8
94 ? "Frequency Register: 1 3"
95 POSITION 12,3
96 ? "High Filter Test"
97 POSITION 4,12
98 ? "Use Joystick(0)"
100 SOUND 0,0,0,0
110 REM *
120 REM * Enable high pass filter *
130 REM * into channel 1 clock by *
140 REM * channel 3 *
150 POKE 53768,4
160 REM *
170 REM * Give channel 1 pure tone & *
180 REM * maximum volume /store to *
190 REM * Control Register 1(AUDC1)*
200 POKE 53761,175
210 REM *
220 REM * Set the volume of *
230 REM * channel 3 to zero *
240 REM * Control Register 3(AUDC3)*
250 POKE 53765,0
260 REM *
270 ST=STICK(0)
280 IF ST=14 THEN F1=F1+1
290 IF ST=13 THEN F1=F1-1
300 IF ST=11 THEN F3=F3+1
310 IF ST=7 THEN F3=F3-1
312 IF F1>255 THEN F1=255
314 IF F1<0 THEN F1=0
316 IF F3>255 THEN F3=255
318 IF F3<0 THEN F3=0
320 REM *
330 REM * POKE frequency for channel 1
*
340 REM * Frequency Register 1 (AUDF1)
*
350 POKE 53760,F1
360 REM *
370 REM * POKE frequency for channel 3
*
380 REM * Frequency Register 3 (AUDF3)

```

DISK LABEL MAKER

by Bob Cockroft

If you are one who often wastes time searching through your disk collection for a program, Disk Label is an utility that may be helpful. This program will print a compact list of what files your disk contains. Because this list of contents is printed in hard-copy form, it can be attached to a disk so that its files can be easily identified. Before RUNNING this utility, make certain the printer and interface are on-line. Soon after the Disk Labeler begins, the computer will ask for the number of the drive you want to use. Type in this number, and place in this drive the disk for which you want a list of contents. The computer will then ask for a name to indentify the disk. After typing a name and pressing the RETURN key, the drive will turn on, and the printer will begin to write the list of the disk's contents.

```

100 REM *****
110 REM * *
120 REM * DISK LABEL MAKER *
140 REM * *
150 REM *****
160 GRAPHICS 0
170 TRAP 440
180 CLOSE #1:CLOSE #2
190 DIM ST$(10),BSE$(40),NAMS(40),CS(40)
200 CS(40)=" "
210 ? :? "Which disk drive";
220 INPUT DD
?TR ? " NAME DISK "
    
```


```

240 INPUT NAMS
250 ST$="D"
260 ST$(LEN(ST$)+1)=STR$(DD)
270 ST$(LEN(ST$)+1)=":*. *"
280 OPEN #1,6,0,ST$
290 OPEN #2,8,0,"P":? " PRI
NTING "?:
300 PRINT #2;" DISK: ";
NAMS
310 PRINT #2:?" #2;" FILE SEC
FILE SEC":? #2
320 INPUT #1,BSE$:IF BSE$(5,8)="FREE"
THEN 380
330 ? #2;" ";BSE$;
340 INPUT #1,BSE$
350 IF BSE$(5,8)="FREE" THEN 380
360 ? #2;" ";BSE$
370 GOTO 320
380 ? #2:?" #2;" ";BSE$(1,3);" F
RE SECTORS AVAILABLE"
390 PRINT #2:PRINT #2
400 CLOSE #2
410 ? :? " PRESS START TO RERUN"
420 IF PEEK(53279)=6 THEN RUN
430 GOTO 420
440 ? "MAKE CERTAIN THE PRINTER IS ON-
LINE"
    
```

Check Data

```

0 REM * CHECK DATA: DISK LABEL MAKER *
100 DATA 7221,600,381,84,34,384,605,11
,834,379,260,778,237,903,183,25,738,78
5
270 DATA 8233,540,200,584,191,234,812,
80,152,943,24,835,313,429,826,326,911,
833
440 DATA 893,893
    
```




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YELLOW BRICK ROAD

by Peter Ellison

This is part three of the series called, "ROM's Glossary for the Atari." Since I will not likely have all the definitions, I would very much appreciate hearing from whoever could add to my list.

ROM's GLOSSARY FOR THE ATARI

Label: A name attached to an instruction or statement in a program that identifies the location in memory of the machine language code or the assignment produced from that instruction or statement.

Least Significant Bit: The rightmost bit in a group of bits, that is, bit 0 of a byte or a 16-bit word.

Line: In BASIC, a line consists of one or more BASIC statements preceded either by a line number in the range of 0 to 32767, or by an immediate mode line with no line number.

Low Level Language: A computer language that the computer can execute directly with no translation other than numeric conversions.

LSI: Acronym for Large Scale Integration. This refers to a technology for manufacturing silicon chips. LSI chips are the largest and most powerful chips in mass production: they contain many thousands of components.

Luminance: Atari's term for brightness, it is the lower nybble of a color register's color. In the BASIC 'Setcolor' command, the third operand is the luminance. There are eight even-numbered values for luminance (\$0 to \$F, even values only) which, in combination with hue values, produce the 128 colors available on the Atari computers.

Machine Language: The programming language that the computer can execute directly with no translation other than numeric conversions.

Map Mode: This is a specific type of ANTIC display mode using simple colored screen pixels instead of characters for the screen display. There are eight ANTIC map modes with varying degrees of resolution. Six of these are callable from BASIC.

Mark: The 1 state on a serial data communications line. For cassette I/O, this is a 5327-Hz frequency.

Marker Character: For cassette I/O, this is 55 (hex) value, whose purpose is to adjust the baud rate. Including the start and stop bits, each marker character is 10 bits long.

Memtop: In BASIC, a pointer ([90,9] decimal) to the top of application RAM, the end of the user program. Program expansion can occur from this point to the end of free RAM, which is defined by the start of the display list. This Memtop is not the same as the

OS variable called Memtop.

Memory Map: A memory map is a description of where things are in memory. Having one of these handy is essential when one is doing any type of programming.

Missile: In Player/Missile Graphics, each player has an associated missile. This means there is a maximum of four missiles. A missile is a one-dimensional image in RAM used in player-missile graphics and is 2 bits wide.

Mode Line: A collection of horizontal scan lines for screen displays. Depending upon the BASIC or ANTIC display mode in effect, a mode line will be composed of varying numbers of scan lines. By the same token, depending upon the display mode, a screen image will be composed of varying numbers of mode lines.

Modem: A device that adds or removes a carrier frequency, thereby allowing data that is to be transmitted on a high-frequency channel to be received from such a channel.

Module: A part or section of a program.

Monitor: A program in ROM that handles both the system power-up and SYSTEM RESET sequences. This program allows the computer user to enter programs and data, to run programs, to examine contents of the computer's memory and registers, and to utilize the computer's peripherals.

Most Significant Bit: The leftmost bit in a group of bits, that is, bit 7 of a byte or bit 15 or 16 of a bit word.

Murphy's Law: the famous maxim that "whatever can go wrong, will."

Narrow Playfield: A screen display width option equal to a width of 128 color clocks.

Nesting: Constructing programs in a hierarchical manner with one level contained within another, and so forth. The nesting level is the number of transfers of control required to reach a particular part of a program without ever returning to a higher level.

Nibble (or nybble): A unit of four bits. A byte (eight bits) may be described as consisting of a high nibble (four most significant bits) and a low nibble (four least significant bits).

NMI: Non-Maskable Interrupt (i.e., cannot be disabled by the 6502). The Display List Interrupt and the Vertical Blank Interrupt are both NMIs. These can be disabled with the ANTIC NMIEN register.

NMIEN: The Non-Maskable Interrupt Enable Register which controls enabling of various NMI interrupts such as the Display List Interrupt (DLI).

Normal IRG Mode: In cassette I/O, this is a mode where the tape always comes to a stop after each record is read. If the computer stops the tape and gets its processing done fast enough, the next read may occur so quickly that the cassette deck may see a slight dip in the control line.

Normal Playfield: A screen display width option equal to a width of 160 color clocks.

Object Code: The code produced by a compiler or Assembler program. It can be directly understood by the Atari computer without using a language such as BASIC as a translator.

Object Program: A program that runs directly on the Atari computer. An object program, created by an Assembler or a language such as ACTION! uses the actual numeric instruction code of the Atari's 6502 microcomputer chip.

Open (a file): Make a file ready for use. The user generally must open a file before working with it.

Operator: In BASIC, any one of the 46 tokens that in some way move or modify the values that follow them.

Operator Stack: In BASIC, a software stack where operators are placed when an arithmetic BASIC expression is being evaluated.

Operating System (OS): A computer program that controls the overall operations of a computer and performs such functions as assigning places in memory to programs and data, scheduling the execution of programs, processing interrupts, and controlling the overall input/output system. It is also known as a monitor, executive, or master-control program, although the term monitor is usually reserved for a simple operating system with limited functions.

Overflow: The result of the arithmetic operation is too large for the register specified. The sign bit is filled from the next lower bit, and a status flag is set.

Overscan: The 'spreading out' of a television image by the raster scan method of display so that the edges of the picture are off the edge of the television tube. This guarantees no unsightly borders in the television picture.

Page: A subdivision of the memory. In 6502 terminology, a page is a 256-byte section of memory in which all addresses have the same eight most significant bits of a memory address.

Page Flipping: A method of changing screen memory pointers in order to change the current screen display. The common methods of displaying data on the screen involve PRINTing or POKEing data. With page flipping, screen images are stored in various pages of RAM, and then pointers are changed that tell the computer to get its screen data from the desired RAM locations, rather than redrawing onto the screen.

Paddle: A piece of equipment used for games and

drawing on the screen. The uses to which it can be put include axis position for accuracy.

Parallel Interface: An interface between a CPU and input or output devices that handle data in parallel (more than one bit at a time).

Parameter: An item that must be provided to a subroutine or program in order for it to be executed.

Pascal: A structured computer language descended from ALGOL 60. Added features include "records" (data structure definition) and "sets." It is suitable for a wide variety of chores from systems to application programming. A stripped-down version of Pascal for the Atari, 'Draper Pascal,' by Draper software, is a good place to start if you wish to learn Pascal.

Peripheral: Any external device connected to a computer and controlled by it.

PIA: Acronym for Peripheral Interface Adaptor. This is an LSI chip which interfaces the 6502 with external devices. The joystick pins of the two or four user ports are connected to a PIA inside the computer.

Pirate: This term is given to a person who illegally trades, buys or sells copyrighted merchandise. In the computer industry, this usually involves stealing software through copying cassettes or disks.

Pixel: The smallest screen graphics unit addressable in a particular display mode. It is a square whose size depends on the display mode.

Player: A one-dimensional RAM image used in player-missile graphics which can be 128 bytes (double-line resolution) or 256 bytes (single-line resolution) long. The player appears as a vertical band 8 pixels wide stretching from the top of the screen to the bottom. There is a maximum of four or five independent players, depending upon whether you combine the missiles or not.

Player Color: The color of a player in player-missile graphics. Each of the four independent players has its own color stored in its associated color register.

Pointer: A data item whose contents are the address of another data item.

Port: The basic addressable unit of the computer's input/output section.

Programming Language: A set of rules specifying a language that can be translated into Machine Language and cause the computer to carry out functions. These include ACTION!, Atari Microsoft Basic, Atari Basic, Basic A MAC 65, Macro-Assembler, Pilot, Synassembler, and Valforth.



The New 16-Bit Machines

by Paul Knapp

On January 5, 1985, at the Winter Consumer Electronics Show in Las Vegas, Nevada, the New Atari Corporation made two startling announcements: first, that Atari was earnestly examining the possibility of relocating in Nevada some major facilities; and second, the introduction of a new line of 16/32 bit computers.

The first announcement is of interest as it indicates both a possible decline in the tendency to manufacture outside North America, and also the development of home manufacturing to serve the home market. Although the second announcement is the focus of this article, both are indicative of the type of bold and thorough business campaign one has come to associate with Mr. Jack Tramiel. The motto of the New Atari Corporation is 'Power without the Price'. The new line of 16/32 bit home computers is clearly in keeping with this creed.

It is difficult for me to present a brief overview of the new home computers without sounding biased (I am unabashedly and thoroughly impressed with what I have seen to date); therefore, I will make a special effort to be clear about what is known, what is suggested by the manufacturer, and what is pure speculation.

As of the writing of this article, I have had but the barest exposure to the new xxxST Computers. The computers on display at the CES were running programs burnt into ROM cartridges or stored on RAM drives along with the necessary data. My examination of the machines was limited to viewing the computers running graphics demos, the GEM desktop environment, and a couple of games which showed the use of the mouse. Given these remarks, let me now explain the 130ST and 530ST computers to the degree possible, saving in-depth descriptions until we have had the opportunity to take one apart from both the hardware and the software perspectives.

The Machines—Target Users

The New Atari Corporation has targetted these new machines at the 'Home Computer Market'. I must admit that, despite my nine years experience in all areas of computing, I don't know what a home computer is; however, whether you use these machines in the home or office you are getting what may prove to be the most revolutionary computer offering of the last five years, and probably of the next several as well!

The 130ST and 520ST machines are identical

except for the respective amounts of main memory—128K and 512K RAM—and therefore, I will refer to them as the 'ST' machines. These computers are the most powerful, fully featured (ie. screen, keyboard, CPU, peripheral communications, and disk drive are considered standard) personal computers available, and are also intended to be priced well below those of the non-existent competition. Some have speculated on a base price of \$1000.00 US for the 520ST with monochrome monitor and single disk drive—impressive if possible, stupendous if the \$1000.00 barrier is beaten.

130ST/530ST-Hardware

The ST machines are packaged in three attractive silver-grey plastic components: the Keyboard-CPU; the Monitor with optional integral 3 1/2" floppy and optional 3 1/2" hard disk; and the separate 3 1/2" floppy disk drive. The keyboard housing contains the sculptured IBM Selectric layout of keys, a 'T' shaped cursor control pad with some special function keys, an 18 key numeric keypad, and the Central Processor main memory and peripheral connections.

The system memory consists of 192K ROM, expandable to 320K with plug-in cartridges containing the operating system and system support routines including graphics support routines, 32K RAM for bit-mapped graphics, and 128K or 512K main RAM for programs and data.

The graphics system supports a 512 color palette and three graphic modes: 320x200 pixels in 16 colors, 640x200 in 4 colors, and 640x400 in monochrome. From the graphics demos I viewed, I found the display to be very fast and flicker-free.

The central processor is a Motorola 68000 running at 8 megahertz. This processor features a 16 bit data bus with instruction pre-fetch, 8 32-bit data general purpose registers, 8 32-bit address registers, a 24 bit address bus, 7 levels of interrupt (the interrupt structure used in the STs is currently unknown), and 56 instructions supporting 14 addressing modes on 5 data types. This is a very powerful and mature processor which has received ample acclaim from hackers all the way to NASA.

These machines contain Direct Memory Access (DMA) which is presumably support for high-speed—(1.33 Megabytes/Second)—access to the 10 Megabyte 3 1/2 inch hard disk, or the 250k/500k 3 1/2 inch floppy disc, depending on storage density chosen. The maximum disk configuration appears to be 1

hard drive and 2 floppy drives, ample for home, school, or office.

The STs also contain standard RS-232 serial and Centronics parallel interfaces, high-speed hard disk interface, floppy disk interface, joystick and mouse ports, a sophisticated 3 channel sound generation chip with separate volume and frequency controls, MIDI interface potential, and a real-time clock.

130ST/530ST-Software

There is little software currently available for these machines. The computers themselves will not be shipping until the beginning of the second quarter. They have been developed with an Operating System rather than with the usual home or games machine design of having all system routines accessed through ROM address calls. The operating system — TOS, and the desktop operating environment — GEM have been produced in conjunction with Digital Research — developers of the 'CP/M' family of operating systems, languages, and support products. The advantage of having an operating system is that software may be more easily 'ported' or transferred from other operating systems to TOS than would have been possible had simple ROM address calls been used. This will increase both the speed with which popular software products will move onto the Atari hardware, and the number of products which will become available.

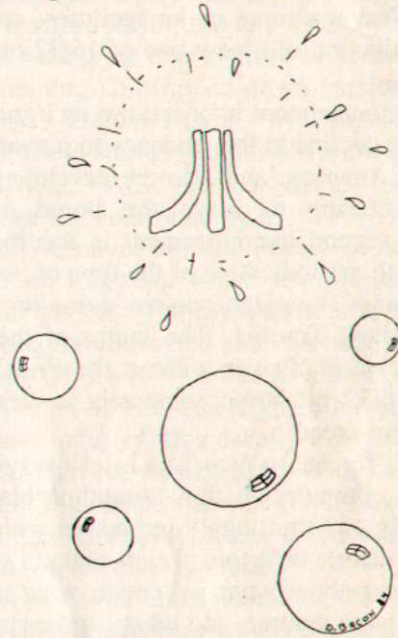
Currently, the only programming languages available are interpreted BASIC and Logo; however, I expect other language and support products to be available when, or shortly after the STs become available.

Operating System-Environment

The operating environment follows the format developed at XEROX Palo Alto Research Centre and recently exemplified in the Apple Corporation's Macintosh computer. The screen is highly graphic, using Icons or symbols to denote disk, files, and the like. One uses the cursor keys or the two-button mouse to move the arrow-like cursor to point at objects on the screen/desk. Although the GEM environment and TOS operating system are single-tasking in design, (ie. you may do only one thing at a time), you may choose to put several pieces of paper on your desk and slide one out from under another using the mouse.

We will provide a more detailed examination of this powerful and very user-friendly environment in a later issue, once we have had sufficient time to explore it ourselves. Until then, suffice it to say that the New Atari Corp. has put forth the most powerful, and yet, inexpensive personal computer on the market today.

In future articles we will assist you in exploring the 130ST and 520ST in terms of how it fits into the home, school, and office; we will review the software and support products for this line as they become available and provide across manufacturer comparisons so that you may see how well these machines out-perform the Apple II and Macintosh, the IBM PC and PC Junior, the Commodore 128, and other personal computers.



Atari's Sound System (cont'd)

```
390 POKE 53764,F3
400 REM *
410 POSITION 21,10
420 ? F1;" ";F3;" "
500 GOTO 270
```

Check Data

```
0 REM CHECK DATA FOR HIGH PASS FILTER
TEST
10 DATA 7464,594,365,611,367,598,12,97
2,886,154,76,105,624,152,939,155,773,8
1
110 DATA 7413,635,922,834,4,37,640,0,1
05,819,131,636,561,519,819,31,641,79
200 DATA 6919,603,605,597,557,552,336,
560,344,638,259,92,98,642,265,26,108,6
37
410 DATA 1184,237,113,834
```

BIT 0

Setting bit 0 causes the timing system to use the 64 KHz clock instead of the 15 KHz clock. Because of this higher clock rate, all sounds will be generated at a higher frequency (pitch). For a demonstration of this effect, examine the program that was used in conjunction with the BITs 6 & 5, the CLOCK RATE TEST.

Why Buy An Atari?

by Peter Ellison

This is the sixth issue in which I have written this section, and now, more than ever, the Atari, for its price, is the best home computer on the market. In Canada it is selling for \$180, and it is much lower in the United States. This price will encourage many of you to buy one.

Every once in a while we receive excellent letters from readers telling us why they bought their Atari. Below is a letter from James Patchell, President of the Santa Barbara Atari Computer Enthusiasts, or SBACE, for short.

To the Editor:

Well, I just found an issue of your magazine in the club mail, and I have to admit that I am impressed, and I don't generally like 'hobby' magazines (I don't subscribe to any). I did enjoy reading ROM, but I must take small exception to the section entitled, 'Why Buy An Atari.' It did not say anything that wasn't true, the Atari is, for the price, superior to anything on the market. However, I have never seen it said anywhere why it is superior.

I have owned and worked with many different computers from my first, a Polymorphic 88, to big CP/M machines (physically that is). All of them have their advantages, including some over the Atari, but none of them have had such well thought out operating systems. And the one part of the operating system that makes it so great is the Central I/O routine. Most users are sort of oblivious to the CIO, mostly because it does work so well. It allows any who understand computers a hardware independent interface between the microprocessor and ALL I/O devices, from the keyboard to the floppy disks. Also, the way the CIO works makes it very easy to add in additional I/O devices. The only job left to the programmer is to write a simple I/O driver that gets installed in an AUTORUN.SYS file.

Another thing that makes the Atari great is the SIO routine. Even though the serial port on the Atari is a big bottle neck and sometimes a real pain, it is a standard communications port with a standard protocol that will transport data at a very respectable rate. It allows you to connect a great variety of devices to the bus. The ATR8000 is, I think, an excellent example. Because of the versatility of the BUS you can connect a whole other computer up to the Atari to increase its capabilities further. I do have to admit that understanding the SIO fully is not an easy task (it took myself several months), but once you do, you can

appreciate the Atari further.

It is sometimes hard to argue these points when you and your friends are having a "discussion" on which computer is best," and I have found it sad that many decisions are based on "software availability" rather than on technical excellence and flexibility. The following is a good example:

A Commodore fan, whom I was showing my Atari to, commented on the fact that I have to have DOS resident in memory. I only had to reply that I can choose a DOS to fit my needs and showed him my collection of various DOS's.

So, I guess I can say in conclusion that, with the Atari, we have a better computer because it has a superior operating system, and it is a very flexible system in which you are not tied to any one line of thought.

Also I think it is the best computer because you can purchase ACTION! for the Atari, and for no others.

Sincerely

James Patchell

I was really encouraged after reading this uplifting letter because it made me feel proud to be one of the many who have purchased an Atari computer.

In the last issue we sent out a Questionnaire to Atari User Groups in order to obtain reader input, the results of which appeared in this issue. For the benefit of those who did not receive the original, it is now again presented. We would be pleased to hear from anyone who might care to respond.

ROM MAGAZINE QUESTIONNAIRE

- 1)What User Group are you from?
- 2)Where did you buy your Atari?
- 3)Why did you buy an Atari?
- 4)Whom have you had contact with regarding the Atari, and how responsive were they to your questions?
- 5)Since the take-over at Atari, have you been able to make any contact with anyone? If YES, with whom; if NO, what do you think the reason is?
- 6)What types of things do you do at a typical user group meeting? Do you enjoy them?
- 7)What suggestions, if any, do you have for people who want to start up a new user group?
- 8)Which magazines do you read regularly concerning computers?

9) Why do you read magazines?

10) What things would you like to see in a magazine that are not in them?

11) What is your favorite game, Educational Program, Business Program, Utility program, that is available for the Atari computer?

12) What program would you like to see for the Atari but is not yet available?

13) Where do you buy most of your software?

14) What is your favorite type of software?

Below, are a number of answers from User Groups to our Questionnaire.

User Groups that sent in their questionnaires were MILATARI, Milwaukee, Wisconsin; Atari Boosters League East (ABLE), Winter Park, Florida; Austin Atari Computer Enthusiasts, Austin, Tx; and the Rogue Area Atari Computer Enthusiasts (R.A.A.C.E.).

Printing each of their answers would take up quite a lot of space, so I'm just going to pick a few answers from each questionnaire.

Regarding the second question, most of the Users bought their Atari's in a computer store that specialized in Atari's. This indicates that small computer stores are often more helpful when one is buying his first home computer system. Since the drop of Atari's price more people will be buying computers from mass merchandisers like Sears or JC Penny. Since they are probably not in a position to provide assistance to such individuals, there will be a great opportunity for user groups to fill this gap.

In the third question, I asked, "Why did you buy an Atari?" Below is ABLE's explanation of why Atari is the best:

It is the Best, most innovative 8 bit machine. Below is my answer in point form:

It has the following:

- Excellent keyboard.
- Powerful Editor.
- Simultaneous video and RF output built-in.
- Versatile, fast, high resolution graphics with 256 colors and P/M graphics.
- Four sound synthesizing channels.
- Standardized I/O bus port for peripheral devices.
- An operating system that provides interface between programs and hardware in a device independent manner.

—The Atari design insulated the CPU from house-keeping functions by surrounding it with some special purpose, programmable support processor chips to handle graphics, sound, I/O and screen functions.

—With Atari, software can reside in RAM, ROM, Cartridge ROM, cassette or diskette. All of the media are removable, expandable, changeable, and portable.

—Atari used to offer excellent customer support and to run an Atari Program Exchange (APX) for users.

Other comments included the following: "Bought one on the recommendation from friends," "a helpful dealer," "able to talk and work with customers", "able to work with the computer through the phone when at work," and "because of the price."

Other comments included: "Bought one on recommendation from friends," "a helpful dealer," "willing to talk and work with customers"; "to work with the computer at work through the phone"; and, "because of the price."

In the fourth question, I asked with whom they had made contact at Atari. Answers received included: "I talked with the dealer and public relations representatives at the factory, also with the help line, all of whom were very helpful." "I spoke with Earl Rice and Mark Cator, and they were both very responsive." "I spoke with the repair group, and they were very helpful with all of my questions."

In the fifth question, I asked if they had spoken with anyone at Atari since the take over. There were a variety of answers, but one of the more significant ones was: "I haven't made contact, and am afraid they will forget the user groups." I can verify, from a good source, that they're not going to forget the user groups and will be a lot more helpful than were the former owners of Atari.

In the sixth question, I asked what types of activities took place in a regular User Group meeting.

All User Groups were similar in their meetings in that they reviewed programs, showed demos, discussed group buys, news, and rumors, had special speakers, and asked one-another questions. Some asked us how they could make their User Group better. My suggestion would be for each member in the group to study a different programming technique and to present a short tutorial on it. In this way a person can learn programming much faster with less difficulty. Should a user have trouble speaking in front of a group, he or she could present the tutorial in written form from which photo copies could be made and handed out to all group members. One could also write a newsletter. This, as a group effort, would be a uniting factor and would help create a feeling of accomplishment within the group.

These are just a few suggestions regarding what could be done to enhance a User Groups activities. I would like to hear from many more User Groups, telling me what type of things they do that are different.

In the seventh question, I asked what suggestions an established User Group had for Atari Owners who wish to start up a new User Group.

Answers included the following: "Getting a copy of the booklet called 'How to start AUG,' from Atari," "getting a store to help you initially," "talking to a president of one of the established groups," "getting a library of public domain software together," and finally, to new groups, "at first, keep it simple and fun."

In the eighth question, I asked what magazines the group read on a regular basis.

There are a number of excellent magazines on the market, and they all have their good and bad points. I try to read most of them because, no matter what computer they're for, you can usually find something useful in them. These include Antic, Analog, Byte, Compute, Creative Computing, Infoworld, and ROM. Although Antic, Analog, and ROM are the only three specializing exclusively in Atari, the others have their place as a good source of general knowledge.

In the ninth question I wanted to know the main reason that you read the magazines. This was for information, education, and to see what was new in the form of ads.

In the tenth question I asked what types of things you would like to see in magazines but haven't been seen yet. One that sounded interesting and hasn't been considered by ROM was 'Performance and comparison testing between hardware and software items.' Other answers were the following: "More emphasis on business applications," "more educational programs in which college students might use," and "more honest reviews." We, at ROM, hope to discuss most of these things in future issues, and if you have any more suggestions, we'd be glad to hear them.

The eleventh question asked what types of programs our readers like. Among the favorite game programs were Archon, Lode Runner, and UltimaIII. The educational programs were the Plato Cartridge and Agent USA. Business Programs were Synfile +, Visicalc, and B/Graph. The favorite utility program was Omnimon.

Programs that readers wanted but weren't available for the Atari included University Programs (formulas), Davka translations, an electronic program for circuit design and functional testing, 80 column word processor & terminal program. None of these are available at this time except the 80 column word processor. A special 80 column version of Letter Perfect is now available for the Atari that has the 80 column

Omnimon board.

In the thirteenth question I asked where you usually buy your software. The predominant answer was that it was through a mail order company. I think most readers go into software stores, try out a program, and then send away for it. Mail Order companies can sell for much less because they have less overhead. Though it is advantageous to the buyer, it hurts the small software store.

The final question was, "What type of software do you enjoy the most?" To this, there was no clear cut answer. I believe Atari Users have a very large choice of software available. If not, they can always do their own programming because the Atari is a very flexible machine.

In closing, I want to thank all of the people who answered the questionnaires, and I hope that more will do so, so we at ROM can get a better perspective of what is wanted.

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Beginner's Line BUG HUNT

by Sol Guber

The art of programming is the art of logical thinking. To write a program that is meaningful involves a great deal of foresight and an eye to details. It is a skill that can be learned, yet there is an art to good programs. As in all art forms, different ideas can be expressed in different medias. So, too, in programming. Each language has its own flaws and enhancements. It is very similar to doing a painting in charcoal, in oils, or in pastels. As an example, I will write a program in BASIC, FORTH, LOGO, and ACTION!. This will show the flaws and enhancements in each of these languages. I will try to limit myself to using the same variable names and to try to make each version of the game as similar as possible to the others.

First, let me explain the game called BUG HUNT. It is a one player version of the old favorite, BLOCK-ADE. There is a moving snake on the screen that is controlled by a Joystick. As the snake moves, it tries to eat randomly placed bugs on the screen. It cannot hit its own body, nor can it hit the border. After all the bugs are eaten, the number of bugs is increased, and the speed of the snake is increased. The Joystick controls only the direction of the snake, the worm will move by itself.

Now that we have the idea of the game, let us think of the various parts that need to go together to make it playable. Let us just let the ideas flow in the order that they will appear on the screen. Let us also number the ideas so that we can refer to them later.

- 1)TITLE-this will show the name of the game
- 2)BORDOR-around the screen
- 3)MAKEBUGS-put random bugs on the screen to be eaten
- 4)INITIALIZE-make variables to the correct values
- 5)STARTWORM-get worm to move

Now that the worm is moving, we need to do some checking of what the worm is doing. These are the categories:

- 6)EAT—BUG-eat a bug
- 7)EAT—BODY-go over the same path
- 8)EAT—WALL-hit the boundary.
- 9)CHANGE—DIR-change the direction of the worm under Joystick control

Now that we have the fundamentals we can put in the sounds and other aspects later. We have broken the whole idea down into nine steps, and each of these

steps can be further broken down to make the coding that is needed to tell the computer how to play the game.

The major problem of programming is writing the coding that the machine will translate into something that it will understand. There must be a compromise between what the machine wants and what the human wants, but the human wants to write the program in a simple logical manner. Edsger Dijkstra came up with the concept of "structured programming." This says that programs should be made up of simple logical steps. There should be no looping and as simple a structure as possible. For our program there could be six parts called TITLE, START, STARTWORM, UPDATE, CHECKWORM, and RESTART. The program would flow from top to bottom with the only looping being to restart the game. This kind of programming is really possible today. There are languages that allow and enforce this "linear flow" programming.

The languages that will be used to program BUGHUNT will be BASIC, FORTH, ACTION!, and LOGO. These four languages do not have much in common. To use FORTH, LOGO, and ACTION! a basic difference is needed. These two languages use a procedural method of programming. This means that words are defined to do things. In ATARI BASIC this would correspond to the use of GOSUB TITLE to get the system to make the title. The next statement might be GOSUB MAKEBUG, etc., until the whole program was defined in a linear sort of way. This would eliminate GOTO statements, and everything would be done in terms of GOSUB's. This is the way that both FORTH and LOGO work. We set up a word TITLE, and every time TITLE is in the program, a title page is put on the screen. Other words are also defined like MAKEBUG, or CHANGE—DIR. Whenever these words are seen in the program, that action is performed.

The strength of words rather than of GOSUB's is the use of parameter passing. Let us suppose that we have a BASIC subroutine called MAKEBUG defined so that it will put bugs on the screen. Let us suppose that there is a variable called NO that is the number of bugs that MAKEBUG will put on the screen. This is easy to do and would work. However, suppose that we forget that NO is the variable for the number of bugs. To use the subroutine correctly, every variable

in it must be used correctly. There can be no variable that changes in the subroutine that is used elsewhere in the program. LOGO uses a parameter list so that you do not have to remember the name of the variable, and the word can be used all through the program without having to remember the details of the word. This is very handy when different people write different parts of a program. Let me explain this further. BASIC is a very bad language for writing large programs since it cannot be easily subdivided. Each variable in the program is global. This means that the same variable will have the same value wherever it is found in the program. You cannot define a X1 that means one thing in one part and something else in another, unless it is just used for temporary storage. If two or more people want to write parts of the program together, each has to know how the other uses each of the variables, so that there is no conflict. A person cannot write a subroutine to add three numbers together and get the average unless each of the holders (variable names) is the same for everybody who uses it. This is not true for procedural languages. In LOGO you can use the word AVERAGE :X1 :X2 :X3, and when AVERAGE is used, it will put the value in :X1 in its local variable, the value :X2 in its local variable, and so forth. All a person needs to know to use AVERAGE is that it needs three numbers after the name when it is used.

FORTH uses a similar procedure for its words. FORTH uses a "push-down" STACK for its values. You put a number on the stack and push it down. Then you put another number on and push that one down, and, finally, push the third number down the stack. When AVERAGE is called, it takes the three top numbers in the stack and finds their average and pushes that number onto the top of the stack. Thus, for a FORTH programmer to use AVERAGE, all she needs to know is that three numbers need to be pushed onto the stack, and the average will be found on the top of the stack.

ACTION! allows both global variables and local variables, as well as variables that are defined only when they are passed as parameters. There is good checking for the use of variables, and an error is shown when a variable is not defined before use. Also ACTION! allows you to INCLUDE other parts of programs and allocates space for global variables from this, too. This is a much more sensible method of using variables. Then, if you want to use AVERAGE, you just INCLUDE it and know that it needs three variables as parameters.

BUGHUNT IN BASIC

The BASIC version of the game is relatively

straight-forward as most BASIC programs are. There are a great deal of GOTO's and GOSUB's, so the flow of the program is not easy to follow. It is a great deal more convoluted than either of the other two versions and is more difficult to write. However, the simplicity of the program commands compared to the FORTH version shows why BASIC is the first language to be learned. But when it is compared to the LOGO version which is in a closer version of ENGLISH, it shows why children should learn LOGO first.

I will again follow the outline of the program that I used in the beginning and go through each step of the program in order. The first item is the TITLE. Lines 1001-1002 setup the title. First, the Graphics 0 mode is used, then the color is set, and "BUG HUNT" is positioned in the middle of the page. Line 1002 puts two FOR-NEXT loops into the system to shift the colors and to make a varying sound. Since the background is Color Register 2, this is the one that the various colors are put into.

Line 1003 sets the variable SPEED to 25. This will be put into a FOR-NEXT timing loop later in the program. Line 1004 puts the system into the graphics 7 mode, the same as the draw mode in LOGO. It also sets the variable NO, the number of bugs, to 4. Line 1010 puts the X and Y position of the line to position 25,25 on the screen. Line 1012 corresponds to BORDER. It first sets the COLOR to register 3. It then PLOTS a point, and then DRAWTO's to various points around the screen to make the border.

Line 1014 is the first use of a subroutine. It is used to draw the bugs on the screen. The variable NO is used to tell the subroutine how many bugs to draw. The value in NO is not passed in a positive manner. The subroutine just 'assumes' that the value there is the correct one. Let us jump to line 2000 to see this subroutine. Line 2000 starts a FOR-NEXT loop for NO times. Line 2002 picks two random numbers in the correct range for the bug. Line 2004 does a LOCATE on the spot that was selected, and line 2006 examines the variable Z which was the value in LOCATION R1, R2. If the value is background (0) the program continues, otherwise the program goes back to line 2002 and picks new values for R1 and R2. Line 2008 sets up COLOR 2 and plots a point at R1 and R2. Since the dots in Graphics 7 are so small, the bug is made up of four dots around the dot that was picked. This is done in lines 2010-2020. Line 2030 checks the variable I to see if it is greater than NO. If it is not, the program goes back to line 2000, otherwise the program RETURNS to the place where it was called.

Back at line 1014, a message is put on the bottom of the screen to show what level you are playing. Line 1016 sets up COLOR 1. Two variables, DX and DY,

are initialized. These two variables show the change in the movement of the worm. If DX is 1, the worm moves to the left. If DX is -1, it moves to the right. If DY is 1, the worm moves down. If DY is -1, it moves up. Since no diagonal moves are allowed, either DX or DY must be 0 when the other has a value.

Line 1020 checks Joystick 0 and puts its value in variable B. If B is 15, corresponding to a neutral position, B is set to S1. Line 1021 makes a sound for the game to make the play more thrilling. Lines 1025-1040 check the value of the Joystick. Depending on the value, either DX or DY is changed to show which way the Joystick is pointing. Line 1042 adds the value of DX and DY to the values of X and Y respectively. Line 1044 changes the sound to give a beating effect.

Lines 1045-1050 are part of the timing loop and are used to make the Joystick more sensitive to changes in direction. The timing loop is just a simple FOR-NEXT loop. It uses the variable I again just as the loop in 2000 did. If I is used in many spots, as it is here, you must be sure that the old value is not needed. All the I's in the program use the same memory location and each is a GLOBAL variable. It means the same thing all through the program. The Joystick is checked three times to make sure that it has not moved. If it is checked only once at the beginning of the timing loop, it might miss slight changes in the movement. This is needed because the BASIC program is relatively slow.

Line 1060 does a locate on the screen of the next dot. Lines 1065-1075 are a series of IF tests to determine the next action. If the value is 1, the program goes to line 1500 which corresponds to EAT—BODY. If the value is 3, the program goes to 1400 which corresponds to EAT—WALL. If the value is 2, the program goes to 1600 which corresponds to EAT—BUG. If the value is 0, that point is PLOTed on the screen to increase the length of the worm. Then the program goes back to line 1020 which started the loop.

Lines 1500-1530 correspond to EAT—BODY. Line 1500 puts a message on the screen and then starts a loop to make a noise. Line 1510 puts another message about the trigger on the screen. Line 1530 checks to see if the trigger is pressed. If it is, H1 is set to 0, SUM is set to 0, and the program goes back to 1003 to start again. If the trigger has not been pressed there is an endless loop set up between 1530 and 1520 until the trigger is pressed.

Lines 1400-1410 correspond to EAT—WALL. It is the same as 1500-1520 except that the first message is different. After that, the program is identical, so a simple GOTO 1520 uses the same lines of code.

Lines 1600-1630 correspond to EAT—BUG. Line 1600 increases both H1 and SUM by one. The position of the worm is incremented by the directions, and

this point is PLOTed. This is done since the bug is two pixels by two pixels, and we want to count each bug only once. Line 1610 is an IF test to see if H1 is equal to NO—the number of bugs in this level. If it is not, an update is written on the bottom of the screen, and the program returns to 1020. If they are equal, line 1620 makes H1 equal to 0, increases the number of bugs by 2, and increases the level by one. The timer in the loop SPEED is decreased by 10%, and a message is printed on the screen. There is a slight delay, then the program returns to line 1004.

Lines 1650-1680 is just an update of the score and of the level. Messages are printed at the bottom of the screen that say which level you are on and how well you have done. It also plays the BURP noise to show that the worm has eaten the bug.

This is the BASIC version of BUGHUNT. As can be seen, it is fairly complicated if you are trying to debug (excuse the expression) the program. A major advantage of the BASIC program is that you can put STOP's into the program at various points to stop the action. You can then examine the variables and see what is going on. Let us say that we put a 1015 STOP into the program. When the program reaches this line it will stop. However, it is difficult to determine exactly where the program is coming from when it hits this point. It could be the first time through and just setting up the system. It could be after the trigger has been pressed in either EAT—WALL or EAT—BODY. It could be after a restart when a level has been finished. It is very difficult, and for anyone except the original programmer, almost impossible to determine.

```

1001 GRAPHICS 0:SETCOLOR 4,5,5:POSITIO
N 10,10:? "BUG HUNT"
1002 REM FOR D=1 TO 6:FOR E1=1 TO 89:5
OUND 1,E1,10,10:SETCOLOR 2,E1/6,D*2:NE
XT E1:NEXT D:SOUND 1,0,0,0
1003 SPEED=25:LVL=1:NO=4
1004 GRAPHICS 7
1010 X=13:Y=23
1012 COLOR 3:PLOT 10,3:DRAWTO 150,3:DR
AWTO 150,70:DRAWTO 10,70:DRAWTO 10,3
1013 GOSUB 2000
1014 GOSUB 1650
1016 COLOR 1
1018 DX=1:DY=0
1020 B=STICK(0):IF B=15 THEN B=51
1021 SOUND 3,200,10,15
1025 IF B=14 THEN DY=-1:DX=0
1030 IF B=13 THEN DY=1:DX=0
1035 IF B=7 THEN DX=1:DY=0
1040 IF B=11 THEN DX=-1:DY=0
1042 X=X+DX:Y=Y+DY
1044 SOUND 3,150,10,15
1045 FOR I=1 TO SPEED/3:NEXT I
1046 S1=STICK(0)
1047 FOR I=1 TO SPEED/3:NEXT I
1048 S2=STICK(0)
1049 FOR I=1 TO SPEED/3:NEXT I
1050 IF S1=15 THEN S1=52
1060 LOCATE X,Y,Z
1065 IF Z=1 THEN 1500
1070 IF Z=3 THEN 1400
1075 IF Z=2 THEN 1600
1080 PLOT X,Y
1120 GOTO 1020
1400 ? "YOU ATE THE WALL ":FOR I=1 TO
120:SOUND 3,50,12,12
1405 SOUND 3,40,12,10:NEXT I:SOUND 3,0

```

```

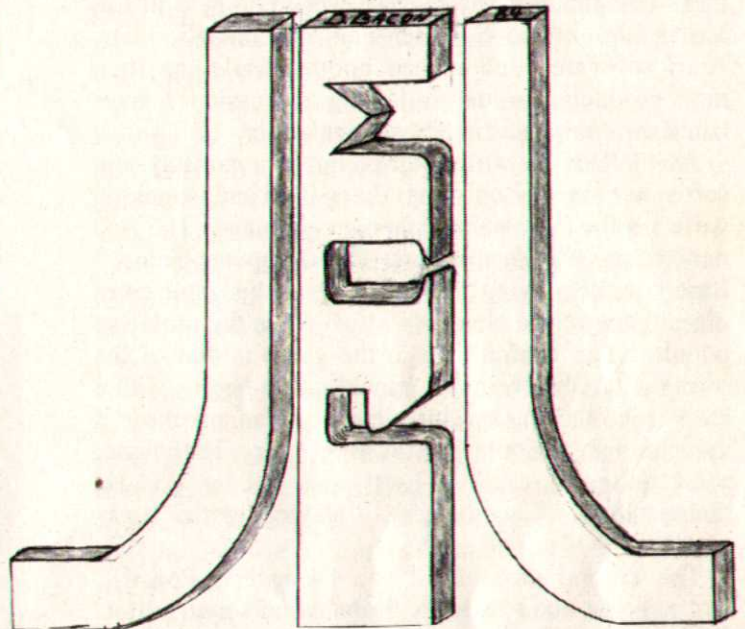
,0,0
1410 GOTO 1510
1500 ? "YOU ATE YOUR BODY":FOR I=1 TO
120: SOUND 3,50,12,12
1505 SOUND 3,40,12,10:NEXT I: SOUND 3,0
,0,0
1510 ? "PRESS fire TO BEGIN!"
1520 IF STRIG(0)=0 THEN H1=0:SUM=0:GOT
0 1003
1530 GOTO 1520
1600 H1=H1+1:SUM=SUM+1
1605 X=X+DX:Y=Y+DY:PLOT X,Y
1610 IF H1<>NO THEN GOSUB 1650:GOTO 10
20
1620 H1=0:NO=NO+2:LVL=LVL+2
1621 SPEED=INT(SPEED*0.9):? "NEXT GROU
P"
1622 FOR I=1 TO 250:NEXT I
1625 GRAPHICS 7
1630 GOTO 1004
1650 ? "KLEVEL ";LVL
1655 ? "THIS ROUND = ";H1;" TOTAL
= ";SUM
1660 SOUND 3,0,0,0: SOUND 2,90,10,15
1665 FOR I=1 TO 100:NEXT I
1670 SOUND 2,0,0,0
1680 RETURN
2000 FOR I=1 TO NO
2002 R1=INT(RND(0)*63+3):R2=INT(RND(0)
*130+10)
2004 LOCATE R2,R1,Z
2006 IF Z<>0 THEN 2002
2008 COLOR 2:PLOT R2,R1
2010 PLOT R2,R1+1
2015 PLOT R2+1,R1+1
2020 PLOT R2+1,R1
2030 NEXT I
2040 RETURN


```

```

10 REM CHECK DATA FOR BUG HUNT
1001 DATA 9942,760,267,650,64,939,648,
994,5,851,979,108,336,792,742,702,786,
319
1044 DATA 6839,345,11,94,13,97,15,548,
213,331,328,334,960,923,518,585,929,59
5
1505 DATA 9560,586,17,801,933,482,954,
547,832,666,696,73,931,384,704,113,697
,144
1680 DATA 5312,906,211,743,298,385,570
,132,229,133,808,897

```






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ROM GOES TO THE W.C.E.S.

by Peter Ellison

The 1985 International Winter Consumer Electronic Show was held in Las Vegas from Saturday, January 5, through Tuesday, January 8, with a record breaking attendance of more than 101,000 trade visitors. This fair was the biggest ever to be held in Las Vegas. As in the Summer Fair in Chicago, many Atari software vendors had booths displaying their new products. In the following discussion I have listed the companies in alphabetical order.

ACTIVISION, which started out as a game system software company only, has diversified and is making software for most popular home computers. The first new game is "Ghostbusters: The Computer Game." Based on the movie, "Ghostbusters," this game combines many of the elements which made the movie so popular. The central role in the game is that of the owner of a Ghostbuster's franchise. He begins with a loan from the bank with which he can purchase a vehicle and various ghostbusting gear. The game, being quite enjoyable in itself, also has the popular theme song, "Ghostbusters," playing in the background.

The second program, "The Designer's Pencil," isn't a game but a fantastic graphic and sound editor. With a Pencil, the user selects from a menu of over 80 simple English "commands" and builds "programs" which create illustrations, colors, and sounds. The commands, designed by Garry Kitchen, reduce complex computer instructions to simple, straightforward statements. ("Circle" draws a circle, for example). All commands are available at the touch of a joystick or keyboard.

The last program that is available for the Atari is "Space Shuttle: A Journey Into Space." The program is a detailed simulation of a shuttle mission. This game challenges the user to develop the skills necessary to be a shuttle pilot.

ARTWORX, which is famous for the graphics in "Strip Poker," has released two new fast action games for the Atari Computer. They are "Ghost Chaser," and "Slap Shot Hockey."

"Ghost Chaser" is an action oriented game with some interesting problem solving twists. Globbing the phantoms that materialize throughout old Fairport Manor with ectoplasm is only part of the game. Special keys, needed to open secret passageways and the ultimate ghost chamber, are hidden in the different rooms.

The second game, "Slap Shot Hockey," is a realistic sports simulation that brings you and an opponent right onto the ice. Besides being a true two player game, Slap Shot is one of the few games with digitized speech. Great play action and realistic

maneuvering (even body checking) make Slap Shot a one of a kind sports simulation.

AVALON HILL, a company that was at one time only a boardgame company, released a new wargame for the Atari: "Gulf Strike." This examines almost every aspect of this complex region where the potential for superpower confrontation is eminent. This is a brigade-level simulation which pits Iran and the USA against Iraq and the USSR. It is complete with a fine-scrolling map and a unique way of handling unit's stacks.

BATTERIES INCLUDED, a relatively young Canadian software company, has introduced two new software packages for the Atari computer: they are "Homepack," and "PaperClip."

"Homepack" is actually three programs in one: "HomeTerm," "HomeFind," and "HomeText." "HomeTerm" is a comprehensive telecommunications program which turns your Atari into a 'smart' terminal. Users can communicate with other computers, access public databanks, and participate in public Bulletin Board Systems. "HomeFind," a data manage program, features "Dynamic Space Allocation" which constantly moves and rewrites information to make room for storage space. Data search speed is enhanced by HomeFind's overlapping index system and flexible query format. Simplified output commands permit the fast and easy printing of files. "HomeText" incorporates advanced word-processing features such as full-screen editor, cut and paste, and graphic preview mode. "HomeText" also supports most major printer functions, including bold face, underlining, and extended character width.

The second program, "Paper Clip," is a best-selling word processor program translated for the Atari. Paper Clip allows the user to configure almost every program function to his or her personal needs from text editor to file handling, and to printer interface. Once set, a customized version of the program can be saved to any disk. Multiple versions can be saved for different applications.



COVOX, INC. is a new company which has introduced "Voice Master," a revolutionary hardware and software system for the personal computer. "Voice Master" is actually three exciting products in one: "Speech Synthesizer," "Word Recognition," and "Voice Harp." Perhaps the most exciting of all is the "Voice Harp" application: Multi-part harmony with octave changes can result when the operator simply hums (or whistles) into the microphone. The resulting music score scrolls by on the video display, complete with note duration and pauses. In an editing mode the notes can be corrected or changed, with the final score then going to a printer. One need not know music in order to be able to compose and write; only the ability to hum or whistle is required. I did not believe something like this would be possible for such a low price. This could make a music composer out of anyone.



EPYX, a leader in producing high-quality entertainment software, has done it again with the release of nine new games for the Atari. Their booth was a little different from most because it had children from the ages of eight to fifteen demonstrating each game.

Two games that were demonstrated in Chicago at Atari's booth are now under Epyx's name. They are "Ballblazer" and "Rescue on Fractalus" from Lucasfilm Games. "Ballblazer" is a futuristic, two-player fantasy sport, played at very high speeds on a split screen showing both player's point-of-view. "Rescue on Fractalus!" is a space action-strategy game featuring realistic 3-D simulation.

In addition to Lucasfilm games, Epyx introduced four other Action-Strategy games. These are "Summer Games II," "Two-on-Two Sports," "FBI," and "The Right Stuff."

Eight more ways for you to go for Olympic gold are provided by "Summer Games II." The new Epyx game builds on the excitement of its predecessor, Summer Games, which is still on the top 10 "hit lists" of most industry charts. The new events in Summer Games II are fencing, cycling, equestrian competition, and kayaking, as well as many others.

"Two-on-Two Sports" offers computer gaming enthusiasts a chance to play as a team against the computer in four of the most popular sports. These are volleyball, soccer, football, and baseball. Players can be on the same team against two computer controlled opponents; or the computer can supply a solo player with a teammate or with two computer controlled opponents; or two players can play against each other, each having a computer controlled teammate. Each game includes the key action segment from the particular sport involved.

"FBI" takes a fun approach to simulations by challenging the player to pass "The Bureau's" qualification tests. With realistic graphics and sound, you're able to test your skill on the combat pistol range, try your endurance on the rough obstacle course, challenge your memory by reconstructing "mug" shots, or put on your thinking cap and take a written examination that will test your general knowledge of criminology.

"The Right Stuff" puts you in the cockpit of a World War II Spitfire in the Battle of Britain. With joystick in hand, you take off and land, and intercept the enemy, thus engaging in thrilling aerial "dog fights." The extremely realistic graphics and action let you simulate air combat conditions over the channel in 1940.

New releases in the strategy game category are "Empire" and "Rogue."

In "Empire," your strategy to achieve global domination is the key element of this computer wargame. The computer is the tireless enemy which you try to outwit by building ships, planes, and armies. Each city conquered produces new forces for you to command. You must plan carefully because your opponent is also building an empire, and only one of you will survive.



In "Rogue" your mission is to make your way through a maze of seemingly never-ending dungeons and to return with the "Amulet of Yendor." Beware! your path is strewn with trap doors, deadly darts, and menacing monsters. "Rogue" is one of the best

known fantasy role playing games on mainframes. Now you can play it on your own home system.

EPSON AMERICA, INC, which is famous for its inexpensive dot matrix printers, has brought out a new printer called "HomeWriter 10." This new dot matrix printer offers easy plug-in compatibility with most popular home computers, including the Atari. The sleek new 80-column printer connects with them via Epson's new plug-in Printer Interface Cartridges (PICs). Each PIC is a combined ROM cartridge and cable that connects the printer to a specific computer. The PICs plug in as easily as does an electrical cord into an ordinary wall socket. A major benefit of HomeWriter 10 is that it operates in both draft and near letter quality modes and with Epson's exclusive SelecType feature, offers all the most popular types-styles. The printer operates at over 1000 words per minute (100 cps) in draft mode, and at over 160 words per minute (16 cps) in near letter quality. With no special programming, SelecType enables printer users to choose combinations of print styles such as condensed, emphasized, doublestrike, or near letter quality, simply by pushing buttons on the printer's control panel.

KRAFT SYSTEMS, a new joystick company, has released a brand new joystick for the Atari. This black joystick is sleek, fast, and extremely accurate. It is guaranteed for over a million cycles, thus having a very long life.

HYBRID ARTS is developing MIDI hardware and software to meet the needs of the professional musician. This multitrack sequencer and keyboard extender works with the Atari computer and any MIDI equipped keyboard. This will cut the cost for many musicians who would like the power of a 16 track sequencer but can't afford the price.

MICROLAB, which is famous for its game software, like "Miner 2049," has just released three business related products for the Atari. The first, "Tax Manager," with its three part program that guides you step-by-step through your federal tax forms, allows you a quick and easy way to do this.

"Personal Banker" allows you to keep track of your own personal finances. With it, you will be able to know where your money is going, where it has gone, and where your tax deductions are.

The third program, "HomeWriter," is a word processing program that has an electronic card file and other features usually found on more expensive programs.

Two educational games have just been released with fun and education value combined.

The first, "Barnaby Builder," is an arcade-type game that develops planning skills, logic, hand-eye coordination, and shape perception. You select blocks of various shapes and sizes from five chutes, load

them on a springboard in any of five positions, and flip them up. If you plan correctly, you'll build a balanced tower. If you stack them incorrectly, they'll come crashing down.

The second game, "Barnaby Math," is one that's designed to stimulate math, logic, planning, and perceptual skills. You construct a valid math statement that equals your "goal" number for each level. This game should keep both the young and old entertained and informed.

"Caribbean Quest" is a new realtime hi-res graphics adventure. It was written by the authors of the famous game, "Death in the Caribbean," so one might expect it to provide many hours of enjoyment.

MICROPROSE, a company which has supported the Atari computer from the very beginning with games like "Mig-Alley Ace," "F-15 Strike Eagle," "Solo Flight," and "Nato Commander," has released three new ones. The first, "Kennedy Approach," puts you in command of the air traffic system at some of the United States busiest airports. More than twenty different aircraft could be calling you at the same time. You will hear their radio calls and your broadcast messages in high quality speech right from your computer! Your job is to guide all the aircraft, from a DC-3 to the supersonic Concorde, to a safe landing.

"Crusade in Europe," the first in a series, simulates the American and British struggle against Nazi Germany from the D-Day invasion to the Battle of the Bulge. It includes three short battle scenarios that can be played in an hour, and two longer scenarios that take two to four hours.

"Decisions in the Desert," the second in the series, recreates the tense battle between Field Marshall Erwin Rommel's Afrika Korps and the British 8th Army for control of North Africa.

MINDSCAPE has released two new educational programs starring "Tonk" and "Tink," their favorite little characters used in all their children's educational programs.

"Castle Clobber" helps 4 to 8 year olds build logic, inference, critical thinking, concentration, memory, and visual discrimination skills while challenging children to help Tonk rescue all the toys in Tink!Tonk! land from the evil clutches of Gork.

"Subtraction Fair" invites children to a mythical, mathematical "fair" where there are colorful games, prizes, adventures, and arcades. Children can pilot Tink into five different game booths: Magic Show, Dunk Gork, Witches Brew, Bear Dare, and Ring the Bell, where there are subtraction "contests" to play.

In "Bank Street Music Writer," beginners, amateurs, and professionals can use simple word-processor style keystrokes to arrange and edit music in four voices. You can use different colored notes to track

voices separately, and you can store up to 70 music staves or 8000 notes. You can save compositions, and print "piano quality" copies.

"The Halley Project: A Mission in Our Solar System" is an actual realtime simulation in our solar system. Tests and obstacles in it help players master basic facts about the solar system including details on Halley's Comet and its orbit giving them an understanding of gravity, atmospheric conditions, orbital motion, relative size, position and orbits of planets and moons, location of constellations, and how eclipses work.

PEACHTREE SOFTWARE is producing educational software for people from the age of eight to adulthood in a market that still isn't saturated like that of the preschool age group. They have done it with programs like "compu-read." This program was designed to improve reading speed and recall. Four learning units provide reading practice in letters, words, synonyms and antonyms, and sentences. Compu-read presents a continuous challenge because the speed at which the lessons are presented automatically readjusts to a student's highest reading rate.

"PSAT and SAT Word Attack Skills" are tutorials which strengthen word comprehension and word analysis skills and familiarize college-bound high school students with testing formats. They focus on the antonyms portion of the Scholastic Aptitude Test, and choose the 400 vocabulary words contained in each system on the basis of their frequent appearance on recent examinations.

In "Rendezvous," you are the flight commander of an Enterprise-class space shuttle: your mission is to deliver life sustaining supplies to an orbit space station. In this true-to-life simulation of space navigation, you must guide your craft from lift-off to docking while battling the forces of gravity and thrust.

PARKER BROTHERS, who brought arcade games like "Starwars" and "Gyruss" to the home computer, have introduced a sequel to the classic arcade game, "Qbert." This is "Qbert's Qubes," which features Qbert, the snout-nosed arcade athlete who must, instead of just changing the qubes, make sure that each qube lines up in the correct sequence. If Qbert can rotate all the Qubes in one row to match the target qube, he completes the round.

PERSONAL PERIPHERALS, who introduced "Super Sketch" at the Summer Show in Chicago for \$49.95, has dropped the price to \$29.95 (Drawing software Included). This is one of the best deals that I've seen for a long time.

QUANTUM MICROSYSTEMS has introduced a modem specifically for the Atari called, "Q-Modem" that doesn't even need an interface or power adapter. Features include tone dialing, auto-answer, and auto-exec for unattended use, three ways to transfer files,

and a built-in Editor. It, being only 5x4x1.5 inches in size, is very portable.

SUNCOM has just released "PQ-The Party Quiz Game." What distinguishes it from other computer games is its hand-held Quick Response Controllers which free players from the keyboard. These controllers are connected to the computer with six-foot-long cables. The computer screen asks a question and provides, numerically, four multiple-choice answers. Players simply press the corresponding number on their controllers. The game comes with "General Edition I" software, which covers such categories as history, politics, entertainment, sports, and science. Additional software disks are available including "Education Edition I," "General Edition II," "General Edition III," "Entertainment Edition I," "Sport Edition I," and "Bible Edition I."



SSI released three new strategy games for the Atari.

"Imperium Galactum" allows you to design your own legion, or starships ranging from explorers to battleships that can ravage an entire planet. They are rated for different weapon systems, defense and evasive capabilities, armor, speed, and size. Your ships must be maintained lest they deteriorate. Each warship in your fleet can be individually monitored and repaired. Whereas Rome conquered a world, you can conquer a universe.



Cont'd on Page 62

ATARI'S TIMING SYSTEM PT. II — USED WITH SOUND

by Bob Cockroft

It is assumed that the reader of this article either has a basic understanding of the Atari's timing system, or has read Part 1 of this series. (see ROM issue 8 p.25). In addition, the reader will need to know the fundamentals of the computer's sound system. (refer to 'Atari Sound' in ROM issue 10) It is the goal of this article to explain how to use the system timers in conjunction with the sound system. Sound (music) routines do not need to completely occupy the computer's attention. By using the timing system, sound routines can be added to the regularly occurring chores of the Operating System. As a result, music sequences can be made an inherent part of the machine. In fact, it is possible to have the sound system play a favourite tune while the computer is being used for some unrelated purpose.

System Timers

It was mentioned in Part 1 of this series that the Atari computer has 5 system timers. Because these timers have interrupt capabilities, the regular workings of the operating system can be temporarily stopped in order that a user subroutine can perform some function. To the computer, the system timers are much like an alarm clock. They can be set so that the computer is forced to perform some operation at a predetermined time. Below is the list of the system timers, their addresses, and interrupt vectors (or flags).

Table 1: System Timers

Symbol (Timer)	Location (dec.)	Symbol Interrupt Vector	Location Interrupt Vector
CDTMV1	536,537	CDTMA1	550,551
CDTMV2	538,539	CDTMA2	552,553
		Interrupt Flag	Interrupt Flag
CDTMV3	540,541	CDTMA3	554
CDTMV4	542,543	CDTMA4	556
CDTMV5	544,545	CDTMA5	558

As displayed on table 1, system timers use a 2 byte memory configuration in lo/hi byte form. This means that numbers larger than 255 can be used as settings

for the timers. For example, suppose you want to set timer #2 with a value of 5500 decimal. The first step is to convert this decimal number into its hexadecimal equivalent. (see below)

step 1

Starting decimal number: 5500

Decimal	conversion	Hexadecimal
5500/4096	= 1.34277	1
.3427*16	= 5.48433	5
.4843*16	= 7.75000	7
.7500*16	= 12.000	C

Hexadecimal equivalent: 157C

step 2

Because bytes that have 8 bits can hold only numbers between '0' and '255,' the second step is to convert the hexadecimal equivalent number (157C) into 2 digit halves so that it can be stored as 2 bytes. (see below)

	hi byte	lo byte
157C becomes	15	7C

step 3

The third step is to convert the 2 digit hexadecimal numbers into lo/hi byte form. This is accomplished by multiplying the first digit by 16 and adding the product to the second digit.

$$7C = 7*16 + 12 = 124 \text{ lo byte}$$

$$15 = 1*16 + 5 = 21 \text{ hi byte}$$

The final step is to store the 2 decimal numbers into timer #2—lo byte first and hi byte second.

Once activated, these timers decrement from a user defined starting value that can range anywhere from 1 to 65536. For example, if a value of '100' were

POKEd into one of these timers, it would be reduced by '1' every VBLANK(1/60th of a sec). What occurs when this value reaches zero depends on whether the timer uses an interrupt vector or an interrupt flag.

Interrupt Vector

If the Timer uses an interrupt vector (like Timers #1 & #2), control is directed to the address specified by its vector. For example, if timer #2 counts-down to '0,' and its interrupt vector has a lo byte of '0' and a hi byte of '6,' control will be passed to address \$600 (1536 dec.)

Description/location	Number held
Interrupt Vector 2 (lo byte) 552 dec.	0
Interrupt Vector 2 (hi byte) 553 dec.	6

Interrupt flag

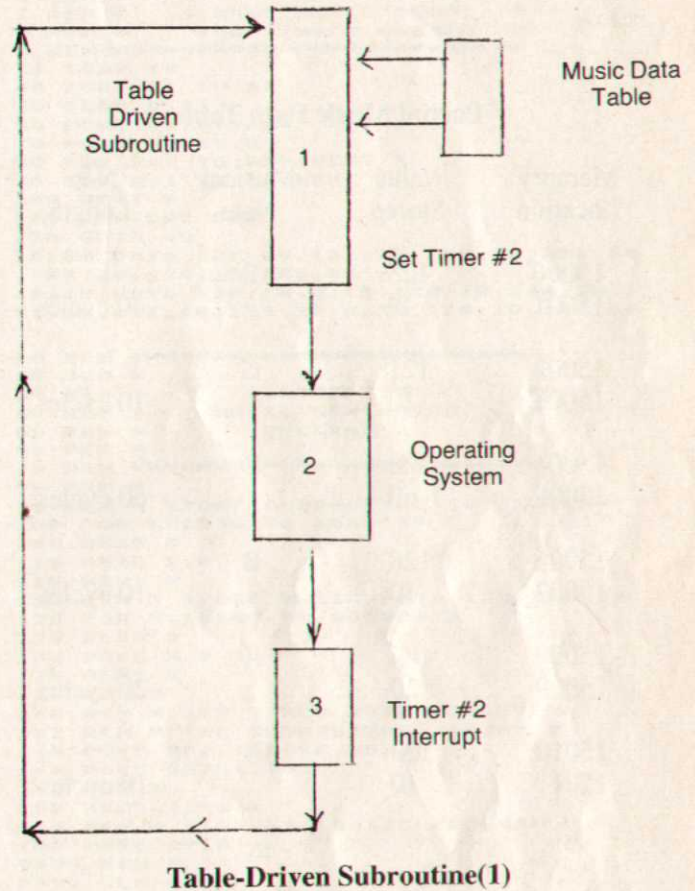
An interrupt flag is used by Timers #3, #4, and #5 as an alternative system. Using only 1 byte, the flag provides some of the same services as does the vector. When a timer counts-down to zero and an interrupt occurs, its corresponding interrupt flag will be set. For example, when Timer 3 reaches zero, its interrupt flag (CDTMA3: 554 dec) will be set equal to '1.'

The Program

The program at the end of this article, called the 'Automatic Music Generator,' uses the timing system to add the playing of a musical tune to the regularly occurring chores of the operating system. Because of this, the tune will play even if the computer is being used for some other purpose. In other words, any software the computer may be RUNNING would not affect the timing of the musical notes. Many professional programmers used this technique to simplify sound routines. In fact, if it were possible to stop the execution of some game programs, the musical background would still be playing, as long as the Operating System were functional. Although the 'Automatic Music Generator' uses some fairly advanced techniques, it is easily understood as consisting of the 3 steps: (1) Table-Driven Subroutine, (2) the Opera-

ting System, and (3) Timer #2 Interrupt. It will be helpful to refer to this table while each of its steps is being explained.

Combining with the Operating System



The first step is to make a table-driven subroutine that plays musical notes. A table-driven subroutine is a small machine language program that uses tables of memory data as input in much the same way as a BASIC program uses DATA statements. This subroutine will perform 4 functions: (1) to load 2 bytes of data from the Music Data Table, (2) to generate a musical note, (3) to increment the data counter, and (4) to reset the Timer.

The first function of the subroutine will be to load 2 pieces of data from the Music Data Table. But before the manner in which the routine performs this operation can be explained, how the Music Data Table operates must be understood.

The Music Data Table is like sheet music to the computer in the sense that it tells the machine what notes to play. As a result, it is possible to have the computer play different sound routines by simply rewriting this table. The Music Data Table contains 2 categories of information: (1) the musical notes, and

(2) their lengths. The pitch of every note and its length in the sound routine are stored as a pair of numbers. The first number represents the pitch of the note; the second, its length. When more notes are added, the Musical Data Table becomes a list of alternating note, and note length values. This pattern can be seen in the partial listing of the music data table below.

Partial Music Data Table

Memory Location	Value Stored	Musical Note	Note Length
15000	128	B	
15001	40		40 cycles
15002	121	C	
15003	10		10 cycles
15004	108	D	
15005	60		60 cycles
15006	128	B	
15007	10		10 cycles
15008	144	A	
15009	20		20 cycles
15010	128	B	
15011	10		10 cycles
''	''	etc.	'' ''

The 'Automatic Music Generator' uses DATA statements on lines 10100 and 10110 to store the Music Data Table. The Table is entered into memory locations 15000 to 15033, using the READ and POKE commands on lines 120 to 135.

Music Data Table

addr.	value	Subroutine Input
15000	128 Note: B	1st
15001	40 length	Pair
15002	121 Note: C	2st
15003	10 length	Pair
15005	108 Note: D	3st
15006	60 length	Pair
''	'' ''	etc

The first operation of the subroutine is to load the starting pair of numbers from the Music Data Table. As a value that represents a musical note, the first number in this pair is taken from the table and stored to Sound Frequency Register 1. As a result, the tone identified by this first number will be generated. Because the second number in this pair represents the note's length, it is used to set one of the system timers. In this program, Timer #2 is used for this purpose. It was explained in the first article of this series that any of the System Timers should be set by using the SETVBV routine. By storing the timer number in the Accumulator ('A'), the low byte of the timer value in the 'Y' Register, and the corresponding high byte in the 'X' Register, jumping to the SETVBV routine will set the timer automatically. Therefore, by storing a '2' in the accumulator, an '0' in the 'X' Register, and the note's length number in the 'Y' Register, Timer #2 will be activated with a time setting equal to that of the length of the note when the SETVBV routine is activated.

SETVBV Routine Application

```
LDA #2           ;Set Timer 2
LDY #(note's length) ;low byte
                  ;(2th number in
                  ;in the pair
LDX #0           ;high byte
```

In order to read the next pair of music data numbers, the subroutine increments the table pointers by 2. In addition, an RTS (return from subroutine) instruction would need to be placed at the end of the routine so that control would be given back to the Operating system. Although the code from this subroutine could be stored anywhere in RAM, the program uses a group of bytes beginning at 1536 (\$600 hex). Below is a Table-driven subroutine that contains all the specifications described above.

```
00020
00030
00040           Table-Driven SUBROUTINE
00050
00060
00110 .OR $600
00120 PLA           ;PULL BYTE OF STACK
00130 LDX $3A97     ;ENTER DATA
                  COUNTER
00140 L2 LDA $3A98,X ;ENTER TONE DATA
00150 STA $D200     ;NEW SOUND
00160 INC $3A97     ;INCREMENT DATA
```

```

00165 INC $3A97      ;COUNTER
                        ;INCREMENT DATA
                        COUNTER
00170 LDA $3A99,X   ;ENTER TIME DATA
00180 CMP #0        ;CHECK FOR DATA
                        END
00190 BNE L1
00200 LDX #0        ;RESET DATA
                        COUNTER
00210 STX $3A97
00220 JMP L2        ;RE-ENTER DATA
00230 *
00240 *            SET UP TIMER #2
(SETVBV)
00250 *
00260 L1 TAY        ;SET TIME (LOW BYTE)
00270 LDX #0        ;SET TIME (HIGH
                        BYTE)
00280 LDA #2        ;TIMER #2
00290 JSR $E45C    ;TO SETVBV
00300 RTS

```

The Operating System(2)

After the subroutine has instructed Sound Channel 1 to play a note from the Music Data Table, control is given to the Operating System. From this point, the Operating System will perform its usual chores and allow the a programmer to use the machine for whatever purposes he wishes. Because the computer is controlled by the Operating System for the greatest amount of time, there will be no noticeable difference in the machine's operation.

Timer #2 Interrupt(3)

As you remember, back in the subroutine, Timer #2 was set to the length of the current musical note. Since that time, the Operating System has been controlling the computer in the usual manner. When Timer #2 counts-down to zero, it's indicated to the computer that it is now time to play the next note in the Music Data Table. As a result of the Interrupt which naturally occurs when Timer #2 counts-down to zero, control is passed from the Operating System back to the Table-Driven Subroutine so that the next note can be played. This is accomplished by pointing the Interrupt Vectors of Timer #2 to the starting address of the Subroutine (1536/\$601 hex). The 'Automatic Music Generator' sets the Vectors on line 145. (see below)

Starting addr of Subroutine = \$601 hex

Timer #2 Vector: 552,553

145 POKE 552,1:POKE 553,6

By returning control back to the Subroutine, a cycle has been completed. Because one of these cycles is made for every note from the Music Data Table, control is continuously being passed back and forth between the Operating System and the Subroutine.

```

5 REM *****
6 REM *
7 REM *   SIMPLE MUSIC DEMO   *
8 REM *   (no timers used)   *
9 REM *****
10 TRAP 40
40 FOR Y=1 TO 17
45 READ D,A
50 POKE 53761,164
70 POKE 53760,D
80 FOR X=1 TO A*5:NEXT X
90 FOR W=1 TO 50:NEXT W
100 NEXT Y
120 RESTORE 500
130 GOTO 40
10100 DATA 128,40,121,10,108,60,128,10
,144,20,128,10,162,45
10110 DATA 128,10,0,10,128,10,144,20,1
62,10,193,40,128,10,0,10,128,10,144,40

```

```

10 REM *****
20 REM *
30 REM *   AUTOMATIC   *
40 REM *   MUSIC GENERATOR   *
50 REM *   PROGRAM 1   *
60 REM *
70 REM *****
80 REM *
95 REM * STORE SUBROUTINE (at 1536)*
100 FOR X=1536 TO 1536+39
105 READ D
110 POKE X,D
115 NEXT X
117 REM * STORE MUSIC DATA (at 1580)*
120 FOR X=15800 TO 15800+33
125 READ D
130 POKE X,D
135 NEXT X
138 REM *
140 REM * SET TIMER POINTERS TO *
142 REM * THE SUBROUTINE (1536) *
145 POKE 552,1:POKE 553,6
146 POKE 53761,162
147 REM *
150 X=USR(1536)
155 REM * STOP THE BASIC PROGRAM *
160 POKE 17,0
9990 REM *
9992 REM *
9995 REM * TABLE-DRIVEN SUBROUTINE *
9998 REM *
10000 DATA 104,174,151,58,189,152,58,1
41,0,210,238,151,58,238,151,58,189,153
10010 DATA 58,201,0,208,8,162,0,142,15
1,58,76,4,6,168,162,0,169,2,32,92,228,
96
10090 REM *
10092 REM * MUSIC DATA TABLE *
10094 REM *
10100 DATA 128,40,121,10,108,60,128,10
,144,20,128,10,162,45
10110 DATA 128,10,0,10,128,10,144,20,1
62,10,193,40,128,10,0,10,128,10,144,40

```

Check Data

```

0 REM CHECK DATA FOR AUTOMATIC MUSIC
GENERATOR PROGRAM 1
10 DATA 10922,594,365,757,983,697,369,
600,593,451,536,721,868,777,408,610,72
3,870
135 DATA 8711,779,645,252,107,573,136,
645,24,287,869,708,710,496,716,972,53,
739
10092 DATA 2653,938,743,83,889

```

The Southern Nevada Atari Computer Club Meeting

by Peter Ellison

The first annual meeting for Atari User groups and third party software vendors was held on January 6, 1985, at Sam's Town Hotel and Casino in Las Vegas. It was sponsored by the Southern Nevada Atari Computer Club (SNACC). Thanks to the efforts of the President, Terry Wiszt; the secretary and treasurer, Rick Rowland; and the vice president, Dick Harden; it went off without a hitch.

Over a hundred and thirty people attended, making this gathering a smashing success. Representatives who attended the meeting were the following: Astra Data System, Broderbund Software, ICD, Newell Industries, Microbit Peripheral Products, OSS, and QMI. Opening the meeting was Don Hinze, a member of SNACC, and the program agenda chairman for the evening. Each software representative spoke, giving a brief history of his product and company. Drew Featherson, from Astra Systems, gave a brief demonstration of the new Astra Big D disk drive and gave a brief history on disk drives. William Holt of Broderbund Software gave a short explanation of "Print Shop" and of packaging for software authors. He also gave a short plug for two new games being released. Tom Harker, President of ICD, showed SpartaDos and gave a brief demonstration of the 1050 US Doubler. Wes Newell of Newell Industries spoke of his fast chip products like Ramrod, etc. and gave some history of his company including how and when it was started. Kirk Stockwell from Microbit Peripheral Products presented his product-line of modems. Mark Rose from OSS gave a brief history of this company for which Bill Wilkinson, co-author of Atari Basic, works. Products from OSS included ACTION!, Basic XL, The Writers Tool, plus many more. John DeMar spoke for QMI, telling of the new Q modem. He also gave a brief history of his company and how it has grown over the years.



Mark Rose from OSS.

User groups representatives in Attendance included Alaska Highway Atari User Group, Anchorage Alaska ACE, Los Angeles ACE, S.L.O.POKES, Dallas User Group, San Jose User Group, New York User Group, Salt Lake ACE, San Francisco User Group, and A.B.A.C.U.S. Food and refreshments were provided by SNACC.



Users that attended the meeting.

All the company representatives stayed until the end and answered questions. Everyone enjoyed himself thoroughly, and this, we hope, will become a regular event at every Winter CES in Las Vegas.

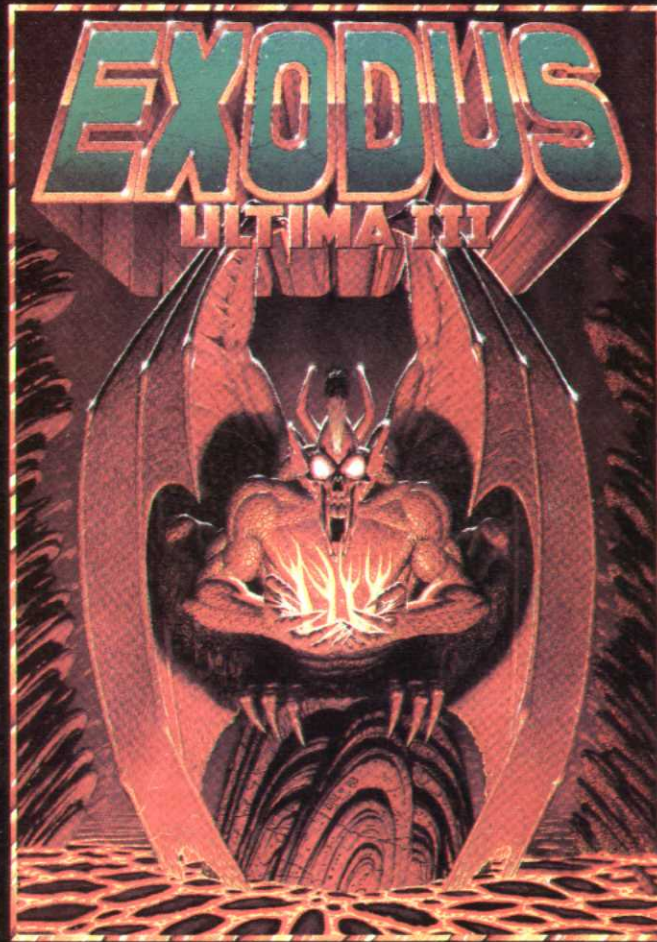
The Southern Nevada Atari Computer Club is four years old. From its early beginnings it has increased from a membership of eight or ten to a registered membership of over seventy-five. Started by the secretary—Rick Rowland, and Don Messenger, this club developed into a great User Group.

New hardware or software is demonstrated at Group meetings, and occasionally speakers are invited to discuss items of particular interest.

Special Interest Groups within the parent group meet on nights other than those of the regular meetings. Included among these are the following: a special assembler learning class given by Dick Harden, an instructor at a local community college; a Telecommunications class given by the BBS Sysop, Steve Philpott, which helps the new modem owner set up his or her modem, and demonstrates how to get the most out of it; a Hardware Special Interest group which covers such things as cold restart or computer repair.

One annual event that takes place with SNACC is a big get-together in August during which there are contests, and games played for hi-scores and prizes. Furthermore, elections are held at this time.

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SNACC Meeting (cont'd)

Each year a representative is sent to the West Coast Computer Fair in San Francisco.

A very large public domain disk library is open to all users. A 1200 Baud BBS system is set up for Atari owners. You can become an associate member for \$12, and, as such, you get Hi-level access plus a newsletter. The phone number is (702) 733-9488. The editor for the newsletter is Ron Orton.

I greatly enjoyed meeting them, finding the members of this Users Group to be both friendly and interesting to talk too.



Terry Wiszt — President of SNACC.



Tom Harker of ICD.



John DeMar of Quantum Systems.

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SPELUNKER BRODERBUND SOFTWARE

Reviewed by Gavin Bamer

n. a person who explores caves as a hobby.

The crude elevator with me on it slowly descends with a whirr into the upper reaches of a massive complex of caves. Within seconds, I push the emergency brake button as I spy a rough, worn cave floor stretching before me into the foreseeable distance. I hop off the elevator in great expectation of what wonders I may find—things which have been seen by only a few hardy, brave souls.

As I walk carefully along the debris strewn natural corridor, the only sound to be heard is the soft melodic clinking and clanking of my exploration equipment. Slowly my carbide helmet light picks out a moving object just ahead. A moment later I come upon a ladder swaying in front of me. I gingerly step on it so that I may lower myself over the looming abrupt cliff to a cave floor twenty feet below.

Back on firm ground, I edge carefully forward. I pocket several flares and sticks of dynamite which I find lying about. Much to my dismay, I come up to a dead-end and have to back-track to a point where I had seen the end of a rope dangling above me.

Before I can reach that spot I hear a blood-curdling tune and see a shimmering white human-like object float towards me. The spelunker legend which I had mocked was true after all. These caves were indeed haunted by phantoms of the dead miners from ages past. Knowing that just one touch from one of these ghouls would kill me, I grab my blaster and pull the trigger. Like a fan blowing away smoke, my blaster slowly dissipates the jeering ghost into the nothingness from which it came.

I continue on my way. Within moments I find myself standing under the rope which I had previously bypassed. Here I stand, trying to gather up enough courage to see where the rope leads. Before I can come to a decision, my blaster begins to whine—an indication that I had better find a replacement battery for it or else I will be blown to smithereens. I jump up, catch hold of the rope and shimmy upwards onto a small, narrow ledge. Today must be my lucky day because right before me lies a battery. I clip it into place and descend back down the rope. There are no other passages in this area, so I make my way to the elevator.

The elevator is right where I left it, so I use it to take me down deeper into the earth. I leave this contraption at a place where a passageway slopes steeply out of sight. On my gradual descent, I walk up to a volcanic vent which is blocking my way. Deadly sulphuric gas is periodically being released, so I must be very cautious. Since there is no other visible means of going around the vent, I carefully jump over it and continue on my way.

I soon come upon a deep chasm which I descend via an old nylon rope. At the bottom sits an old, worn out rail car waiting for someone to take it down the tracks which line the long tunnel. Once in, I slowly chug along, dodging the spots where lethal asbestos vapours drift to the ground. At the end of the tracks stands a ladder leading upwards into the darkness.

Having a lift from the car. I make my way up the ladder to a short tunnel filled with the eerie shrieking of a bat. Knowing that just one bite from the bat would kill me, I tread no further. In a moment of inspiration I release a flare, temporarily blinding the bat. With a quick dash, I am past the cave section where the bat is spinning around in confusion. I sit down on an outcropping to catch my breath and see an object shining in the enveloping darkness. It is a key! Perhaps it unlocks some secret passageway further along in these endless catacombs.

Continuing on my way, I come up to a dead-end. I retrace my footsteps to where I left the bat shrilly guarding its domain. My remaining flare would not light, so I make a run for it—to no avail. "The bat got me!" I exclaim to myself as I drift off to a deep sleep. I awaken at the entrance to the caves, the elevator waiting to lower me down for another attempt at exploring the world of the spelunker.

The object of the game is to lead your man through six levels full of new and unique challenges. Points are scored by collecting along the way various treasures, keys, flares, dynamite, batteries, and extra lives. The extra lives come in handy as one can lose men very easily while jumping ropes, ladders, outcrops, volcanic vents, flowing lava, and so on. Bats, ghosts, the falls, a shaft, a raft trip, and many yawning chasms can also prove to be deadly. The game is thus quite difficult to master, as once one area is conquered, a whole different section of dangers beckons.

The graphics, created by Tim Martin with Micro-Graphic Image, is quite detailed and uses a scrolling system which allows for a rather large playfield. For instance, the first of the six levels consists of twelve screen-fulls of underground caverns. This presents quite a challenge for the player to work through.

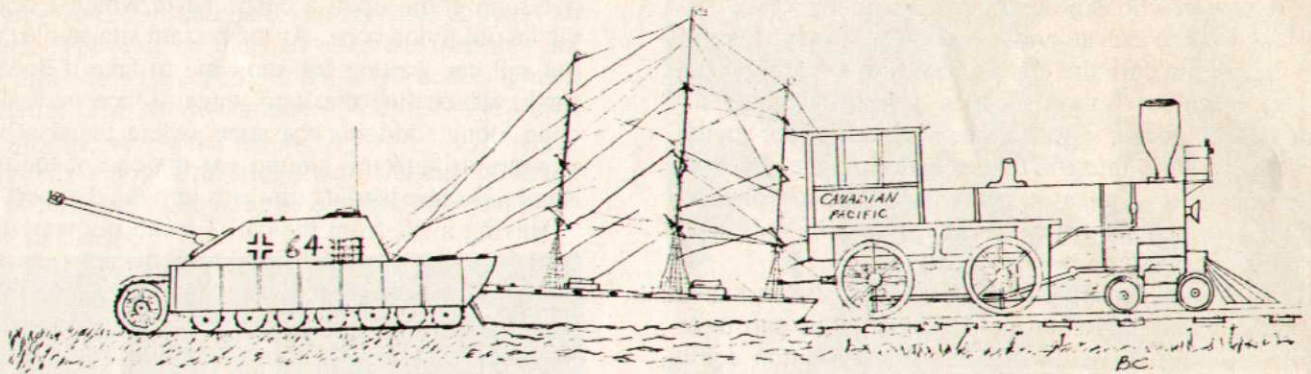
The other facet of Spelunker that is noteworthy is the sound. Each aspect of the game has its own sound, from the elevator noise to the bats; with special commendation going to the very realistic sound of the waterfalls in the third level.

Overall, this is a very enjoyable and original game which is not too complex, yet difficult enough to hold one's interest for an immeasurably long time. Spelunker will definitely be counted as one of the best games of the year.

Cont'd on Page 62

Strategy Zone

by Bob Cockcroft



One of the biggest complaints I hear about strategy games is regarding the lack of informative packaging. In most cases it is impossible for a potential buyer to adequately assess the entertainment value of a product from the container it comes in. It is true that some software stores keep copies so that a brief demonstration can be given; however, a complete understanding of a well designed strategy simulation requires several hours of play. As a result, a short presentation of an involved game is never sufficient. The unavoidable reality is that when a person buys a strategy game, he is forced to risk his money in the hope of getting a quality product.

Professional Blackjack
SCREENPLAY, Inc.

Fortunately, there are some programs like Ken Uston's professional blackjack that take the gambling out of the purchase, and put it in the program. This product is not only a realistic blackjack simulation, but also, one that teaches card counting systems.

Unlike most other Casino games, a skillful blackjack player is able to improve his chances of winning. By keeping a running count of the cards which have been used, one will be better able to predict what cards remain in the deck and to act accordingly. This type of system is called card counting. It has been claimed that some card counting systems can put the odds in favour of the player instead of the House.

In the 'Profession Blackjack' utility, Ken Uston teaches 3 card counting systems which vary in both difficulty and effectiveness. Every method has been statistically analyzed for its return probabilities. In addition, tables for each system are provided that indicate the best move for all possible card combinations. Being colour coded, these tables are a good quick reference source.

The first of the 3 card counting systems Ken Uston teaches is the 'Basic Strategy.' Being the most simple, this method limits its scope to only the cards known by the player. This system gives the statistically correct playing decision if only the players cards and the dealer's 'up-card' are taken into consideration. Depending on the rules of the particular Casino you are in, the 'Basic Strategy' yields anywhere between a fraction of a percent advantage in favour of the player, to a full one percent advantage in favour of the House. I have found the 'Basic Strategy' the most practical method. Its greatest advantages are that it significantly improves the performance of an inexperienced player and is easily applied. My losses were reduced by using a few simple techniques. Unfortunately, this method does not enable a player to consistently make money. Despite teaching the fundamental strategies of Blackjack, it does not give the player an advantage over the House. While I was using this system my money supply never deviated far from the break-even point.

The second system described is the 'Plus/Minus Count.' While the cards are dealt in the game of Blackjack, the odds continually shift back and forth between the player and the House. The 'Plus/Minus Count' uses this fact to the players advantage. By assigning cards particular plus or minus values, a running-count of what remains in the deck can be kept. As a result, a player is able to increase his bets when there is a strong probability of getting a good hand. This system is really a more effective modification of the 'Basic Strategy.' It is claimed that the 'Simple Plus/Minus system' gives the player a small but definite statistical advantage over the House. However, my experience with using it has not been overly successful. After applying the Simple Plus/Minus for a number of times, I have not yet been able to consistently beat the House.

The last, and most effective method is the

'Advance Plus/Minus.' It is claimed that this is a professional level system which is used by many card counters. The Advance Plus/Minus uses many of the same techniques as does the 'Simple Plus/Minus' method. The only significant difference is that the 'running count' is converted into what is called a 'true count.' This is done by comparing the running count with the number of cards remaining in the deck. Although this system does not give the player a decisive advantage over the House, it has been my experience that it does give him a marginal edge. Unfortunately, this method is difficult to master. It requires many hours of practice before a player can apply it effectively.

Ken Uston does a good job of simulating how Blackjack is played in the Casinos. Anywhere from 1 to 7 seven players are allowed at the table. Each player can be controlled by either a human, or by the computer, applying any of the 3 card counting methods. In addition, the players and their strategies can be stored on disk for later use. In order to make the simulation more realistic, the speed in which the computer deals is similar to that of a human dealer. But perhaps one of the most exciting aspects of this game is the ability of a player to choose which particular Casino he wants to play in. The Blackjack rules of every major Casino in the United States are listed on the disk and can be used in your games. Because 'Professional Blackjacks' provides both a tutorial on card counting and a realistic simulation, it is a game that I would recommend to any card player.

Napoleon At Waterloo

'Napoleon at Waterloo' by KRENtek Software, is a recreation of Napoleon's last battle. After escaping from exile on the island of Elba, Napoleon returned to Paris to rebuild his army. He soon found himself being opposed by a coalition which included the British and Prussian Armies. In order to divert the enemy forces away from Paris, Napoleon moved north into Belgium where he engaged the Prussians. After a day of fighting, the Prussians were forced to retreat. Napoleon sent part of his force in pursuit while preparing to fight the British with the remainder of his army. Unknown to Napoleon, the Prussians had escaped their pursuers and were able to circle back to re-enforce the British. As Napoleon, your goal is to defeat the computer controlled Anglo-Prussian forces.

The battle is fought on a moderately sized scrolling map of the city of Waterloo and the surrounding countryside. Buildings, groves of trees, and other features of the landscape are provided as points of reference. French units are given orders through the use of a joystick controlled command box. As a result, com-

plex movement commands can be given quickly. These soldiers are not homogeneous, they vary both in weaponry and quality. In addition, morale is used to modify a unit's ability to fight and carry-out orders.

This game is a simple simulation of Napoleonic warfare. I say simple, not in the negative sense of it having an inadequate presentation, but in the positive sense of it avoiding unnecessary repetition and pointless detail. Because units can be controlled with a minimum of effort by the user, the game has an economic command sequence. Procedural 'fat' like multi-screen displays and the over use of keyboard commands are either eliminated, or kept to an absolute minimum. This efficiency has a two-fold effect. One, with only a small number of commands, this game is quite simple to learn. Two, the absence of useless detail causes the game to progress with more speed and excitement.

'Napoleon at Waterloo' uses a 'real time' combat system. In other words, this game does not use any turn sequence; action is continuous. As a result, the battle will progress with much more realism than would be expected from a board-game equivalent. With a 'real time' system, organizing attacks is of greater significance. Commands must be given to units in order of importance for their attack to be effective. The author of this game has done a good job of coordinating the rate at which the battle progresses with the number of units a player must command. Time is not wasted waiting for units to perform their orders, nor does the battle progress at a pace which renders control over the French forces impossible.

'Napoleon at Waterloo' is a simple but entertaining simulation of Napoleonic warfare. After playing this game a number of times, I have not found any serious weaknesses. My only complaint is that it is sometimes difficult on a green monitor to see in which direction a unit has been ordered to move.

Programmer's Wanted!!

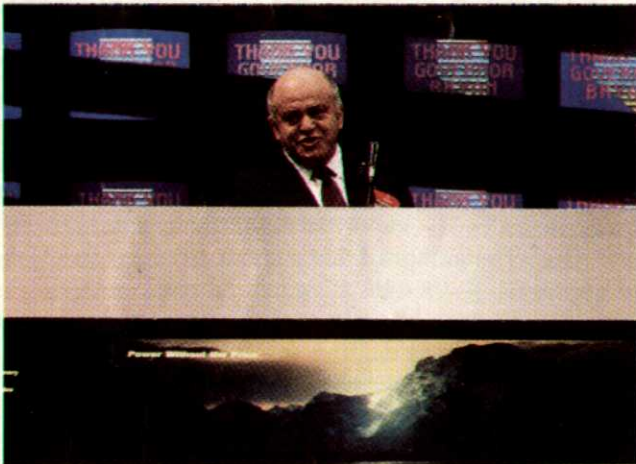
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ATARI AT THE FAIR

by Peter Ellison

The highlight of the Winter Consumers Electronic Show took place on the first morning, January 5, 1985, at the Atari booth where ceremonies were held at which Mr. Jack Tramiel, Chairman of the Board of Atari, Inc., presented his new organization to the Public. This event was opened by Mr. James Copland, Vice President of Marketing, who gave a brief speech describing how Mr. Tramiel started, and stating why he believes Atari will become the number one personal computer company in America. Following this, Mr. Tramiel spoke, explaining that Atari was going to change its image from that of a game company to that of a microcomputer organization. Finally, the Governor of Nevada spoke, stating that Mr. Tramiel hoped



to, one day, open a manufacturing plant in Nevada.

The public interest in Atari was effectively demonstrated by the extremely large crowd that had assembled well before the ceremonies were scheduled to begin. One hour before the opening, it was virtually impossible to move in that area of the hall.

Apart from the ceremony itself, a word must be said about the Atari booth. It, being one of the more attractive and effective displays at the fair, reflected the new spirit of enthusiasm and creative thinking that Mr. Tramiel and his organization have brought to Atari. Of course, the exciting news was of the new line of Atari products that were announced at this time. These consisted of the following: New computers in the 16-Bit category, including the 130ST which will have 128K, and sell for under \$400 U.S., the 260ST which will contain 256K, and sell for under \$500 U.S., and, the top of the line, the 520ST which will have 512K, and sell for under \$600 U.S. (refer to the article on the new 16-bit machines in this issue).

New 8-bit computers include the 65XE which replaces the 800XL, and will continue to sell at under \$120. The 130XE is well under \$200. There is also a

portable 65XEP, including a 3 1/2" disk drive and a very clear 5" green monitor, which has no set price at this time. These computers are all compatible with



Atari's earlier 8-bits. When the polyphonic AMIE sound chip is finished, around March, it's supposed to go into an alternate 64K machine called the 65XEM which will be priced in between the 65XE and the 130XE.

As you can see from the foregoing list, Atari is now a new company with new ideas and new inspiration, promising a brighter future for itself and for everyone using its products.



TREASURE OF THE ANCIENTS

by Bob Cockroft

The sun shone brightly as you reached the rocky crest of a ridge that protruded ominously from the valley floor. Peering into the gully ahead, you realized you had arrived. The destination of months of travel and the final resting place of the treasure of the ancients lay before you. Although only a small crack in the earth was seen, you realized it was the entrance to a labyrinth of unprecedented proportions. Down some dark passage existed the fabled treasure, the last remnant of a long dead civilization.

With renewed energy, you confidently made your way down the rocky slope. The pungent fumes from the sulfur pods spiraled upward, making the air a hot humid soup. As the rocky opening drew closer, you checked your equipment. You were armed with three weapons: dagger, long sword, and short sword. Although all three weapons are useful, they have their own special characteristics. The dagger, being the fastest and more accurate weapon, is most effective against faster moving creatures. Despite its speed, this weapon lacks the damage inflicting power of the other weapons. In contrast, the long sword, being large and clumsy, lacks the speed of a dagger, but inflicts the most damage. The short sword is a compromise between the two other weapons. It lacks the power and clumsiness of the long sword, and the speed and ineffectiveness of a dagger.

Against more powerful creatures it is sometimes best to be defensive, and to hope the monster loses interest and wanders away. Creatures will find it more difficult inflicting damage when you are defending yourself. In more desperate situations, even running away could be a viable option.

The dungeon is quite complex and full of surprises. The maze contains many tunnels and rooms of varying importance. There are traps and invisible forces that block your progress. Secret doors lead to many hidden passages and chambers. Although finding the treasure of the ancients is the goal of this adventure, gold can be found everywhere. Chambers and rooms can have great amounts of treasure, particularly in the deeper sections of the dungeon. In order to keep track of what treasure you have found, press s 'I' to see the inventory.

At the beginning of the game your character is given a rating in strength, dexterity, health, and speed. Strength determines how much damage you inflict on your opponent. Dexterity is used in calculating the probability of hitting. Health determines how quickly you heal your wounds. And hit points repre-

sent the amount of damage you can withstand.

Treasure of the Ancients is the second in a series of graphic adventure games in BASIC. Because of the slow speed of this language, I designed the screens so they could be drawn in the least possible time. As a result, many of the displays lack detail.

```
10 DIM DG(25,25),DDS(20),SD$(10),WDS(1
0),ED$(10),ENS(25),CS(10),REDGS(10),BL
UEGS(10),GOLDGS(10)
20 KP=13:YP=24
30 KC=XP:YC=YP
40 GRAPHICS 1:COLOR 1:SETCOLOR 2,16,1:
POSITION 9,3:?"#6;"THE"
42 POSITION 7,5:?"#6;"treasure"
44 POSITION 3,7:?"#6;"OF THE ANCIENTS"
50 POKE 755,0
60 ? " loading dungeon"
70 FOR Y=1 TO 25:FOR X=1 TO 25:READ D:
DG(X,Y)=D:NEXT X:NEXT Y
90 IF DG(XC,YC)=0.4 THEN DDS="Silver 1
ines path":GOTO 910
100 PSTR=INT(RND(0)*6)+1+INT(RND(0)*6)
+1+INT(RND(0)*6)+1
110 PDEX=INT(RND(0)*6)+1+INT(RND(0)*6)
+1+INT(RND(0)*6)+1
120 PSP=INT(RND(0)*6)+1+INT(RND(0)*6)+
1+INT(RND(0)*6)+1
130 PHP=INT(RND(0)*6)+1+INT(RND(0)*6)+
1+INT(RND(0)*6)+1
140 PCO=INT(RND(0)*6)+1+INT(RND(0)*6)+
INT(RND(0)*6)+1
150 IF PHP<6 THEN PHP=5
160 REDGS="" ":BLUEGS=""
":GOLDGS="" "
170 GRAPHICS 0
180 POKE 755,0
190 ? :? " PLAYER'S CHARACTERISTIC
S"
200 ? :?
210 ? " STRENGTH: ":PSTR
220 ? " DEXTERITY: ":PDEX
230 ? " HEALTH: ":PCO
240 ? " SPEED: ":PSP
250 ? " HIT POINTS: ":PHP
260 ? :? :? " Press the SPACE BAR to
continue"
270 POKE 53279,0
280 IF PEEK(764)<>33 THEN 280
290 REM MAIN LOOP
300 ST=STICK(0):XC=XP:YC=YP
310 POKE 753,0
320 IF DG(XC,YC)=1 THEN DDS="Hall":GOT
O 1410
330 IF DG(XC,YC)<1 THEN DDS="Tunnel":G
OTO 910
340 IF DG(XC,YC)=10 THEN DDS="Door":GO
TO 1450
350 IF DG(XC,YC)=0.7 THEN DDS="Gold ha
llway":GOTO 910
360 IF DG(XC,YC)=11 THEN DDS="Gold doo
r":GOTO 1450
370 IF DG(XC,YC)=0.4 THEN DDS="Silver
lines path":GOTO 910
380 IF DG(XC,YC)=2 THEN DDS="Silver wa
ll":GOTO 1410
390 IF DG(XC,YC)=40.5 THEN DDS="Small
room":FP=INT(RND(0)*30)+1:GOTO 1290
400 IF DG(XC,YC)=41 THEN DDS="Long Roo
m":FP=INT(RND(0)*125)+1:GOTO 1290
410 IF DG(XC,YC)=3 THEN DDS="Mosaic wa
lls":GOTO 1450
420 IF DG(XC,YC)=23 THEN DDS="You have
found about 500 gps":FP=INT(RND(0)*10
00)+1:GOTO 1290
430 IF DG(XC,YC)=43 THEN DDS="Misty Ro
om":FP=INT(RND(0)*1000)+1:GOTO 1290
440 IF DG(XC,YC)=44 THEN DDS="Silent R
oom":FP=INT(RND(0)*200)+1:GOTO 1290
450 IF DG(XC,YC)=45 THEN DDS="Room of
green hue":FP=INT(RND(0)*150)+1:CA=12:
```

```

CB=6:GOTO 1290
460 IF DG(XC,YC)=46 THEN DDS="Dark roo
M":FP=INT(RND(0)*1250)+1:CA=10:CB=1:GO
TO 1290
470 IF DG(XC,YC)=47 THEN DDS="Bright r
oom":FP=INT(RND(0)*800)+1:CA=2:CB=9:GOT
O 1290
480 IF DG(XC,YC)=48 THEN DDS="Windy ro
om":FP=INT(RND(0)*110)+1:CA=5:CB=5:GOT
O 1290
490 IF DG(XC,YC)=49 THEN DDS="Room of
Armour":FP=INT(RND(0)*580)+1:CA=12:CB=
6:GOTO 1290
500 IF DG(XC,YC)=49.2 THEN DDS="Room o
f Brass":FP=INT(RND(0)*500)+1:CA=4:CB=
6:GOTO 1290
510 IF DG(XC,YC)=49.3 THEN DDS="Room o
f Copper":FP=INT(RND(0)*1000)+1:CA=15:
CB=4:GOTO 1290
520 IF DG(XC,YC)=49.4 THEN DDS="Room o
f Silver":FP=INT(RND(0)*1750)+1:CA=16:
CB=6:GOTO 1290
530 IF DG(XC,YC)=49.5 THEN DDS="Room o
f Gold":FP=INT(RND(0)*2750)+1:CA=3:CB=
6:GOTO 1290
540 IF DG(XC,YC)=49.6 THEN DDS="Room o
f Platinum":FP=INT(RND(0)*4000)+1:CA=9
:CB=9:GOTO 1290
550 IF DG(XC,YC)=80 THEN FP=INT(RND(0)
*5000)+1:DDS="Red gem room":CA=5:CB=1:
GOTO 1120
560 IF DG(XC,YC)=82 THEN FP=INT(RND(0)
*6000)+1:DDS="Blue gem room":CA=9:CB=1
:GOTO 1120
570 IF DG(XC,YC)=84 THEN FP=INT(RND(0)
*7000)+1:DDS="Gold gem room":CA=2:CB=1
:GOTO 1120
580 IF DG(XC,YC)=86 THEN FP=INT(RND(0)
*8000)+1:DDS="TREASURE OF THE ANCIENTS
":GOTO 750
590 REM *
600 REM * LEFT SIDE *
610 IF DG(XC-1,YC)<1 THEN 1010
620 IF DG(XC-1,YC)>9.9 AND DG(XC-1,YC)
<20 THEN 1010
630 IF DG(XC-1,YC)=0.4 THEN 1010
640 IF DG(XC-1,YC)=0.7 THEN 1010
650 REM *
660 REM * RIGHT SIDE *
670 IF DG(XC+1,YC)<1 THEN 1060
680 IF DG(XC+1,YC)>9.9 AND DG(XC+1,YC)
<20 THEN 1060
690 IF DG(XC+1,YC)=0.4 THEN 1060
700 IF DG(XC+1,YC)=0.7 THEN 1060
710 GOTO 1500
720 REM MOVEMENT SECTION
730 REM *
740 REM * WHITE GEM ROOM *
750 GRAPHICS 8:COLOR 1:SETCOLOR 2,24,1
5
760 POKE 755,0
770 PLOT 1,1:DRAWTO 40,40:DRAWTO 200,4
0:DRAWTO 319,1
780 PLOT 40,40:DRAWTO 40,120:DRAWTO 20
0,120:DRAWTO 200,40
790 COLOR 0:PLOT 154,120:DRAWTO 163,12
0:COLOR 1
800 PLOT 40,120:DRAWTO 1,150:PLOT 200,
120:DRAWTO 319,150
810 POKE 755,1
820 PLOT 145,145:DRAWTO 158,152:DRAWTO
170,145:DRAWTO 160,110:DRAWTO 156,110
:DRAWTO 145,145
830 PLOT 158,152:DRAWTO 158,110:PLOT 1
56,110:DRAWTO 156,105:DRAWTO 160,105:D
RAWTO 160,110
840 PLOT 156,110:DRAWTO 160,105:PLOT 1
60,110:DRAWTO 156,105
850 PLOT 158,105:DRAWTO 158,96:PLOT 16
0,103:DRAWTO 160,98:PLOT 162,101:DRANT
O 162,100
860 PLOT 156,103:DRAWTO 156,98:PLOT 15
4,101:DRAWTO 154,101:DRAWTO 154,100
870 ? " THE WHITE GEM (you win)"
880 GOTO 880
890 REM *
900 REM * FLOOR PICTURE *
910 GRAPHICS 8:COLOR 1:SETCOLOR 2,16,1
:POKE 755,0
920 PLOT 1,1:DRAWTO 130,55:DRAWTO 200,
55:DRAWTO 319,1
930 PLOT 130,100:DRAWTO 1,150:PLOT 200
,100:DRAWTO 319,150
940 PLOT 130,55:DRAWTO 130,100:DRAWTO
200,100:DRAWTO 200,55

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950 PLOT 130,55:DRAWTO 142,60:PLOT 200
,55:DRAWTO 195,57:PLOT 130,100:DRAWTO
145,94:PLOT 200,100:DRAWTO 190,94
960 PLOT 65,28:DRAWTO 260,28:DRAWTO 26
0,126:DRAWTO 65,126:DRAWTO 65,28
970 ? " ";DDS
980 GOTO 610
990 REM *
1000 REM * WAY TO THE LEFT *
1010 PLOT 60,129:DRAWTO 60,45:DRAWTO 2
8,33:DRAWTO 28,138
1020 PLOT 60,45:DRAWTO 28,45:PLOT 60,1
28:DRAWTO 28,120
1030 GOTO 670
1040 REM *
1050 REM * WAY TO THE RIGHT
1060 PLOT 270,129:DRAWTO 270,45:DRAWTO
302,33:DRAWTO 302,142
1070 PLOT 270,45:DRAWTO 302,45:PLOT 30
2,126:DRAWTO 270,126
1080 GOTO 1500
1090 REM *
1100 REM * GEM ROOMS *
1110 REM *
1120 GRAPHICS 8:SETCOLOR 2,CA,CB:POKE
755,0
1130 PLOT 1,1:DRAWTO 40,40:DRAWTO 200,
40:DRAWTO 319,1
1140 PLOT 40,40:DRAWTO 40,120:DRAWTO 2
00,120:DRAWTO 200,40
1150 COLOR 0:PLOT 146,120:DRAWTO 169,1
20:COLOR 1
1160 PLOT 40,120:DRAWTO 1,150:PLOT 200
,120:DRAWTO 319,150
1170 POKE 755,1
1180 PLOT 135,145:DRAWTO 158,155:DRAWTO
0 180,145:DRAWTO 168,115:DRAWTO 158,12
0:DRAWTO 148,114:DRAWTO 135,145
1190 PLOT 158,120:DRAWTO 158,155
1200 PLOT 158,116:DRAWTO 153,114:DRANT
O 156,110:DRAWTO 158,110:DRAWTO 158,11
6:DRAWTO 163,114
1210 DRAWTO 161,110:DRAWTO 158,110:PLO
T 149,114:DRAWTO 158,111:PLOT 167,114:
DRAWTO 158,111
1220 PLOT 158,110:DRAWTO 158,105:PLOT
159,110:DRAWTO 159,106:PLOT 160,110:DR
AWTO 160,107
1230 PLOT 161,108:DRAWTO 161,109
1240 PLOT 157,110:DRAWTO 157,106:DRANT
O 156,110:DRAWTO 156,107:DRAWTO 155,11
0:DRAWTO 155,108
1245 GP=GP+FP
1250 ? DDS;" ";FP;" gold pieces"
1260 IF DG(XC,YC)=86 THEN END
1265 GOTO 1500
1270 REM *
1280 REM * ROOM *
1290 GRAPHICS 8:SETCOLOR 2,CA,CB:PLOT
1,1:DRAWTO 65,28:DRAWTO 260,28:DRAWTO
319,1:POKE 755,0
1300 PLOT 65,126:DRAWTO 1,150:PLOT 260
,126:DRAWTO 319,150
1310 PLOT 65,28:DRAWTO 65,126:DRAWTO 2
60,126:DRAWTO 260,28
1320 GP=GP+FP
1330 ? DDS;" ";FP;" gold pieces"
1340 GOTO 610
1350 REM *
1360 REM * FRONT DOOR *
1370 PLOT 148,126:DRAWTO 155,120:PLOT
148,52:DRAWTO 154,56:PLOT 190,52:DRANT
O 180,60:PLOT 190,126:DRAWTO 185,120
1380 GOTO 1500
1390 REM *
1400 REM * WALL CLOSE UP *
1410 GRAPHICS 8:SETCOLOR 2,16,1:FOR Y=
1 TO 120 STEP 10:PLOT 1,Y:DRAWTO 319,Y
:NEXT Y:POKE 755,0
1420 FOR X=1 TO 319 STEP 25:PLOT X,1:D
RAWTO X,110:NEXT X:? "There is a wall
in this direction"
1430 GOTO 1500
1440 REM *
1450 REM * DOOR CLOSE UP *
1460 GRAPHICS 8:SETCOLOR 2,16,1:PLOT 1
,1:DRAWTO 319,1:DRAWTO 319,150:DRAWTO
1,150:DRAWTO 1,1:POKE 755,0
1470 PLOT 125,150:DRAWTO 125,40:DRAWTO
195,40:DRAWTO 195,150
1480 ? " ";DDS
1490 GOTO 1500
1500 REM *
1510 REM * ENCOUNTER SECTION *
1520 PE=INT(RND(0)*10)+1

```



```

1530 IF PE<>1 THEN 1570
1540 GOTO 1680
1550 REM *
1560 REM * MOVEMENT SECTION *
1570 ST=STICK(0):IF ST=14 THEN IF DG(XP
P,YP-1)>3 OR DG(XP,YP-1)<0.99 THEN YP=
YP-1:GOTO 300
1580 IF ST=14 AND DG(XP,YP-1)<4 AND DG
(XP,YP-1)>0.99 THEN 1410
1590 IF ST=13 THEN IF DG(XP,YP+1)>3 OR
DG(XP,YP+1)<0.99 THEN YP=YP+1:GOTO 30
0
1600 IF ST=13 AND DG(XP,YP+1)<4 AND DG
(XP,YP+1)>0.99 THEN 1410
1610 IF ST=11 THEN IF DG(XP-1,YP)>3 OR
DG(XP-1,YP)<0.99 THEN XP=XP-1:GOTO 30
0
1620 IF ST=11 AND DG(XP-1,YP)<4 AND DG
(XP-1,YP)>0.99 THEN 1410
1630 IF ST=7 THEN IF DG(XP+1,YP)>3 OR
DG(XP+1,YP)<0.99 THEN XP=XP+1:GOTO 300
1640 IF PEEK(764)=13 THEN 2780
1650 GOTO 1570
1660 REM *
1670 REM * ENCOUNTER SECTION *
1680 TE=INT(RND(0)*90)+1
1690 B=INT(RND(0)*PC0)-11:IF B<0 THEN
B=0
1700 HP=HP+1+B
1710 IF HP>PHP THEN HP=PHP
1720 ENFLAG=1
1730 IF TE<5 THEN ENS="GIANT RAT":HP=8
3:AC=1:DA=6:DE=12:SP=15:RU=2:GOTO 1920
1740 IF TE<6 THEN ENS="CAVE BEAR":HP=1
5:AC=3:DE=5:SP=5:RU=12:GOTO 1920
1750 IF TE<7 THEN ENS="BLACK BEAR":HP=
7:AC=2:DE=6:SP=7:RU=5:GOTO 1920
1760 IF TE<9 THEN ENS="SMALL SNAKE":HP
=3:AC=1:DE=9:SP=10:RU=7:GOTO 1920
1770 IF TE<12 THEN ENS="BANDIT":HP=7:A
C=1:DE=7:SP=7:RU=5:GOTO 1920
1780 IF TE<14 THEN ENS="GAINT SCORPION
":HP=5:AC=3:DA=6:CL=1:DE=8:SP=8:RU=4:G
OTO 1920
1790 IF TE<17 THEN ENS="BERSERKER":HP=
7:AC=0:DA=5:DE=5:SP=12:RU=100:GOTO 192
0
1800 IF TE<20 THEN ENS="ZOMBIE":HP=10:
AC=0:DA=5:DE=3:SP=4:RU=50:GOTO 1920
1810 IF TE<21 THEN ENS="GHOUL":HP=12:A
C=5:DA=12:DE=10:SP=12:RU=10:GOTO 1920
1820 IF TE<23 THEN ENS="GOLEM":HP=15:A
C=4:DA=10:DE=5:SP=4:RU=8:GOTO 1920
1830 IF TE<27 THEN ENS="GIANT BAT":HP=
5:AC=1:DA=4:DE=12:SP=15:RU=2:GOTO 1920
1840 IF TE<30 THEN ENS="GIANT FROG":HP
=8:AC=1:DA=3:DE=2:SP=8:RU=5:GOTO 1920
1850 IF TE<50 THEN ENS="RAT":HP=3:AC=1
:DA=3:DE=7:SP=5:RU=4:GOTO 1920
1860 IF TE<60 THEN ENS="SKELETION":HP=
10:AC=1:DA=6:CL=2:DE=11:SP=11:RU=6:GOT
O 1920
1870 IF TE<65 THEN ENS="MUMMY":HP=12:A
C=1:DA=4:CL=3:DE=5:SP=9:RU=8:GOTO 1920
1880 IF TE<70 THEN ENS="LIZARD MAN":HP
=15:AC=3:DA=6:CL=4:DE=12:SP=12:RU=5:GO
TO 1920
1890 IF TE<71 THEN ENS="WERE WOLF":HP=
24:AC=3:DA=10:CL=5:DE=14:SP=17:RU=25:G
OTO 1920
1900 IF TE<75 THEN ENS="ORGRE":HP=18:A
C=1:DA=10:CL=6:DE=8:SP=9:RU=7:GOTO 192
0
1910 IF TE<90 THEN ENS="ORC":HP=5:AC=2
:DA=4:CL=7:DE=6:SP=6:RU=3:GOTO 1920
1920 GRAPHICS 0:?:?:?:? " You have
encountered a ";ENS;POKE 755,0
1930 ? :? " Press SPACE BAR to continu
e":POKE 764,255
1940 IF PEEK(764)=33 THEN POKE 764,255
:GOTO 1990
1950 GOTO 1940
1960 REM *
1970 REM * COMBAT SECTION *
1980 REM *
1990 GRAPHICS 0:?:? " Combat
Options":POKE 755,0
2000 ? :? "What do you want to do?"
2010 ?
2020 ? " Attack with long sword (p
ress L)"
2030 ? " Attack with short sword (p
ress S)"
2040 ? " Attack with dagger (p
ress G)"

```

```

2050 ? :? " Defend
(Press D)"
2060 ? " Run (p
ress R)"
2070 ? " Inventory (p
ress I)":?
2080 POKE 753,0
2090 POSITION 2,12:?" ":POSI
TION 2,13:?" "
":POSITION 2,14:?" "
"
2100 POSITION 2,15:?" "
":POSITION 2,16:?" "
"
2110 POSITION 2,18:?" "
":POSITION 2,17:?" "
"
2120 POKE 764,255:POSITION 2,12:POKE 7
55,3:INPUT C$:POKE 755,0
2130 IF C$="L" THEN CD=16:CDE=-5:GOTO
2260
2140 IF C$="S" THEN CD=8:CDE=-2:GOTO 2
260
2150 IF C$="G" THEN CD=4:CDE=2:GOTO 22
60
2160 IF C$="D" THEN CDE=4:GOTO 2440
2170 IF C$="I" THEN IN=1:GOTO 2780
2180 IF C$="R" THEN CDE=-1:GOTO 2690
2190 POSITION 2,14:?"Sorry, I did not
understand"
2200 FOR X=1 TO 50:NEXT X
2210 C$=" "
2220 POSITION 2,14:?" "
":GOTO 2090
2230 REM *
2240 REM * ATTACK SECTION *
2250 REM *
2260 PH=INT(RND(0)*20)+1
2270 PH=PH+(PDEX-11)+((DE*-1)+11)+CDE
2280 IF PH>12 THEN 2310
2290 ? "You missed"
2300 GOTO 2500
2310 ? "You hit"
2320 DAMAGE=INT(RND(0)*CD)+1+INT(PSTR/
2)-5
2330 HP=HP-DAMAGE
2340 IF HP<3 AND HP>0 THEN ? "The enco
unter is weak"
2350 IF HP>-1 THEN 2410
2360 ? "The encounter is dead"
2370 NMK=NMK+1:PHP=PHP+1
2380 ? :? "press SPACE BAR to continue
"
2390 IF PEEK(764)=33 THEN 320
2400 GOTO 2390
2410 GOTO 2500
2420 REM *
2430 REM * DEFEND SECTION *
2440 RU1=INT(RND(0)*RU)+1
2450 IF RU1<>1 THEN 2500
2460 ? "The encounter ran away"
2470 ? :? "press the SPACE BAR to cont
inue"
2480 IF PEEK(764)=33 THEN 320
2490 GOTO 2480
2500 PHE=INT(RND(0)*20)+1
2510 PHE=PHE+(DE-11)+((PDEX*-1)+11)
2520 IF PHE>10 THEN 2570
2530 ? "The encounter missed"
2540 ? :? "press SPACE BAR to continue
"
2550 IF PEEK(764)=33 THEN 2090
2560 GOTO 2550
2570 DAE=INT(RND(0)*DA)+1
2580 ? "The encounter hit you"
2590 PHP=PHP-DAE
2600 IF PHP<0 THEN 2650
2610 ? "You now have ";PHP;" hit point
s"
2620 ? :? "Press SPACE BAR to continue
"
2630 IF PEEK(764)=33 THEN 2650
2640 GOTO 2630
2650 IF PHP<0 THEN ? :? "You are dead"
:END
2660 GOTO 2090
2670 REM *
2680 REM * THE RUN AWAY SECTION *
2690 CH0A=INT(RND(0)*20)+1
2700 CH0A=CH0A+(SP5-11)+((SP*-1)+11)
2710 IF CH0A>10 THEN 3530
2720 ? "You have successfully escaped"
2730 ? :? "Press SPAUE BAR to continue
"
2740 IF PEEK(764)=33 THEN 320

```


JAKE THE SOFTWARE DUDE

by Jason Cockroft

Stepping into the office one morning, I was informed that I was to cover the Consumer Electronics Show (CES) in Las Vegas. The concerned looking editor handed me a list of instructions and reminded me that I would be there 'on business.'

It was past midnight before I got into that 'well-lit' town. I've heard a bunch about this place — a lot of 3 piece suits, carnations, expensive cars, and pretty faces. The town wasn't too bad though, even if the people were kinda weird. To give you an example,



when I talked to the Gals at the rent-a-car they told me they were right out of '67 stratochiefs' and '69 Ramblers.' Imagine that! Instead, they gave me something they called a 'cute little Honda.' Don't get me wrong, I like lowriders, but this was a different bag of tricks. The wheels were the size of a frisbee. It had the power of my mother's sewing machine while that little heap was no bigger than the size of my TV set. This baby was like a deep freeze on wheels!

Yet, these funny things didn't stop there! When I pulled up to the Hotel, some jumpy guy, decked out in a red jacket and white pants came running over to my car. He told me he would park the heap. Grabbing him by the nose, I pulled his head down into the car and simply told him I was quite capable of parking my own car. He told me he was a valet; I told him I was J.S.D. and did not speak a foreign tongue. Yet, when I agreed to let him park that embarrassing tin can, he gave me some sort of ticket. It was dark out; I couldn't read it, nor did I want to. I threw it out.

Finally, when I was at the front desk, another sporty looking flake picked up my bags.

"What are you doing Mac?" I questioned.

"Taking your bags to your room, sir," he

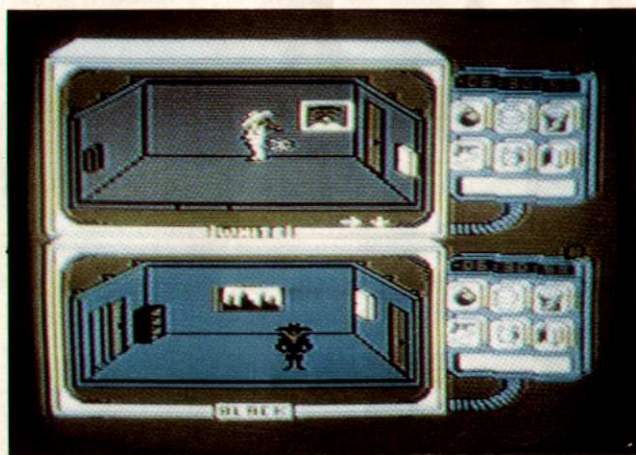
responded.

"Oh, that's what I like to hear, OK then" I said.

Yet, when I got up to my room he started acting really uptight. He just stood there as if he were waiting for something. I guess he was kinda slow. I told him to check to see if my car was doing alright. He flipped out! Hey! I'm pretty easy going, but this Hotel wasn't rubbing me the right way. I couldn't be bothered with the heap either, so I caught a cab to the other end of town and checked in.

The following morning, I was down to business. I opened the envelope that the editor gave me to find several credit cards and instructions for my Vegas assignment. It said that I had to set up the ROM booth, the dinner, and the press conference according to the budget outlined. Suddenly, a brilliant plan hit me: if I could just rub the casino, just the right way, I could get some extra bucks, put on a super dinner and stuff, and get my long overdue promotion. Hey! I thought of this one all by myself!

After a quick cruise around the casino, I realized poker was the game. But yah know since the ATARI's been on the street, my poker game has gone down the drain. I figured the only way to make a comeback was to go for the bluff. I went to the cashier and charged the ROM credit card to the tilt.



With a tray full of chips (poker), I sat down at a table. A half hour later, I looked down at the tray and noticed it was half-empty. As I looked around, I realized my chips were at the other end of the table with some dudes in dark shades.

"What's your John Doe?" I questioned.

"State-Side Freddy," he chuckled. "I Finally got to meet the legendary J.S.D." he added.

JSD (cont'd)

I was really surprised he recognized me, for I was a long way from home. To tell you the truth, I never heard of this Freddy guy before. I asked the dude to my right who he was. He told me he was 'the greatest gamer this side of the great divide.' To tell you the truth, I've never heard of that river and really didn't care for this Freddy Dude either. I gave my own chuckle.

Just then the waitress interrupted the game and asked if I wanted a drink or something.

"A couple of cheeseburgers and a Coke!," I responded. Once again I got one of those funny looks.

"So, Software Dud, it looks like you've met your match!" boasted Freddy.

Looking over, I realized Stateside Freddy had half of my chips. This made him half owner of ROM.

"How 'bout a little double or nothing?" he added.

I couldn't back out of this one — I was in a hole — I had to get out.

"OK Freddy, but I choose the game."

For the first time, I saw him pull down his shades as he gave a quiet "you're on."

Just then the waitress returned with the cheeseburgers.

I didn't know what to say. I responded with a "HEY sweetie, what's your name?"

"Jill"

"OK Jill, I'll remember that," I said, as I got up from the table. "I'll be in touch State-Side," I stated.

"Where're you staying?," he asked.

"Motel 9."

I heard that fiendish laugh once again.

As I was walking out the door, I heard a voice telling me to wait up. I turned and noticed Jill running over to the exit. She offered me a ride. I couldn't refuse.

Once back at the motel, she asked me how I was going to get even. I pulled out of my duffel bag a MAD magazine and tossed it over to her.

"It's all in there" I told her as I was setting up the ol' 800. She started to laugh. "You ever read the cartoon Spy vs Spy?" I continued.

"Yah, of course, but I don't understand" she responded.

Just then I loaded in the video game 'Spy vs Spy.' I looked over and noticed her eyes light up.

The basic goal of the game is to search a multi-story house (depending on the skill level) to find different clues and artifacts faster than the other spy. While doing this you may set different traps for the other spy, or even fight him to the death. Sounds easy eh?

Well, not really. To start with, the house (on upper skill levels) is huge. There is a multitude of different traps. Bombs and spring traps are some, just to name a few. But what makes this game completely crazy is

that it's on a split screen. Top half is White spy; bottom half, Black spy. Believe me, this game's playability is as mad as the cartoon.

On top of that, Mike Riedel and Jim Nangano, (the creators) really went to town on the games presentation. Before I'll get to the graphics, let me tell you it plays this super little tune that ranks up there with the ROAD RUNNER cartoons for all-time exciting music. As for the graphics, I'd say they're better than the comic strip! Like a, late in the eve'n if I'm kinda fade'n, I'm not sure what I'm a watch'n (excuse'M for the poetry), a cartoon or a video game. It's that good. What can I say? Hey! I recommend it!

"So this is how you're going to do it?" Jill questioned.

"A game I like, I simply don't lose it," I bragged. Jill gave a controlled laugh.

The next day Jill arranged the rematch. It was to be at the Cheezer's Palace, played on a huge movie screen in front of a crowd of thousands. Clearly my reputation was on the line.

As I walked into the theater and down the aisle, I was greeted by this great crowd. I could barely move. They must have had a lot of money on me or something, I couldn't really figure it. They started chanting "J.S.D., J.S.D..." I guess things were a little out of hand. When I finally made it, I saw State-Side quietly waiting. Quickly, the M.C. introduced us, as he handed us each a J-stick. "May the best man win!" he added. The crowd cheered. Just then I heard the START button go 'click' It had begun.

I could tell the crowd was overly excited as they screamed when I almost fell for some of the traps. Little did they know I was in full control. I noticed beads of sweat forming on Freddy's forehead, as he was in a complete state of panic. To tell you the truth, I was just playing with him so the crowd could get their money's worth. This guy was not even near a pro. I gave my own little chuckle and put that poor boy under. The crowd went nuts!

Suddenly I remembered I had to meet the editor at the airport at 6:00 pm. I had 5 minutes to spare. Sneaking out the back exit, I ran over to the hotel where that 'cute little Honda' was parked, and found that sporty looking wimp. He tossed me the keys, and I flew out to the airport, arriving only 5 minutes late! (I would have made it in a V-8). Anyways, I picked up the editor and headed back into town.

"So JSD," the editor started, "What a cute little car you picked out! You are finally starting to show some taste."

I was thinking about asking for a raise — obviously not a time to start an argument. Instead, I told him that since I had checked in across town, he had a hotel room to himself. He seemed most pleased.

"Well Jake, have you arranged for the ROM dinner

Cont'd on Page 62

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Directory:   MAIN

COPY        COM      262    7-17-84    10:35a
FORMAT      COM     8158    7-17-84    10:27a
RS232       COM      127    7-11-84    10:22a
STARTUP     BAT        19    7-11-84    10:15a
SET         COM      831    7-11-84     9:48a
UNERASE     COM     1419    7-11-84     9:53a
SPCOPY     COM     4654    7-16-84     1:47p
DUPDSK     COM     1420    7-16-84     4:14p
TIME       COM     1182    7-11-84     9:46a
SUBDIR     COM      <DIR>    7-20-84     4:16p
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JSD (cont'd)

party tonight?" he asked.

"FRACK! I mean sure." I replied.

I new I was in a mess now. I had to think fast. After parking the heap, I ran over to the casino and told Jill my problem. We came up with a great plan.

Jill and I picked up the Honda and spun over to the restaurant where she bought the cheeseburgers. I told the chef the problem I was in, and he agreed to help. We made cheeseburgers on the fly. We filled up the Honda, and towed it over to Cheezers Palace. The crowd was bananas as ever. We started chucking cheeseburgers everywhere. It broke into a full scale riot. Jill went to fetch the editor. This was a dinner party he would never forget! (or forgive)

Obviously, I didn't get my raise.

Ratings

Playability: 10
Graphics: 10
Sound: 9.8

Overall Rating: 9.8

WCES (cont'd)

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The talk at the fair was of Atari and, as you can see from the above article, there was a lot of software to go with its new computers.

Spelunker (cont'd)

Broderbund Software, Inc.
17 Paul Drive
San Rafael, CA 94903

Ratings
Graphics: 10
Sound: 10
Documentation: 9
Challenge: 10
Holds Interest: 10
Overall Rating: 9.8

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